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# Getting Beyond Religion as Science: "Unstifling" Worldview Formation in American Public Education

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# Getting Beyond Religion as Science: "Unstifling" Worldview Formation in American Public Education

Barry P. McDonald\*

#### Abstract

Since ancient times. Western civilization has witnessed a great debate over a simple but profound question: From whence did we come? Two major worldviews have dominated that debate: a theistic worldview holding that we, and the world in which we live, are the purposeful product of a supernatural creator; and a materialistic worldview holding that we are the product of unintelligent and random natural forces. This debate rose to the fore with Darwin's publication of his theory of evolution and the development of the modern scientific establishment. In America, it initially took its most conspicuous form in efforts by creationists to ban the teaching of evolution in American public schools, and then to have creationism taught as science. After legal setbacks based on the Establishment Clause of the First Amendment, that effort morphed into the intelligent design movement of the past couple of decades. That movement's aim to gain a place in the science curriculum recently stalled with a court ruling that it was, like the creationists before it, attempting to teach religious concepts as science. Most recently, a notable group of scientists and atheists have reversed the trend of defending science against religious attacks and launched a very public and aggressive campaign against religion itself. Prominent scientists and other believers have responded with works attempting to reconcile science and faith.

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This Article proposes a solution to the "religion as science" wars in American public schools, as well as to the failure of those schools not only to prepare American youths to understand and participate in this vital debate, but also to make informed and thoughtful decisions regarding their own worldviews. Due to confusion about applicable Establishment Clause law or otherwise, most public schools fail to educate students about the important role of religion in our society, including religious perspectives on the most fundamental question regarding our existence—the nature of our origins. The solution proposed herein is one that some, including presidential candidates, have suggested, but no one has articulated how and whether it can be legally done: Teaching a basic philosophy of origins course that is geared to upper level high school students that teaches and explores various origins accounts from both scientific and religious perspectives.

This Article suggests the contours of such a course and explains how one could be offered consistent with First Amendment requirements. By examining this subject utilizing the time-honored discipline of philosophical analysis, which not only considers the empirical evidence properly demanded by science but other sources of human knowledge as well, American youth would be better prepared to take part in this dialogue and to appreciate the perspectives of others. It is also hoped that such an approach would relieve much of the pressure placed on the science curriculum by those religious citizens who view it, and the generally secular agenda of public education, as promoting a worldview at odds with their most deeplyheld convictions.

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A little philosophy inclineth man's mind to atheism, but depth in philosophy bringeth men's minds about to religion.

Sir Francis Bacon ("father" of modern science)

In the long run nothing can withstand reason and experience, and the contradiction religion offers to both is only too palpable.

Sigmund Freud (Twentieth century psychiatrist)

#### I. Introduction

Are we the product of purposeful creation or impersonal natural forces? This BIG QUESTION about our existence is easy to ask, but hardly easy to answer—at least with any degree of consensus. In fact, this simple question is turning out to be one of the most divisive and intractable in the modern age. To an increasing degree it has underlain the major legal battles between science and religion in America<sup>1</sup> and is rapidly becoming a centerpiece of our current "culture wars"—so much, indeed, that U.S. presidential candidates were

<sup>1.</sup> See, e.g., David Ray Griffin, Process Philosophy and Theology, in THE HISTORY OF SCIENCE AND RELIGION IN THE WESTERN TRADITION 214, 214 (Gary B. Ferngren et al. eds., 2000) (explaining that the conflict between naturalistic and theistic worldviews lies behind much of the conflict between science and religionists who read the Bible literally).

queried about this issue in a major debate of the 2008 race with their responses receiving more press than their policy positions.<sup>2</sup>

Charles Darwin effectively (and somewhat reticently)<sup>3</sup> injected this question into the public consciousness in the latter half of the nineteenth century, because before he published his evolutionary theory Western civilization largely assumed that God purposively created our world and its inhabitants.<sup>4</sup> Darwin's theory of natural selection and the evolution of species, however, suddenly presented what many viewed as an alternative materialistic explanation for the origins of human life.<sup>5</sup> This view was by no means dictated by Darwin's theory, however, and many theologians of the late-nineteenth and early-twentieth centuries argued that the concepts of Darwinian evolution and

See, e.g., Kathleen Parker, Evolution, Creation Dicey Debate Topics, BALT. SUN, May 14, 2007, at 9A (discussing how the "[d]o you believe in evolution?" debate question put to Republican presidential candidates "remains controversial among some people of faithincluding some respected scientists—for whom evolutionary theory reduces man's world to a godless accident bereft of moral meaning or structure"); see also Patricia Cohen, A Split Emerges as Conservatives Discuss Darwin, N.Y. TIMES, May 5, 2007, at A1 (discussing the presidential debate and observing that "[f]or some conservatives, accepting Darwin undercuts religious faith and produces an amoral materialistic worldview that easily embraces abortion, embryonic stem cell research and other practices they abhor," while explaining how other conservatives have begun relying on Darwin's theories to support many conservative causes). Other recent examples of this culture war abound. A notable one is reflected in the recent movie Expelled: No Intelligence Allowed, which attempts to paint a portrait of a scientist-atheist conspiracy to thwart the teaching of ideas from the Intelligent Design movement in public schools. EXPELLED: NO INTELLIGENCE ALLOWED (Rocky Mountain Pictures 2008). On the other side of the divide, for recent movies attacking religious worldviews, see RELIGULOUS (Lionsgate 2008) and THE GOD WHO WASN'T THERE (Beyond Belief Media 2005).

<sup>3.</sup> See Mary Jo Murphy, Word for Word; My Dear Fellow Species, N.Y. TIMES, May 20, 2007, at D5 (reporting about a new online collection of Darwin's letters, and discussing one in which Darwin describes relating his conclusion that species were not immutable as "like confessing a murder").

<sup>4.</sup> See, e.g., Warren A. Nord, Religion & American Education: Rethinking a National Dilemma 287 (1995) (noting that "a large part of what was revolutionary about the scientific revolution was its rejection of the idea that nature, like history, could be understood only in terms of God's purposes"). That is not to say that materialist philosophies did not exist prior to Darwin; they certainly did. See Peter J. Bowler, Evolution, in The History of Science and Religion in the Western Tradition, supra note 1, at 458, 459 (noting that before Darwin's time "materialist thinkers... had begun to suggest that life could be created on the earth by natural processes (spontaneous generation) and that the species thus produced might change in response to natural forces"). However Darwin's Origin of Species marked a widespread turning point from theism to naturalism as far as scientific explanations about nature were concerned. See John Henry, Atheism, in The History of Science and Religion in the Western Tradition, supra note 1, at 182, 187 ("Darwinism perhaps marks the final removal of God and religion from the scientific enterprise.").

<sup>5.</sup> See Bowler supra note 4, at 458-59 (noting that "Darwin proposed new lines of evidence to show how evolutionism could explain natural relationships, but he also suggested a new and potentially more materialistic mechanism of evolution").

theistic creation were compatible with each other—in short, that God created humankind using some form of evolutionary mechanism.<sup>6</sup>

Such attempts at reconciling these two concepts were cold comfort to those religious groups that took the *Bible* at its literal word, however, and such "creationists" mobilized political and legal forces to stem the spread of evolutionary theory—at least in terms of it being taught in public school science classes. When laws were passed prohibiting the teaching of evolution in science courses, the courts eventually invalidated them as being religiously motivated in violation of the Establishment Clause of the First Amendment. One major response was to enact laws mandating the teaching of "scientific evidence" for Biblical creation (i.e., "creation science") in conjunction with any teaching of evolutionary theory. Courts also invalidated such laws on Establishment Clause grounds, in significant part because they determined, implicitly or explicitly, that creation science was not legitimate science.

The "creationism wars" in no sense ended concerns about the potential materialistic or atheistic implications of Darwinian theory (modernly referred to as "neo-Darwinian theory" based on its supplementation with more recent scientific findings). Indeed, in the 1990s, a group of scholarly religionists driven more by concerns about those implications than literal conflicts with sacred text, including a perceived infiltration of secularist and materialistic attitudes into the American consciousness, initiated a more sophisticated attack on evolutionary theory. Having learned from the "creation wars," this group has attempted to put forth critiques of that theory based on what they claim is

<sup>6.</sup> See infra notes 74-76 and accompanying text (noting that by 1870 most educated people and scientists accepted the concept of evolution but still believed God was behind the process).

<sup>7.</sup> See Ronald L. Numbers, Creationism Since 1859, in The HISTORY OF SCIENCE AND RELIGION IN THE WESTERN TRADITION, supra note 1, at 313, 314–16 (describing creationists' efforts to erase Darwinism from public school textbooks).

<sup>8.</sup> See, e.g., Epperson v. Arkansas, 393 U.S. 97, 98–99, 109 (1968) (holding unconstitutional an Arkansas law which made it unlawful for a teacher in a public school or university to teach or use a textbook that teaches "the theory or doctrine that mankind ascended or descended from a lower order of animals"). It took some time for antievolution laws to be invalidated. They were initially passed in the 1920s and served as the basis for the famous Scopes monkey trial. *Infra note* 86 and accompanying text.

<sup>9.</sup> See, e.g., Edwards v. Aguillard, 482 U.S. 578, 591–92 (1987) (invalidating creation science law as being religiously motivated and implying that creation science was not legitimate science in determining that it embodied a religious belief in a supernatural creator); McLean v. Ark. Bd. of Educ., 529 F. Supp. 1255, 1272 (E.D. Ark. 1982) (invalidating creation science law as having the purpose and effect of advancing religion, and explicitly determining that creation science was not legitimate science).

<sup>10.</sup> See infra note 76 and accompanying text (discussing the "neo-Darwinian synthesis" of the 1930s and 1940s).

legitimate scientific evidence and analysis—essentially purporting to present scientific proof that neo-Darwinian theory cannot explain the emergence of more complex life forms on Earth. At its core, the so-called "Intelligent Design" (ID) movement claims that the central tenet of neo-Darwinian theory—the gradual evolution of life forms based on random mutations that nature "selects" for continued existence according to their survival value (otherwise known as the theory of natural selection)—is fatally flawed either because such a process cannot logically produce the complex life forms that it claims to, or because the mathematical probability that such life forms can arise through random events is virtually nil. Hence, ID proponents conclude, complex life forms must be the product of conscious and intelligent design. The unstated implication of ID theory—"unstated" presumably because of concerns about scientific legitimacy in general, and the constitutionality of teaching such a concept in particular—is that such life forms must have been created by an intelligent, supernatural being rather than random natural processes. 12

The ID movement has enjoyed some traction, with its most notable accomplishment being its inclusion in a policy adopted by the school board of Dover, Pennsylvania requiring its high school science teachers to notify their students about ID theory as an alternative to evolutionary theory. Is ay "most notable" because Dover's policy drew the first court decision to assess the constitutionality of promoting ID in the science classroom. A federal district court in Dover held that the board's policy violated the Establishment Clause, in large part because ID theory did not constitute legitimate science. According to the court, "ID is not science and cannot be adjudged a valid, accepted scientific theory as it has failed to publish in peer-reviewed journals, engage in research and testing, and gain acceptance in the scientific community. ID... is grounded in theology, not science... [and] has utterly no place in a science curriculum."

Not only, then, has the ID movement lost its first major battle to be considered science, but it also constitutes one of several developments that has been responsible for initiating a third major phase of the theism-materialism

<sup>11.</sup> See infra notes 117-30 and accompanying text.

<sup>12.</sup> See Frances S. Collins, The Language of God: A Scientist Presents Evidence FOR Belief 186 (2006) (asserting that the "ID movement is careful not to specify who this designer might have been, but the Christian perspective of most of the leaders of this movement implicitly suggests that this missing force would come from God himself").

<sup>13.</sup> See Kitzmiller v. Dover Area Sch. Dist., 400 F. Supp. 2d 707, 708–09 (M.D. Pa. 2005) (describing a resolution and a press release announcing new policy).

<sup>14.</sup> Id. at 765.

<sup>15.</sup> Id. at 745.

contest in America. Up until very recently, the scientific community has generally contented itself with fending off the attempts of creationists and ID proponents to, as it saw it, undermine the teaching of evolutionary science in public education. In the last couple of years, however, many possessing science-centered worldviews have gone on the offensive against religion in a surprisingly aggressive way. Bolstered by advances in evolutionary biology. human genetics, and studies of human cognition, and angered by everything from the "alleged influence of the Christian right on Bush Administration science policy to the fanatic faith of the 9/11 terrorists to intelligent design's ongoing claims." <sup>16</sup> scientists that believe our existence is wholly explainable in materialistic terms have flooded the market with books "describing a caged death match between science and God—with science winning, or at least chipping away at faith's underlying verities."<sup>17</sup> In addition to writing one of those books which he called *The God Delusion*. 18 Richard Dawkins, a former biology professor at Oxford University and one of the leading spokespersons of the dominant atheist segment of the scientific community, spoke at a conference on the religion-science divide and described religious education as "brainwashing" and "child abuse." 19 Such books and conferences have prompted leading scientists who do believe in a creator to "come out of the closet" and present their case. Most notably, Francis Collins, the former head of the U.S. Government's touted Human Genome Project, recently published The Language of God: A Scientist Presents Evidence for Belief 20

<sup>16.</sup> David Van Biema, God vs. Science, TIME, Nov. 13, 2006, at 48.

<sup>17.</sup> Id.; see also id. at 52 (discussing the new book of atheist and science commentator Richard Dawkins, and noting that he was "riding the crest of an atheist literary wave"). However, the current materialism versus theism debate is not limited to scientists. In addition to Dawkins and neuroscience doctoral candidate Sam Harris, the so-called "four horsemen" of the new atheism also includes Daniel Dennett, a professor of philosophy, and Christopher Hitchens, a journalist. All four of these individuals have each published recent books on atheism's claimed intellectual superiority to theism. See generally RICHARD DAWKINS, THE GOD DELUSION (2006); DANIEL DENNETT, BREAKING THE SPELL: RELIGION AS A NATURAL PHENOMENON (2006); SAM HARRIS, THE END OF FAITH: RELIGION, TERROR, AND THE FUTURE OF REASON (2004); CHRISTOPHER HITCHENS, GOD IS NOT GREAT: HOW RELIGION POISONS EVERYTHING (2007). See also generally JOHN ALLEN PAULOS, IRRELIGION: A MATHEMATICIAN EXPLAINS WHY THE ARGUMENTS FOR GOD JUST DON'T ADD UP 148–49 (2008).

<sup>18.</sup> DAWKINS, *supra* note 17; *see infra* notes 292–97 and accompanying text (discussing further Dawkins's claims).

<sup>19.</sup> See George Johnson, A Free-for-All on Science and Religion, N.Y. TIMES, Nov. 21, 2006, at F1 (reporting on a conference of prominent scientists where religion was heavily criticized).

<sup>20.</sup> Francis S. Collins, The Language of God: A Scientist Presents Evidence for Belief 3 (2006); see infra notes 298–307 and accompanying text for a further discussion of Collins's claims; see also Darrel R. Falk, Coming to Peace with Science: Bridging

It is not surprising that the question of the basic character of our origins and existence has engendered protracted legal contests and now a virulent cultural debate. Plainly, a person's beliefs regarding this fundamental question can go a long way towards shaping her basic decisions, attitudes, and values in life, affecting not only her view of her place in the universe and her relationship to others, but also the very meaning of her existence.<sup>21</sup> In other words, it normally *matters* to a person's basic outlook on life whether she believes that human existence is the product of impersonal natural forces or the handiwork of a caring, divine being. In short, such beliefs can have a profound effect on the shaping of an individual's worldview.<sup>22</sup>

Thus, it is troubling that American public education does little to nothing to prepare students—and particularly older high school students that are starting to seriously think about these issues, including those who may never go on to a college education where courses might first begin to cover some of

THE WORLDS BETWEEN FAITH AND BIOLOGY (2008); JOAN ROUGHGARDEN, EVOLUTION AND CHRISTIAN FAITH: REFLECTIONS OF AN EVOLUTIONARY BIOLOGIST (2006); accord Kenneth R. MILLER, FINDING DARWIN'S GOD: A SCIENTIST'S SEARCH FOR COMMON GROUND BETWEEN GOD AND EVOLUTION (1999).

21. As Harvard psychiatry professor Armand Nicholi eloquently puts it:

Whether we realize it or not, all of us possess a worldview. A few years after birth, we all gradually formulate our philosophy of life. Most of us make one of two basic assumptions: we view the universe as a result of random events and life on this planet a matter of chance; or we assume an Intelligence beyond the universe who gives the universe order, and life meaning. Our worldview informs our personal, social, and political lives. It influences how we perceive ourselves, how we relate to others, how we adjust to adversity, and what we understand to be our purpose. Our worldview helps determine our values, our ethics, and our capacity for happiness. It helps us understand where we come from, our heritage; who we are, our identity; why we exist on this planet, our purpose; what drives us, our motivation; and where we are going, our destiny . . . . Our worldview tells more about us perhaps than any other aspect of our personal history.

ARMAND M. NICHOLI, JR., THE QUESTION OF GOD: C.S. LEWIS AND SIGMUND FREUD DEBATE GOD, LOVE, SEX, AND THE MEANING OF LIFE 7 (2002); see also COLLINS, supra note 20, at 6 (discussing scientific versus spiritual worldviews and observing that "[w]hether we call it by name or not, all of us have arrived at a certain worldview. It helps us make sense of the world around us, provides us with an ethical framework, and guides our decisions about the future").

22. See NICHOLI, JR., supra note 21, at 7 (discussing the two basic assumptions that help to formulate our philosophy of life and noting the implications our worldview has on our lives); see also id. at 9 (observing that "if the spiritual [versus materialistic] worldview is true, then all other truth fades in significance. Nothing has more profound and more far-reaching implications for our lives"); Frederick Gregory, Materialism, in The HISTORY OF SCIENCE AND RELIGION IN THE WESTERN TRADITION, supra note 1, at 176, 176 ("From the time of the ancient Greeks, . . . the human need for a foundational belief upon which to base a worldview has swayed back and forth between the poles of matter and spirit. Depending upon which pole one chooses, . . . the worlds that result turn out to be very different places.").

them<sup>23</sup>—to understand and appreciate basic scientific and religious perspectives on this matter, and ultimately to assist them in forming their own worldviews.<sup>24</sup> Religion is essentially ignored by public schools (including religious perspectives on the nature of reality),<sup>25</sup> while science frequently presents a very sterile account of evolutionary theory without placing it in proper context—i.e., without educating students on the inherent limits of the scientific endeavor (its methodological commitment to explaining how the natural world works *solely* in terms of its observed laws and properties), or explaining the fact that science, by its own ground rules, is not designed to answer questions about why such natural processes or laws might exist in the first place and how they may have originated.<sup>26</sup> And even if evolutionary theory was presented to students with the proper analytical caveats, the absence of any attempts by schools to draw out the broader implications of that theory for comprehensive perspectives on meanings of life, and to balance those against religious views on the subject, seems to favor scientific or materialistic accounts of existence by default or implication.<sup>27</sup>

While one could argue that religious perspectives on life receive their due at home or in worship communities, there are at least two major problems with this. First, as Kent Greenawalt has written, teaching science but ignoring religion as part of a public education tends to disparage the latter mode of viewing the world because the imprimatur of being considered sufficiently important to be included in that education is denied to it.<sup>28</sup> Second, religion in

<sup>23.</sup> Cf., e.g., Nord, supra note 4, at 213 (noting that "religion is central to liberal education" and that "a majority of students will not go on to receive a liberal education in universities, either because they will pursue no higher education at all or because they will receive a narrowly technical or professional education").

<sup>24.</sup> See, e.g., Jay D. Wexler, Darwin, Design and Disestablishment: Teaching the Evolution Controversy in Public Schools, 56 VAND. L. REV. 751, 760 (2003) ("If schools are going to train citizens to be capable of participating effectively and knowledgeably in American democracy, they must do a better job of teaching students about religious ideas, and religious views on the origins of universe and mankind are among the most important of these ideas . . . . ").

<sup>25.</sup> See, e.g., KENT GREENAWALT, DOES GOD BELONG IN PUBLIC SCHOOLS? 81 (2005) (stating that "[m]ost public schools now largely ignore religion"); NORD, supra note 4, at 1 ("It is a striking fact that in American public schools . . . students can—and most do—earn high school diplomas . . . without ever confronting a live religious idea. We take it for granted that students can know everything they need to know about whatever they study without knowing anything about religion.").

<sup>26.</sup> Infra notes 192-201 and accompanying text.

<sup>27.</sup> Infra notes 206-07 and accompanying text.

<sup>28.</sup> See Greenawalt, supra note 25, at 83-84 (discussing the common complaint that "by treating all subjects from a secular point of view and by presenting secular modes of knowledge as sufficient for life, instruction within schools implies that religious understanding

worship communities tends to be primarily sectarian, focusing largely on religious doctrine and practice.<sup>29</sup> Such religious training would likely lack the broader philosophical and theoretical approaches and viewpoints needed to fully come to grips with the materialism-theism debate.<sup>30</sup>

So what is the solution to preparing our younger generations to consider and make up their owns minds about such important questions of life, particularly if religious approaches to questions of our origins and existence cannot be considered in the science classroom because of the way science defines its own endeavor? I will argue that the solution is what presidential candidates, other politicians, and even some scientists are starting to intuit—that instead of seeking to include asserted evidence and arguments in favor of "nature-plus" causes or explanations for life in the science classroom, they, together with analogous cases for a more materialistic account, ought to be taught in a basic philosophy course designed for this subject and geared to upper class high school students (call it "Perspectives on the Nature of Life" or something along these lines). In contrast to science, philosophy investigates

is not at the center of human understanding, but rather at its periphery," and observing this critique was "substantially accurate").

<sup>29.</sup> Cf., e.g., Ferenc M. Szasz, Modern American Mainline Protestantism, in The HISTORY OF SCIENCE AND RELIGION IN THE WESTERN TRADITION, supra note 1, at 291, 294 ("Similarly, the changes in the scientific community—such as the discovery of DNA . . .; the acceptance of plate tectonics or continental drift . . .; and the discovery of quarks and other subnuclear particles . . . —evoked little interest in the churches.").

<sup>30.</sup> By labeling this as a "materialism-theism" debate, I in no way mean to suggest that these are the only two legitimate paradigms of reality. Many religions do not recognize the concept of a personal God, one of the hallmarks of a theistic religion such as Judaism, Christianity, or Islam. However, since the American legal and cultural contests between science and religion have tended to involve Christian groups, this Article will oversimplify matters and focus primarily on the materialism-theism debate. Cf. Gary B. Ferngren, Preface, in The History of Science and Religion in the Western Tradition, supra note 1, at xiii, xiv (explaining that "underlying the diversity of the several streams that have fed Western civilization, there exists a basic substratum, formed by the West's dual heritage of the classical world of Greece and Rome and the monotheistic traditions of Judaism, Christianity, and Islam"). However, I will also discuss how origins perspectives from other religious traditions could be taught in the sort of high school course I will advocate herein. Infra notes 367–68 and accompanying text.

<sup>31.</sup> See, e.g., Sam Brownback, Op-Ed, What I Think About Evolution, N.Y. TIMES, May 31, 2007, at A19 (discussing debate question on evolution and then-presidential candidate stating that "[m]any questions raised by evolutionary theory—like whether man has a unique place in the world or is merely the chance product of random mutations—go beyond empirical science and are better addressed in the realm of philosophy or theology"); Michael Luo, Romney Elaborates on Evolution, The Caucus Blog, http://thecaucus.blogs.nytimes.com/2007/05/11/romney-elaborates-on-evolution/ (May 11, 2007, 10:19 EST) (last visited Nov. 6, 2008) (then-presidential candidate observing that "[i]n my opinion, the science class is where to teach evolution . . . . If we're going to talk about more philosophical matters, like why it was created, and was there an

"the nature, causes, or principles of reality, knowledge, or values, based on logical reasoning rather than empirical methods." In other words, consideration of the nature of reality in a philosophy course would not be confined to inferences drawn from empirical evidence in the physical world, but would also consider arguments from other sources of human understanding including religious experience, intuition, and insights. Such a course would ideally give students a variety of raw materials for assisting them to answer one basic question for themselves: Considering different sources of human knowledge and understanding, what account of existence seems to make the most sense?

If politicians can see this as a solution to the "religion as science" battles in public education, one might plausibly ask why school districts have not already implemented such a proposal—or something akin to it—as an alternative to fighting costly and protracted legal contests over what evidence and argumentation does or does not count as legitimate science. One reason may be the "epistemic superiority" many perceive science as possessing over other ways of knowing and understanding the world because it is methodologically committed to a rigorous analysis of evidence accessible to our physical senses. In other words, the argument would go, students and others accept science as the most accurate account of life because it is based on types of information that are the most obvious and tangible to us, and thus evidence and argumentation for "nature-plus" causation will be taken seriously only when garbed in such clothing. There may be something to this, but the long history and tenaciousness of the "religion as science" disputes seem to indicate a more

intelligent designer behind it, that's for the religion class or philosophy class or social studies class") (on file with the Washington and Lee Law Review); Governor Says Intelligent Design Doesn't Belong in Science Classes, ASSOC. PRESS, Aug. 29, 2005 (describing governor of Utah's idea that intelligent design should not be taught in science classes but rather should be taught "[i]f it comes up in sociology or philosophy as differing views on creation"); see also Alan I. Leshner, Editorial, Redefining Science, SCIENCE, July 8, 2005, at 221 ("[I]t is appropriate to teach about belief-based concepts like ID in humanities courses, in classes comparing religious points of view, or in philosophy courses that contrast religious and scientific approaches to the world. However, what is taught in science class should be limited to science. Redefining science to get a particular belief into the classroom simply isn't educationally sound.").

<sup>32.</sup> THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE 1319 (4th ed. 2000). For a more extended discussion of the nature of philosophy, see infra notes 276–83 and accompanying text.

<sup>33.</sup> See, e.g., Griffin, supra note 1, at 214, 215 (discussing views of philosopher Alfred North Whitehead that "[p]hilosophy must, in particular, draw upon nonsensory intuitions as well as sensory experience, thereby allowing religious experience to make its own contribution to metaphysics").

<sup>34.</sup> See generally infra Part III.A.

systemic or "structural" cause for the lack of any sort of formal philosophical consideration of materialistic versus theistic accounts of life in public education. If leading candidates for such a cause were to be identified, one would likely be the U.S. Supreme Court's tangled Establishment Clause jurisprudence, which has marked science as a legitimate subject of public education but has thrown up caution signals and red flags around any teaching involving religion.<sup>35</sup>

The Court has repeatedly held that public schools may not teach religion as truth, even though in dicta it has stated that they may constitutionally teach and educate students about religion. At the same time, however, the Court has decreed in various decisions that the government may not take any actions that have the purpose, appearance, or primary effect of advancing or inhibiting sectarian religious beliefs or religious belief in general. In other words, government neutrality towards religion and nonreligion seems to be the touchstone of these principles. But if schools teach students about religion, and particularly about religious perspectives on subjects, aren't they inevitably going to advance or inhibit religious beliefs based on a student's agreement or disagreement with those perspectives? And is the government in such cases acting neutrally towards religion, in either purpose, appearance, or effect?

The answers to these questions are certainly not self evident, and it is easy to see why public school boards across the country essentially take a "hands off" approach to teaching religion and have implemented largely secular curriculums.<sup>38</sup> These questions would likely be even more troubling to a school board official who otherwise might seriously consider implementing a basic philosophy of origins course along the lines suggested above as a potential solution to the "religion as science" problem. Unlike a history or comparative

<sup>35.</sup> See, e.g., CHARLES C. HAYNES & OLIVER THOMAS, FINDING COMMON GROUND: A GUIDE TO RELIGIOUS LIBERTY IN PUBLIC SCHOOLS 5 (2001) (asserting that the influence of the mistaken view of the Establishment Clause that religion must be excluded from the public schools "is apparent in the virtual silence about religion in most of the curriculum"). As Kent Greenawalt helpfully pointed out to me, the absence of any such course may simply result from the fact that public high schools do not typically offer any philosophy classes in their curricula. This may well be, but it seems highly plausible that even if such schools might be inclined to break from typical practice and offer one of the nature proposed in this Article, Establishment Clause concerns might very well stifle such an initiative in its inception. See infra notes 38–40 and accompanying text.

<sup>36.</sup> See, e.g., Sch. Dist. of Abington Twp., Pa. v. Schempp, 374 U.S. 203, 225 (1963) ("Nothing we have said here indicates that such study of the Bible or of religion, when presented objectively as part of a secular program of education, may not be effected consistently with the First Amendment."); see also infra notes 329–30 and accompanying text.

<sup>37.</sup> Infra notes 322-33 and accompanying text.

<sup>38.</sup> Supra notes 25, 35.

religion course that aims mainly at communicating factual materials regarding a religion's role in history or its tenets and practices, the nature of a philosophy course is essentially to dissect and evaluate the rationality of differing claims to truth from the perspective of reason, human experience, and empirical evidence.<sup>39</sup> And while rational, critical evaluation does not necessarily entail the making of ultimate judgments about the relative soundness of such claims, it certainly moves closer to the line of "truth-teaching" than does the mere descriptive or explanatory teaching of religion. In sum, it is easy to see how difficulties in understanding and applying the Court's Establishment Clause doctrine might chill education officials from adding basic comparative and historical religion courses to public school curricula, much less a course designed to explore philosophically the claims of science and religion about fundamental questions of human existence.<sup>40</sup>

This Article, then, will analyze whether a basic philosophy of origins course designed to resolve the "religion as science" controversy in public schools can indeed be taught consistently with existing Establishment Clause doctrine. It will not only fill a conspicuous gap in the scholarly literature as to the feasibility and legality of such a course, but also with regard to how critical evaluations of claims to truth from religious perspectives fit into the Court's overly simplistic "teaching about" versus "teaching of" religion paradigm.<sup>41</sup>

<sup>39.</sup> See generally infra Part III.C.

However, in 2005 a California public school district adopted plans to teach a high school course on origins, purportedly from a philosophical approach, but abandoned them after parents and the ACLU threatened to sue on the grounds that the particular course at issue had been specifically designed to promote religion—i.e., intelligent design. See Laurie Goodstein, California Parents File Suit Over Origins of Life Course, N.Y. TIMES, Jan. 11, 2006, at A18 (discussing how the proposed course entitled "Philosophy of Design" was, in reality, a thinlyveiled guise to teach intelligent design). This incident was unfortunate, since, as I will argue, the school district unwittingly had the right solution to teaching different origins perspectives using a philosophical rather than scientific approach—but attempted to implement it in a decidedly non-philosophical way (i.e., as a ruse to advocate religion rather than to promote, in good faith, an understanding of various origins perspectives). It is my hope that this event will not deter or taint honest efforts by other school districts to offer a genuine philosophy of origins course to educate students on issues so fundamental to their lives, and as a potential solution to the "religion as science" conflicts discussed in this Article. In this spirit, I will propose certain measures that school districts planning to offer such a course could adopt to prevent the sort of misuse of it as occurred in this case. See infra Part IV.C.

<sup>41.</sup> This is not to say that other scholars have not made proposals for reforming the public school curriculum to address some of these issues, but they have focused mainly on teaching comparative sectarian versions of origins in a social or religious studies course for the purpose of addressing the creationism and ID versus evolution controversies. See, e.g., NORD, supra note 4, at 289-92; WEXLER, supra note 24, at 776-99; see also GREENAWALT, supra note 25, at 90-91 (arguing that students should be apprised of gaps in evolutionary theory, which might include a discussion of ID as one conceivable alternative, but concluding that "[s]erious

Part II will present a more detailed overview of the historic materialism-theism debate within Western civilization—demonstrating that it is one that has been ongoing since ancient times—as well as the "religion as science" battles in American schools and the more recent escalation of the culture war related to this issue. 42 Part III will examine the reasons why modern creationists and ID proponents continue pushing for their views and theories to be considered in public school science classes, and their prospects for succeeding on that strategy—especially in the wake of Kitzmiller. 43 It will conclude that these prospects are dim even though such groups will likely never give up this fight unless an acceptable alternative becomes available. It will then discuss why a basic philosophy of origins course would be the best choice for such an alternative and begin to trace the outlines of what the subject matter of such a course might look like. More specifically, it will contend that addressing any "ism's" that might be implied by an exclusively scientific account of our origins to a philosophy of origins course would be the best solution because such belief systems are more appropriately examined as philosophy than science.

Lastly, Part IV will examine whether such a course can be offered that is consistent with modern Establishment Clause doctrine. It will conclude that, despite the vagaries of that doctrine it can, as long as appropriate measures are taken to ensure that textbooks and teachers of such a course avoid making any judgments about the ultimate truth of competing counts, sticking instead to assisting students to develop their own worldviews by presenting a variety of perspectives and helping them to evaluate critically their basis in reason, evidence, and experience. It will also argue that to the extent Establishment Clause doctrine is read otherwise, it would present substantial tensions with the Free Speech Clause of the First Amendment that should be avoided. Finally, Part IV will outline various steps in the planning and implementation of an origins course that school districts could take to provide assurance that its

development of competing [origins] perspectives should be reserved for courses in history, culture or comparative religion, or courses self-consciously adopting an interdisciplinary approach, such as 'Perspectives on the Environment'"). This Article takes a different approach. Not only does it argue that students ought to be taught broader origins perspectives than sectarian religious versions to prepare them for the ongoing materialism-theism debate (although such social or religious studies courses could and should be offered in addition to the course proposed herein), but that different religious and scientific perspectives ought to be taught and compared using philosophical analysis both to deepen students' understanding of these issues and to ideally take some pressure off of the creation-evolution controversies to the extent they are being driven by perceived conflicts involving specific sectarian versions of origins.

<sup>42.</sup> See generally infra Part II.

<sup>43.</sup> See generally infra Part III.

<sup>44.</sup> See generally infra Part IV.

subject matter and teaching remained well within constitutional bounds. It is this author's hope that such a course would not only go far towards preparing our young generation to develop individually and participate in public discourse with respect to these fundamental questions, but also to defuse the "religion as science" controversies that are sure to continue roiling our Nation in the absence of such a solution.

# II. The Western Materialism-Theism Divide and Its Manifestations in American Public Education and Popular Culture

## A. Greco-European Antecedents

Since the dawning of Western civilization, its peoples have generally recognized a god or gods associated with the creation of the universe and humankind. A belief in such deities allowed people to make better sense of their world and existence—where they came from and what their place was in the order of things. The ancient Greeks had a polytheist tradition and recognized multiple gods that were part of the natural world, shared many attributes of humans, and interacted with them in various ways. Ancient Hebrew tribes from more eastern lands, by contrast, had developed a monotheistic tradition that worshipped one God who transcended the natural world—that is, existed in a *super*natural state on a separate plane of reality frequently referred to as a spiritual plane of existence. Like the Greek gods, the Hebrew God remained present in the natural world; unlike those gods, however, His interactions with humans were more subtle, consisting primarily

<sup>45.</sup> See, e.g., Frederick Suppe, Epistemology, in The HISTORY OF SCIENCE AND RELIGION IN THE WESTERN TRADITION, supra note 1, at 24, 24 ("Both religion and science attempt to bring order, understanding, and even control to the cosmos that human beings inhabit.").

<sup>46.</sup> See Jan N. Bremmer, Greek Religion [Further Considerations], in 6 ENCYCLOPEDIA OF RELIGION 3677, 3677–81 (Lindsay Jones ed., 2d ed. 2005) (discussing various ancient Greek Gods, their human attributes, and their interactions with humans and each other); JAN N. Bremmer, Greek Religion 5 (Oxford Univ. Press 1994) ("Whereas the Christian world-view increasingly separates God from this world, the gods of the Greeks were not transcendent but directly involved in natural and social processes.").

<sup>47.</sup> See S. David Sperling, God: God in the Hebrew Scriptures, in 5 ENCYCLOPEDIA OF RELIGION, supra note 46, at 3537, 3539 (describing the development of Hebraic monotheism).

<sup>48.</sup> See Theodore M. Ludwig, Monotheism, in 9 ENCYCLOPEDIA OF RELIGION, supra note 46, at 6155, 6158–59 (explaining that monotheism posits "a definite separation between the one divine reality and the world that God brought into existence. In this sense, there is a dualistic emphasis in monotheism, for there are two distinct realms of reality, the divine and the created world").

of intermittent revelations and interventions combined with an abiding spiritual presence in world and the depths of human consciousness.<sup>49</sup>

The Romans had a polytheistic tradition that over time assimilated much of the Greek mythologies, but after the Emperor Constantine legalized Christianity in the Roman Empire in 313,50 the Hebraic monotheistic tradition started on a path toward dominance in Western civilization. After the fall of that empire, this tradition was largely carried forward through the Middle Ages by the Roman Catholic Church, and even after the sixteenth-century Reformation splintered Christianity the tradition of a monotheistic "transcendent but immanent" God remained dominant in the West and continues so today among its religious believers (including not only Christians, of course, but the West's Jewish and Muslim believers as well).51

Belief in such a Deity or deities, however, has almost always been conditioned by humankind's sentient and rational faculties—its ability to empirically observe the world and engage in logical reasoning about it. Throughout history, humankind has relied on such faculties to either support or criticize religious beliefs depending on one's worldview regarding such matters. Thus, for example, classical Greek philosophers such as Democritus and Epicurus developed a system of thought called atomism which attempted to explain "all physical phenomena in terms of the behavior and interaction of vanishingly small indivisible particles." Although not explicitly a denial of ancient Greek religion—Epicurus himself, for example, took the position that the gods existed but did not concern themselves with the natural world the atheistic overtones of atomism contributed to the effort of

<sup>49.</sup> See Sperling, supra note 47, at 3542 ("Though God was generally not visible, he might manifest himself publicly in the kavod . . . . [T]he kavod of Yahveh is of intense luminosity and is often shielded by a cloud. The kavod is sometimes spoken of as filling the entire earth.") (citations omitted); Ludwig, supra note 48, at 6159 ("[M]ost forms of monotheism hold God not only as transcendent but also as immanent in the world: God's presence, power, and operation are immediately present in human experience. . . . Revelation from God is important as guidance . . . . And God works in the history of the world, directing events toward an eschaton in which there will be evaluation and judgment.").

<sup>50.</sup> See Nathan D. Mitchell, Religious Communities: Christian Religious Orders, in 11 ENCYCLOPEDIA OF RELIGION, supra note 46, at 7721, 7723 (discussing "the emperor Constantine's Edict of Milan (313), which recognized Christianity as a licit religion in the empire").

<sup>51.</sup> See generally, e.g., Hans Kung & John Bowden, The Catholic Church: A Short History (2001).

Henry, supra note 4, at 122.

<sup>53.</sup> See Gregory, supra note 22, at 177 ("For Epicurus and Lucretius, who believed in the existence of the gods, the lack of involvement was due to the gods' complete lack of interest in natural or human affairs.").

Socrates and his student Plato to argue for the additional existence of non-material planes of reality such as the soul or the ideal world of the "Forms." <sup>54</sup>

While rationalist thought about the nature of reality, and particularly atomist philosophy, laid fairly quiescent during the dominance of Christian orthodoxy throughout the Middle Ages, it reemerged in the middle of the second millennium and developed into a "mechanical philosophy" propounded by several seventeenth-century philosophers. That system of philosophy again sought to explain all natural phenomena in terms of small particles of matter and their motions, and was the basis for Isaac Newton's revolutionary discoveries regarding the laws of physical motion. While Newton and other leading proponents of mechanical philosophy were committed Christians who viewed and promoted such a law-bound system as the way in which God designed and planned the operation of the natural world, they also feared its potential materialistic and atheistic implications. Such fears were realized in the eighteenth century Enlightenment, when anticlerical sentiments ran high and several prominent philosophers relied on mechanical philosophy to promote an atheistic and materialistic view of reality. Nonetheless, in the

<sup>54.</sup> See Edward B. Davis & Robin Collins, Scientific Naturalism, in The History of Science and Religion in the Western Tradition, supra note 1, at 201 ("Although Plato... shared the atomists' opposition to Greek polytheism, he rejected their purely natural nonteleological mode of explanation."); Stanley L. Jaki, God, Nature, and Science, in The History of Science and Religion in the Western Tradition, supra note 1, at 45 ("It was in reaction to th[e] dehumanizing trend [of materialism and atomism] that Socrates... proposed the animation of all matter so that a defense of the existence of an immortal human soul (anima) could be argued."); Richard Kraut, Plato, in The Cambridge Dictionary of Philosophy 709, 710 (Robert Audi ed., 2d ed. 1999) (describing the existence of abstract objects known as forms that are "eternal, changeless, and incorporeal; since they are imperceptible, we can come to have knowledge of them only through thought").

<sup>55.</sup> See Margaret J. Osler, Mechanical Philosophy, in THE HISTORY OF SCIENCE AND RELIGION IN THE WESTERN TRADITION, supra note 1, at 149, 149–50 ("Because of its reputation as atheistic and materialistic, Epicureanism [i.e., atomism] fell into disrepute during the Middle Ages."); id. at 150–51 (discussing adoption of mechanical philosophies by philosophers Pierre Gassendi and Rene Descartes based on ideas derived from atomism).

<sup>56.</sup> See id. at 149 ("Mechanical philosophy was a philosophy of nature, popular in the seventeenth century, that sought to explain all natural phenomena in terms of matter and motion without recourse to any kind of action-at-a-distance."); id. at 151–53 (discussing Newton's acceptance of mechanical philosophy and his subsequent discoveries that were driven by it).

<sup>57.</sup> See, e.g., id. at 151 ("Another mechanical philosopher, Thomas Hobbes, . . . was the specter haunting more orthodox mechanical philosophers. Whatever the state of his religious beliefs, Hobbes's philosophy seemed—to the seventeenth century reader—to be materialistic, deterministic, and possibly even atheistic.").

<sup>58.</sup> See id. at 153. Osler states:

In the decades after Newton's death, the worst fears of the Christian mechanical philosophers of the seventeenth century came true.... Some of the French philosophes... espoused atheistic materialism and adopted vigorously anticlerical

same period many Christian philosophers continued to defend mechanical philosophy as evidencing God's purposeful design of the natural world.<sup>59</sup>

Regardless of whether one viewed mechanical philosophy as supporting or undermining religious claims, when the profession of science began to emerge in the nineteenth century, that philosophy laid the foundation for the adoption of a naturalistic or materialistic commitment in the performance of science; that is, a commitment to explaining phenomena solely in terms of natural mechanisms and causes (otherwise known as "methodological naturalism"). Not only was that commitment a by-product of the new profession's desire to distinguish itself from the established clergy that had produced many of the earlier natural philosophers, but it was also part of a wider trend of cultural secularization in which European society was continuing to free itself from the authoritarian influence of institutionalized Christianity. But something else happened in the nineteenth century that turned a trend towards scientific methodological naturalism into a trend towards scientific ontological naturalism or the adoption of a wholly materialistic worldview—the publication by Darwin in 1859 of his Origin of Species. Else

Evolutionary theory was not new with Darwin. The idea of random changes producing anatomical changes in animals had its seeds in the atomist philosophy of ancient Greece. 63 Moreover, in the eighteenth century several

and antiecclesiastical views . . . . David Hume . . . undermined the possibility of natural religion and a providential understanding of the world by purporting to demonstrate the invalidity of the standard arguments for the existence of God, particularly the argument from design, which had played such a crucial role for the seventeenth century mechanical philosophers.

- Id.; Gregory, supra note 22, at 178 (focusing on the works of the eighteenth century philosophers La Mettrie and D'Holbach in support of the idea that the period relied on mechanical philosophy to promote a materialistic view of reality).
- 59. See, e.g., id. at 178-79 (describing the works of the experimentalist-clergyman-materialist Priestley as a counterpart to the Christian materialism of Gassendi).
- 60. See Davis & Collins, supra note 54, at 201–03 (describing the evolution of naturalist thought in the West and its culmination in scientific methodological naturalism).
- 61. See id. at 202–03 (discussing the movement of naturalism away from theology and into a secular way of thought, separate from a theological underlying explanation); Henry, supra note 4, at 182–83, 186–87 (discussing evolution of anticlericalism and secularization in European science and society).
- 62. See Davis & Collins, supra note 54, at 203 (noting that Darwin's theory "played a pivotal role in scientific naturalism's becoming the dominant worldview of the academy by the middle of the twentieth century" and that "in every discipline today, . . . an ontological naturalism is presupposed by most of the practitioners of these disciplines").
- 63. See id. at 201 (explaining that the Greek atomist Empedocles "assigned the origin of all living things to a crude forerunner of evolution by survival of the fittest..." where "parts of animals would form by chance and then come together; only those combinations of parts that fit the right pattern were viable").

naturalists, including Darwin's grandfather, had begun to put forward ideas and theories suggesting that life originated and evolved over time from simple to complex organisms through wholly natural processes—the most prominent being the theory, developed by J. B. Lamarck, that different anatomic features in animals developed in response to environmental needs and were then passed on to their offspring.<sup>64</sup> The pre-Origins of Species response to these ideas varied; radical groups seeking social and political change seized on "materialistic theories such as Lamarckian transformism to attack the image of a static, designed universe that sustained the traditional social structure. Evolutionism became firmly linked to materialism, atheism, and radical politics."65 Religiously-oriented naturalists either dismissed Lamarckian theory and continued to insist that different species were the result of special creations by God, or attempted to explain it as God's plan for the development of life on Earth.66 Included in this latter line of argument was the idea that even if Lamarckian transformism was a natural process, gradual change to anatomical structure to suit environmental need was a purposeful and progressive process that constituted strong evidence of an intelligent Creator's plan for evolving life 67

What made Darwin's *Origin of Species* so controversial was that many believed it made such religious views of human origins more difficult to sustain.<sup>68</sup> Darwin's work not only presented new lines of evidence for the evolution of species—thus further undermining arguments for "special creations"—but it also set forth "a new and potentially more materialistic mechanism of evolution,"<sup>69</sup> the theory of natural selection, which purportedly undercut arguments defending evolution as a purposeful and progressive process implemented by God.<sup>70</sup> According to that theory, random physiological

<sup>64.</sup> See Bowler, supra note 4, at 459 ("By the end of the eighteenth century, Erasmus Darwin . . . and Jean Baptiste Lamarck . . . were beginning to suggest comprehensive theories of transmutation in which life had advanced slowly from primitive origins to its present level of development."); Henry, supra note 4, at 187 (noting that biological evolutionism, "firmly based on the self-organizing powers of matter, with a distinctly atheistic pedigree," was first suggested by Erasmus Darwin and others and developed by Jean Baptiste Lamarck).

<sup>65.</sup> Bowler, supra note 4, at 459.

<sup>66.</sup> See id. (discussing naturalists' reactions to early evolutionist thought).

<sup>67.</sup> See id. (describing a book responding to early evolutionism that "proclaimed a message of progress through nature and human history but attempted to circumvent the charge that transmutationism was atheistic by arguing that progress represented the unfolding of a divine plan programmed into nature from the beginning").

<sup>68.</sup> See id. at 459-61 (discussing the difficulty many theologians and philosophers encountered in coping with Darwin's views of the origin of man).

<sup>69.</sup> Id. at 459.

<sup>70.</sup> Id. at 459-61.

variations in individual members of a species that conferred a reproductive advantage would be passed on to future generations and could eventually result in a new form of animal species—including, presumably, human beings. As many viewed this theory, "[n]ot only were humans reduced to the status of animals, but the natural world that produced us was reduced to a purposeless sequence of accidental changes." Such an unguided, materialist conception of life was so distasteful to many that even leading adherents of evolution in the late-nineteenth and early-twentieth centuries refused to accept Darwinian natural selection as the mechanism of evolutionary change. Indeed, even though by 1870 "the vast majority of scientists and educated people had accepted the basic idea of evolution," most nineteenth-century scientists continued to believe in a theistic version of it whereby God was responsible for that process.

Thus it was that Darwin's theory of evolution by natural selection did not become generally accepted by the scientific community until additional evidence was put forth to support that mechanism some three-quarters of a century after it was first proposed. Building on an increased understanding of Mendelian genetics and the inheritability of genetic traits, population genetics, and the paleontological record, several scientists in the 1930s and 1940s put together what is known today as the neo-Darwinian synthesis—essentially presenting a unified theory of how the underlying mechanisms of natural selection operate.<sup>76</sup> The purported explanatory power of this synthesis was

<sup>71.</sup> See id. at 460 ("Darwin deduced that there must be a 'struggle for existence,' in which any slight advantage would be crucial. Those individuals with variant characters that conferred such an advantage would survive and reproduce and, passing the character on to their offspring. Those with harmful characters would be eliminated.").

<sup>72.</sup> Id.

<sup>73.</sup> Infra note 75.

Bowler, supra note 4, at 460.

<sup>75.</sup> See Jaki, supra note 54, at 49–50 (observing that while some of nineteenth-century science was materialistic, "the majority of scientists during that century still adhered to . . . Christian theism"); see also Numbers, supra note 7, at 313, 314 ("Although the overwhelming majority of scientists after 1880 accepted a long earth history and some form of organic evolution, many in the late nineteenth century expressed serious reservations about the ability of Darwin's particular theory of natural selection to account for the origin of species.").

<sup>76.</sup> See Bowler, supra note 4, at 463 (noting that the emergence of modern genetics, by undermining Lamarckism and supplying a plausible source of the random variation that Darwin had noticed, had become increasingly popular in the 1930s); see also Martinez Hewlett, Molecular Biology and Religion, in The Oxford Handbook of Religion and Science 172, 174–75 (Philip Clayton & Zachary Simpson eds., 2006) ("By 1942, Julian Huxley . . . could tout what he called the 'modern synthesis,' in which the Darwinian model was merged with Mendelian genetics and ideas about populations to produce an overarching paradigm that subsumes the entire field of biology to the present.").

sufficient to convince the bulk of scientists that natural selection was indeed the mechanism by which evolution occurs. Not surprisingly, in light of the history of the materialism-theism debate up to that point, this development spawned new books by many scientists positing a materialistic and atheistic account of the world and human existence. But this was not business as usual. The new evolutionary synthesis set the stage for the first serious attempts to work out and defend such an account "as a comprehensive philosophy, especially with regard to ethics and our understanding of the human mind . . . ." Such attempts, moreover, were not limited to the scientific community but were also made by other members of the higher education academy.

#### B. American Contest Phase One: Creationists Attack Science

While such responses to the neo-Darwinian synthesis certainly troubled many religionists in America, the ongoing debates over evolutionary theory in this country had provoked a backlash from certain religious groups even before the synthesis had emerged. Up until the latenineteenth century, debates about evolution had not provoked much of a public reaction, in part because they were confined largely to scholarly circles and even there many theologians were finding ways to reconcile Christianity with evolutionary theory.<sup>81</sup> But at least

<sup>77.</sup> See id. (finding that due to the emergence of modern genetics, "the biologists themselves gradually began to believe that Darwinism might... be the most promising theory"); Davis & Collins, supra note 54, at 203 (noting that Darwin's theory "played a pivotal role in scientific naturalism's becoming the dominant worldview of the academy by the middle of the twentieth century").

<sup>78.</sup> See Bowler, supra note 4, at 463 ("But other founders of the modern synthesis, especially George Gaylord Simpson..., argued that Darwinism is essentially materialistic: There is no purpose in nature and no goal toward which evolution is striving...."); see also Stephen C. Meyer, The Demarcation of Science and Religion, in THE HISTORY OF SCIENCE AND RELIGION IN THE WESTERN TRADITION, supra note 1, at 17, 18 ("Francisco Ayala, Stephen Jay Gould, William Provine, Douglas Futuyma, Richard Dawkins, Richard Lewontin, and the late G. G. Simpson, for example, all agree that neo-Darwinism... postulates an exclusively naturalistic mechanism of creation, one that allows no role for a directing intelligence.").

<sup>79.</sup> Davis & Collins, supra note 54, at 203.

<sup>80.</sup> See supra note 77.

<sup>81.</sup> See Numbers, supra note 7, at 314 ("The early Darwinian debates remained confined largely to scholarly circles and often focused on issues pertaining to natural theology; thus, those who objected to evolution primarily on biblical grounds saw little reason to participate."); Szasz, supra note 29, at 292–93 (discussing the slow regional progression of controversy that Darwin's evolutionary theory had on Protestantism).

two developments occurred before the synthesis emerged to arouse certain segments of the public against that theory. The first was the occurrence of World War I with its brutality and apparent senselessness, which many blamed in part on the spread of Darwin's theory and its perceived "survival of the fittest" and "might makes right" sub-themes. 82 More importantly, however, public education in America, and especially at the high school level, was undergoing a dramatic expansion at that time.<sup>83</sup> As part of this. evolutionary theory was being spread farther and wider than ever before through biology textbooks.<sup>84</sup> These developments happened to coincide with the rise of a Protestant evangelical movement in America, and in the early 1920s organized Christian fundamentalist groups began agitating for laws prohibiting the teaching of evolution in American public schools.85 Of course, this effort was not just the result of a perception that amoral and atheistic overtones of evolutionary theory contributed to the first world war, but also because of perceived conflicts between that theory and the account of animal and human origins contained in the Bible's Book of Genesis.

Such agitation by Protestant fundamentalist groups bore fruit: In the 1920s it resulted in antievolution laws being debated in twenty state legislatures, with three states (Arkansas, Mississippi, and Tennessee) passing laws banning the public school teaching of evolution, one state (Oklahoma) banning the adoption of public school textbooks containing evolutionary theory, and one state (Florida) passing a resolution condemning the teaching of Darwinism. The Tennessee law gave rise to the famous "Scopes monkey trial" of 1925, in which the State prosecuted a public high school teacher for

<sup>82.</sup> See EDWARD J. LARSON, TRIAL AND ERROR: THE AMERICAN CONTROVERSY OVER CREATION AND EVOLUTION 125 (3d ed. 2003) (commenting that historian George Marsden "described the original anti-evolution crusade as a reaction against First World War German 'barbarism,' which at the time was widely attributed to the acceptance of a Nietzschean evolutionary philosophy"); Szasz, supra note 29, at 294–95 (describing the Protestant rejection of science and Darwinism that followed World War I).

<sup>83.</sup> See Numbers, supra note 7, at 315 ("The early twentieth century witnessed an unprecedented expansion of public education—enrollment in public high schools nearly doubled between 1920 and 1930 . . . . ").

<sup>84.</sup> See LARSON, supra note 82, at 24–25 ("Teaching journals, policies, and manuals dating from the 1890s through the 1910s thus second the evidence from science textbooks that evolutionary instruction penetrated public high-school life-science courses by the turn of the century."); see also id. at 27 ("It was the expansion of public secondary education that carried evolution to an increasing number of America's youth, and this expansion coincided with the anti-evolution crusade.").

<sup>85.</sup> See id. at 40–48 (tracing the beginnings of the movement to abolish evolutionary teaching back to the evangelicalism movement that began before World War I).

<sup>86.</sup> Numbers, supra note 7, at 314.

teaching evolution in his class.<sup>87</sup> Scopes was convicted at a trial that became a "cause célèbre" for religion versus science demagogues, but in an anticlimactic ending the Tennessee Supreme Court reversed the conviction on a sentencing technicality even though it found nothing wrong with the verdict itself.<sup>88</sup>

When the fundamentalist push for antievolution laws in additional states seemed to lose its steam around the end of the 1920s as the Great Depression began, such groups shifted tactics to achieve their goals. Instead of continuing to lobby for more antievolution laws, they pressured local school boards and school textbook publishers to simply drop the teaching of evolutionary theory from public school curricula. As a result of these efforts, evolutionary theory was mostly eliminated from biology and other public high school textbooks across the country, and the fundamentalist groups largely succeeded in accomplishing indirectly what they could not accomplish more directly and broadly through additional legal prohibitions. Thus, from the 1930s to the start of the 1960s, evolution was largely kept out of public middle and high schools across the country by pressuring the public education system to avoid the topic.

With the Soviet's launch of its Sputnik satellite in 1957 and the advent of the American-Soviet space race, a new emphasis was placed on science education in the United States. As part of the curricular and textbook reforms that occurred in the early 1960s, evolutionary theory was added back into high school biology textbooks. In Arkansas, the adoption of such a revised textbook produced a clash with the law prohibiting the teaching of evolution that had been adopted more than three decades earlier. This clash resulted in the U.S. Supreme Court's first decision regarding the constitutionality of antievolution laws, when in *Epperson v. Arkansas* it held that the State's law

<sup>87.</sup> See Scopes v. State, 289 S.W. 363, 363 (Tenn. 1927) (finding that Scopes was indicted for "teach[ing] . . . that man had descended from a lower order of animals").

<sup>88.</sup> See id. at 367 ("Since a jury alone can impose the penalty this act requires, and as a matter of course no different penalty can be inflicted, the trial judge exceeded his jurisdiction in levying this fine, and we are without power to correct his error. The judgment must accordingly be reversed.").

<sup>89.</sup> LARSON, supra note 82, at 84-88.

<sup>90.</sup> Cf. id. at 85 ("Shipley estimated that . . . 70 percent of public high schools omitted teaching evolution.").

<sup>91.</sup> See id. at 91 ("Sputnik captured the attention of the American people, creating widespread support for improving science education.").

<sup>92.</sup> See id. at 95 ("[T]he BSCS texts successfully reintroduced evolution as the central concept in biology instruction during the early 1960s.").

<sup>93.</sup> See generally Epperson v. Arkansas, 393 U.S. 97 (1968).

<sup>94. 393</sup> U.S. 97 (1968).

prohibiting the teaching of evolution violated the Establishment Clause of the First Amendment. The Court reasoned that Arkansas's law had been improperly motivated by religious protectionism—a desire to suppress the teaching of a scientific theory that appeared to conflict with a sectarian religious belief (i.e., the literal truth of the Book of Genesis). Evidence cited by the Court in support of its decision included political advertisements that were run to urge the adoption of the Arkansas law that equated evolutionary teachings with an atheistic worldview. 97

The Epperson decision caused fundamentalist groups to rethink their tactics, but not their goal of opposing the teaching of evolution in the public schools. Thus, they reasoned, if they could not get evolutionary teaching banned they could at least mandate equal time for the teaching of their favored version of human origins whenever evolutionary theory was taught. At first this took the form of requiring the Genesis narrative to be presented in textbooks whenever evolution was, but a federal appeals court quickly dispatched a Tennessee law to this effect as a violation of the Establishment Clause. 98 Realizing that a direct teaching of Genesis, even as a counterpart to a presentation of evolutionary theory, looked too much like teaching religion. the focus then shifted to mandating equal time for the presentation of "creation science"—purported scientific evidence supporting the Genesis origins account—along with evolutionary teaching. In 1982, Arkansas's law along these lines was struck down by a federal district court in a decision noted for the thoroughness of its analysis. In McLean v. Arkansas Board of Education, 99 the court held that the law violated the Establishment Clause in several respects: it was motivated by an improper purpose to advance fundamentalist Christianity, it had a primary effect of advancing that religion in significant part because creation science was not real science and therefore lacked any

<sup>95.</sup> U.S. CONST. amend. I ("Congress shall make no law respecting an establishment of religion . . . ."); *Epperson*, 393 U.S. at 109.

<sup>96.</sup> See Epperson, 393 U.S. at 107–10 (concluding that "[t]he law's effort was confined to an attempt to blot out a particular theory [of the origin of man] because of its supposed conflict with the Biblical account, literally read").

<sup>97.</sup> Id. at 108 n.16.

<sup>98.</sup> See Daniel v. Waters, 515 F.2d 485, 489 (6th Cir. 1975) (invalidating the law in part for giving preferential treatment to the Genesis account by excluding it from the requirement that all textbook account of origins be expressly labeled as "theories" and not presented as "scientific facts"), remanded to 399 F. Supp. 510 (M.D. Tenn. 1975).

<sup>99.</sup> See McLean v. Ark. Bd. of Educ., 529 F. Supp. 1255, 1272–73 (E.D. Ark. 1982) (holding that statute requiring public schools to give balanced treatment to creation science and to evolution science violated the First Amendment prohibition against establishment of religion).

educational value, and because any teaching of creation science would necessarily create an excessive entanglement between the State and religion. Notably, in reaching its conclusions, the *McLean* court also cited evidence of fundamentalist beliefs that acceptance of evolutionary theory was tantamount to accepting an atheist or materialistic account of existence. 101

In 1987, five years after *McLean*, Louisiana's "equal time for creation science" law was taken up by the Supreme Court in *Edwards v. Aguillard*. Finding that "creation science" was essentially a religious viewpoint embodying the concept that a supernatural being created humankind, and by implication not a true scientific theory, the Court determined that the Louisiana legislature's purpose in passing the law was to advance a religious belief. As such, the Court held that the law violated the Establishment Clause. Once again, like the courts in *Epperson* and *McLean*, in reaching its conclusion the Court cited evidence that the law's supporters essentially equated evolutionary theory with atheism and a materialistic worldview. Not surprisingly, *Edwards* essentially sounded the death knell for laws requiring the joint teaching of creation science with evolution.

Thus, in mediating the contest between creationism and evolution, the law started out in the 1920s favoring the former by banning the latter, and then

<sup>100.</sup> See id. at 1272 (concluding statute fails three-pronged establishment test).

<sup>101.</sup> See id. at 1266 ("The approach to teaching 'creation science' and 'evolution science' found in Act 590 is . . . an extension of Fundamentalists' view that one must either accept the literal interpretation of Genesis or else believe in the godless system of evolution."); id. at 1266 n.22 (noting that advocates of teaching creation science insisted "a true Christian cannot compromise with the theory of evolution"); see also id. at 1259–61 (tracing the roots of fundamentalism and creation science).

<sup>102. 482</sup> U.S. 578 (1987).

<sup>103.</sup> See id. at 593 ("In this case, the purpose of the Creationism Act was to restructure the science curriculum to conform with a particular religious viewpoint."); see also Kitzmiller v. Dover Area Sch. Dist., 400 F. Supp. 2d 707, 720 (M.D. Pa. 2005) ("The courts in Edwards and McLean expressly found that [the involvement of a supernatural designer] removed creationism from the realm of science and made it a religious proposition.").

<sup>104.</sup> See Edwards, 482 U.S. at 597 ("The Act violates the Establishment Clause of the First Amendment because it seeks to employ the symbolic and financial support of government to achieve a religious purpose.").

<sup>105.</sup> See id. at 591 n.13 (noting legislator's view that the world is either created by a creator or that it "just evolves"); id. at 592 ("According to Senator Keith, the theory of evolution was consonant with the 'cardinal principle[s] of religious humanism, secular humanism, theological liberalism, aetheistism [sic]."); id. at 592 n.14 (recounting legislator's personal belief in creationism and his view that the battle over the bill was one between "God and anti-God forces").

<sup>106.</sup> See, e.g., Kitzmiller, 400 F. Supp. 2d at 718 ("Therefore, as noted, the import of Edwards is that the Supreme Court made national the prohibition against teaching creation science in the public school system.").

from the 1960s through 1980s, essentially did an "about face" in favoring the latter by banning the former. In the 1990s through today, however, the law, through the vehicle of general educational reforms, has gone even further in favoring evolutionary theory. Such reforms effectively require that evolution be taught in public schools through the conditioning of federal education funding on the adoption of state education standards and associated testing requirements where those standards generally provide for teaching that theory. But these developments by no means diminished the fervor of groups opposed to an uncritical presentation of evolutionary theory to middle and high school science students. They did, however, cause them to rethink their strategies for accomplishing their goals.

#### C. Phase Two: Intelligent Design Attacks Science

While the *Edwards* case was pending, a group of scientists who believed in some version of creation were working on a high-school biology textbook supplement that purported to make a scientific case that purposeful creation better explained scientific data related to living systems than an unguided process of natural selection. After the Court's decision issued, the authors substituted the phrase "intelligent design" for the now legally-suspect term "creation" in their manuscript (and the phrase "design proponents" for the term "creationists"), and published the book under the title *Of Pandas and People: The Central Question of Biological Origins*. <sup>109</sup> Thus, the intelligent design movement was formally born in its modern incarnation. <sup>110</sup> That movement

<sup>107.</sup> LARSON, supra note 82, at 196-209.

<sup>108.</sup> See, e.g., id. at 202 (describing "scattered state skirmishes" over science standards following national standards legislation).

<sup>109.</sup> PERCIVAL DAVIS & DEAN H. KENYON, OF PANDAS AND PEOPLE: THE CENTRAL QUESTION OF BIOLOGICAL ORIGINS (1989); see also Kitzmiller v. Dover Area Sch. Dist., 400 F. Supp. 2d 707, 721–22 (M.D. Pa. 2005) (explaining how the textbook was initially drafted as a creationist text).

design," the general lines of the argument for purposeful design of the universe have deeper historical roots. Modernly, the 1984 book *The Mystery of Life's Origin* attributed the complex process of originating life to a divine creator. *See* RONALD L. NUMBERS, THE CREATIONISTS 373 (expanded ed. 2006) (noting work of three Protestant scientists attributing origination of life to divine creator). This book, along with Michael Denton's *Evolution: Theory in Crisis*, attracted little public attention, but helped to lay the intellectual foundation for the modern ID movement. *See id.* at 373–74 (tracing the development of intelligent design). However, the idea that nature is designed is older than any of these modern creationist articulations. The medieval philosopher and theologian Thomas Aquinas argued, as one of his five ways to philosophically demonstrate the existence of God, that wherever complex design exists, there must have been a

gained significant momentum after the 1991 publication of a book by a Berkeley law professor, Phillip Johnson, entitled Darwin on Trial. 111 In it. Johnson applied his legal reasoning skills to take issue with a basic scientific concept that he apparently believed was responsible for a trend towards philosophical materialism in the scientific community—science's commitment to methodological naturalism, or investigating and explaining natural phenomenon solely as a matter of naturalistic causes or processes. 112 Johnson's view, scientific theories or explanations about the natural world ought to make room for supernatural causation if that best explains the scientific data—and particularly causation by an intelligent designer. 113 To Johnson, it was critical to stem the scientific and cultural drift towards a purely materialistic view of existence with its perceived detrimental impact on society and culture, and to reverse its course back towards a theistic view of life and its central premise that there is a supernatural creator—regardless of whether creation happened in seven days or a much longer time through the evolutionary process. 114

In addition to pushing this critique of methodological naturalism to combat the philosophical naturalism or materialism of many scientists that Johnson believed was seeping into mainstream scientific theories and explanations of natural phenomena—and especially the neo-Darwinian evolutionary synthesis—Johnson also assembled a group of younger Christian academics, some of whom held advanced scientific degrees, to assist him in moving science towards a greater receptivity of "intelligent design" explanations for natural phenomena. Some in this group secured funding to start a center designed to promote intelligent design—called the Center for the Renewal of Science and Culture ("CRSC"), a unit of a Seattle-based think tank

designer. See Kitzmiller, 400 F. Supp. 2d at 718 (noting testimony of theologian explaining connection between intelligent design and theology of Thomas Aquinas). William Paley's Natural Theology, published in 1802, argued that just as a watch's complexity (as contrasted with a stone) naturally leads one to infer a designer, so too complexity in natural objects points to a designer of nature. See Kenneth R. Miller, Only a Theory: Evolution and the Battle For America's Soul 21 (2008) (discussing William Paley's watch and stone analogy). For a more complete discussion of the ID movement's intellectual predecessors, see id. at 20–24.

<sup>111.</sup> PHILLIP E. JOHNSON, DARWIN ON TRIAL (1991).

<sup>112.</sup> Id. at 114-16.

<sup>113.</sup> Id. at 110, 154.

<sup>114.</sup> See Kitzmiller, 400 F. Supp. 2d at 719–20 (describing Johnson as the developer of ID's so-called "Wedge Strategy," and its aim "to defeat scientific materialism and its destructive moral, cultural, and political legacies and to replace materialistic explanations with the theistic understanding that nature and human beings are created by God") (citations omitted).

<sup>115.</sup> See Numbers, supra note 110, at 380 (describing Johnson's growing organization of intelligent design theorists).

called the Discovery Institute—that most of these academics, including Johnson, became affiliated with. Two members of the group that have been particularly influential in attempting to promote intelligent design as a scientific theory are Lehigh University biochemistry professor Michael Behe and Southern Baptist Theological Seminary mathematician and philosophy professor William Dembski.

In his 1996 book Darwin's Black Box: The Biochemical Challenge to Evolution, 117 Behe puts forth the argument of "irreducible complexity" to criticize Darwinian evolution and support intelligent design. Behe points out that the neo-Darwinian evolutionary mechanism of natural selection posits random genetic mutations in an individual that cause anatomical changes which are gradually taken up by his or her progeny, and then a wider population, when they confer reproductive advantages or survival value on organisms. 118 From time to time, according to that theory, these changes eventually reach a point when new species are created. 119 Behe, however, argues that the origins of some complex life forms existing today cannot be explained by such a process.<sup>120</sup> Like a mousetrap, he argues, some life forms comprised of interacting parts do not function (or confer benefits or survival value) until all of those parts are in place to operate together. 121 When the parts standing alone had no independent functional or survival benefit—as with a typical mousetrap—they could not have developed under a natural selection mechanism because they would have had no value to be incorporated into a population in the first place. 122 In other words, organisms or life processes exhibiting irreducible complexity—when multiple parts have to be in place before they function (and when the loss of a part will cause nonfunctionality)—cannot evolve under natural selection when those parts have no separate and independent survival value. Behe claims this is the case with

<sup>116.</sup> See id. at 381-82 (recounting creation of Center for the Renewal of Science and Culture).

<sup>117.</sup> MICHAEL J. BEHE, DARWIN'S BLACK BOX: THE BIOCHEMICAL CHALLENGE TO EVOLUTION (1996).

<sup>118.</sup> See id. at 4 (explaining neo-Darwinist theory).

<sup>119.</sup> See id. at 26 (noting idea that formation of new species is achieved through accumulation of mutations).

<sup>120.</sup> See id. at 187 (arguing scientists are unable to give a detailed account of how certain complex biological processes may have developed in a Darwinian fashion).

<sup>121.</sup> See id. at 42 (explaining mousetrap analogy).

<sup>122.</sup> See id. at 46–47 (arguing intact systems are irreducibly complex and cannot be created by unconscious, small, successive steps).

many complex organisms or biochemical processes he has studied.<sup>123</sup> Therefore, an intelligent designer is the best explanation for their origins.<sup>124</sup>

As one might expect from a mathematician. Dembski makes a related but different argument for an intelligent designer that is grounded in that particular discipline. In his 1998 book The Design Inference: Eliminating Chance Through Small Probabilities<sup>125</sup> and other writings. Dembski relies on information and probability theory to argue that important biochemical molecules, such as DNA, contain informational sequences or patterns that exhibit both "complexity" and "specificity" that would be improbable results of chance or the operation of natural laws. 126 By "complexity," Dembski is referring to the exhibition of irregular sequences of information unlikely to occur at random; <sup>127</sup> he defines "specified" as referring to a correlation between patterns of information contained in such sequences and independent functional requirements (e.g., the sequence performs a function such as communicating information). 128 To illustrate, Dembski argues that "[a] single letter of the alphabet is specified without being complex. A long sentence of random letters is complex without being specified. A Shakespearean sonnet is both complex and specified." Thus, when molecules or other living things contain systems or sequences exhibiting both complexity and specificity (i.e., "specified complexity"), it is highly likely that they were purposely designed instead of being the result of chance or the operation of unguided forces. 130

Although intelligent design proponents currently do not claim to advocate the direct teaching of intelligent design as science in the public schools<sup>131</sup>—at

<sup>123.</sup> See id. at 204-05 (suggesting cilium, the blood-clotting system, and intracellular transport systems as examples of complex systems that support the inference that they are products of design).

<sup>124.</sup> See id. at 193 ("The conclusion of intelligent design flows naturally from the data itself—not from sacred books or sectarian beliefs.").

<sup>125.</sup> WILLIAM A. DEMBSKI, THE DESIGN INFERENCE: ELIMINATING CHANCE THROUGH SMALL PROBABILITIES (1998)

<sup>126.</sup> See, e.g., WILLIAM DEMBSKI & JONATHAN WELLS, THE DESIGN OF LIFE: DISCOVERING SIGNS OF INTELLIGENCE IN BIOLOGICAL SYSTEMS 168–75 (2008) (defining specified complexity and discussing its implications for molecular biology).

<sup>127.</sup> Id. at 165.

<sup>128.</sup> Id. at 174.

<sup>129.</sup> WILLIAM A. DEMBSKI, INTELLIGENT DESIGN: THE BRIDGE BETWEEN SCIENCE AND THEOLOGY 47 (1999).

<sup>130.</sup> See, e.g., DEMBSKI & WELLS, supra note 126, at 180–83 (contrasting the design theory explanation of irreducibly complex systems to Darwinist explanations).

<sup>131.</sup> See, e.g., http://www.discovery.org/csc/topQuestions.php (last visited Mar. 9, 2009) (answering the question "Should public schools require the teaching of intelligent design?") (on file with the Washington and Lee Law Review).

least unless and until they achieve some success in getting the scientific community to change the ground rules of science to include supernatural explanations of natural phenomena, which is one goal they have set for themselves—they have adopted a strategy of claiming there is a "controversy" relating to the validity of neo-Darwinian theory (based in part on Behe's and Dembski's criticisms) and advocate that schools teach that controversy (including, potentially, alternative explanations based on intelligent design) when evolution is covered in science class. A few school boards and individual biology teachers that have attempted to implement this recommendation have so far met with little success, being stymied by political backlashes or legal actions reflecting strong opposition of the scientific community to the notion that there is any controversy to teach about evolutionary theory. 133

In one of the earliest attempts to alert students to such a controversy, in 1994 a school district in Louisiana adopted a policy requiring that a "disclaimer from endorsement" of evolutionary theory be read to students prior to that theory's presentation. <sup>134</sup> In pertinent part, that disclaimer advised students that evolutionary theory "should be presented to inform students of the scientific concept and not intended to influence or dissuade the Biblical version of Creation or any other concept." A federal court of appeals held that the disclaimer violated the Establishment Clause because its primary effect was to advance a particular religion (i.e., Christianity). Interestingly, on appeal to the Supreme Court, two Justices that dissented in *Edwards*, joined by another Justice that had not been on the Court then, voted to grant certiorari in the case, but came up one vote short. Nonetheless, they filed a vigorous dissent to the denial of the appeal, accusing the other members of the Court of standing by and permitting "a Court of Appeals to push the much beloved secular legend of

<sup>132.</sup> See infra note 268 and accompanying text; see also LARSON, supra note 82, at 202-05.

<sup>133.</sup> NUMBERS, supra note 110, at 386–98 (describing little actual success for the "teach the controversy" strategy, but noting that ID proponents have scored a significant public relations victory in "convincing the public and press that a serious science controversy exist[s] about the status of Darwinism."); see also LARSON, supra note 82, at 205–09.

<sup>134.</sup> See Freiler v. Tangipahoa Parish Bd. of Educ., 185 F.3d 337, 341 (5th Cir. 1999) (enjoining school board from requiring disclaimer be read before teaching evolution).

<sup>135.</sup> Id.

<sup>136.</sup> See id. at 348 ("As such, we conclude that the disclaimer impermissibly advances religion, thereby violating the second prong of the *Lemon* test as well as the endorsement test.").

<sup>137.</sup> See Tangipahoa Parish Bd. of Educ. v. Freiler, 530 U.S. 1251, 1251 (2000) (Scalia, J., dissenting) (opposing denial of certiorari) (criticizing Fifth Circuit's application of the *Lemon* test). Chief Justice Rehnquist and Justice Thomas joined Scalia in dissenting from the denial, leaving that group one vote short of the four necessary for the Court to grant certiorari in a case.

the Monkey Trial one step further."<sup>138</sup> Today, only nine years later, a more conservative Court may very well have heard the case and reversed the lower court's decision. Thus, it is very possible that the Court may bust ajar the door *Edwards* closed to teaching some version of the purported "controversy" over evolution in the near future.

In a more recent and much publicized lawsuit contesting an attempt to teach challenges to evolutionary theory that explicitly involved intelligent design, the latter ideas were subjected to direct and probing legal scrutiny for the first time. In 2004, the school board for Dover, Pennsylvania adopted a resolution decreeing that students would be made aware of "gaps/problems in Darwin's theory and of other theories of evolution including, but not limited to, intelligent design." To implement this policy, the school district announced that students in the ninth-grade biology class would be read a fairly lengthy statement that, among other things, referred to "Darwin's Theory" and proclaimed that "[t]he Theory is not a fact. Gaps in the Theory exist for which there is no evidence . . . . Intelligent Design is an explanation of the origin of life that differs from Darwin's view. The reference book, *Of Pandas and People*, is available for students who might be interested in gaining an understanding of what Intelligent Design actually involves."

Upon a challenge to these actions, a federal district court held that they violated the Establishment Clause for several reasons. First, after reviewing evidence tying intelligent design to creationist ideas and groups, and the school board actions undertaken in adopting the challenged policy, the court determined the board appeared to be endorsing religion by adopting it. <sup>141</sup> In addition, the court concluded that the policy impermissibly endorsed religion because intelligent design was a religious argument rather than a legitimate scientific theory. <sup>142</sup> Finally, the court held that in adopting the policy the school board had an unconstitutional purpose and effect of imposing "a religious view of biological origins into the biology course." <sup>143</sup> Similar to cases involving creationism, in making its determination regarding the religious nature of intelligent design theory, the court cited evidence indicating that its

<sup>138.</sup> Id. (Scalia, J., dissenting).

<sup>139.</sup> Kitzmiller v. Dover Area School Dist., 400 F. Supp. 2d 707, 708 (M.D. Pa. 2005).

<sup>140.</sup> Id. at 708-09.

<sup>141.</sup> See id. at 734-35 (concluding average member of community would perceive school board's actions to be an endorsement of religion).

<sup>142.</sup> See id. at 718-23 (tracing intelligent design's origins to theological arguments).

<sup>143.</sup> Id. at 746-64.

proponents were motivated strongly by the perceived materialistic and atheistic beliefs of scientists and others who promote or accept Darwinian evolution. 144

Even before the district court's decision in *Kitzmiller* was issued, citizens of Dover who were annoyed at becoming the locale of a modern "Scopes monkey trial" voted the school board proponents of the new policy out of office. Thus, it is not clear what the future holds for the intelligent design movement, but particularly in light of the three-Justice dissent to the denial of certiorari in the Louisiana disclaimer case, and the recent increase in solidly conservative Justices on the Court, it seems clear that one district court decision will not destroy the movement or even detain it for long. Moreover, it is likely that even traditional creationists have taken heart from the Louisiana case, and will continue efforts designed to "teach the controversy" from a Biblical perspective. Indeed, all evidence indicates that creationism is again on the rise in America, and even gaining an increasing number of adherents at an international level. 146

### D. Phase Three: Science's Assault on the Religious Worldview

Perhaps sensing that creationists and intelligent design proponents will not be throwing in the towel anytime soon, in the last couple of years a number of avowed atheist authors—including those trained in science and those possessing other backgrounds—have launched a major and vehement

<sup>144.</sup> See id. at 720 (citing proponents' document referring to the "destructive moral, cultural and political legacies" of scientific materialism, and the need to "replace materialistic explanations with the theistic understanding that nature and human beings are created by God"); see also id. at 729–31 (describing ID proponents' claims about atheistic implications of evolution); id. at 737 (quoting governing goals of the think tank supporting intelligent design as being to replace materialistic explanations on origin of humans); id. at 737 n.14 (noting the strategic plan of intelligent design advocacy group explained the "devastating" effects materialism has had); id. at 762 (stating that opponents to the intelligent design curriculum had been called atheists).

<sup>145.</sup> See NUMBERS, supra note 110, at 393 ("[T]he citizens of Dover, irritated at becoming the Dayton of the North, went to the polls and voted out of office all of the old Pro-ID schoolboard members.").

<sup>146.</sup> See id. at 399–431; id. at 399 ("In the past few decades [antievolutionism] has quietly spread from America throughout the world and from evangelical Protestantism to Catholicism, Eastern Orthodoxy, Islam, Judaism, and even Hinduism."); see also Jens Lubbadeh, European Creationists Take on Darwin, Spiegel Online, Feb. 25, 2009, http://www.spiegel.de/international/zeitgeist/0,1518,609712,00.html (last visited Apr. 16, 2009) ("The US isn't the only place with heated debates about Darwin's theory of evolution: Europe has its own hardcore creationists and intelligent design backers, too. Increasingly, they are making their voices heard.") (on file with the Washington and Lee Law Review).

counteroffensive to put them, and religionists in general, on the defensive. 147 At least five such books have reached various bestsellers' lists since 2005. 148 The leader of these authors is Richard Dawkins, an Oxford professor trained in zoology but who has spent most of his professional life writing books critical of religion and arguing that Darwinian evolution, as well as other modern scientific advances, support a wholly materialistic view of existence. 149 In his 2006 book, *The God Delusion*, Dawkins elaborates on these arguments, hoping with his new book to take advantage of, as he sees it, a potential "critical mass for the initiation of a chain reaction" for "coming out of the closet" and revealing oneself as the atheist he or she truly and most logically is. 150

As might be predicted, these books have prompted others—again, including those with and without scientific training—to respond with books of their own. The leading response by a practicing scientist comes from Francis Collins, the former head of the U.S. Government's National Human Genome Research Institute, in his 2006 book *The Language of God: A Scientist Presents Evidence for Belief.* In it, Collins aims to counter the Dawkinsian view "that a belief in evolution demands atheism" and to provide a "synthesis of the scientific and spiritual worldviews" by arguing that "belief in God can be an entirely rational choice, and that the principles of faith are, in fact, complementary with the principles of science." And if all of these recent books on the materialism-theism divide constitute a landslide of debate, the reactions of the mainstream media represent no less than an avalanche. The

<sup>147.</sup> See, e.g., Rachel Zoll, Atheists in the Bully Pulpit; Many Books Decrying Religion's Negative Influence on the World Are Bestsellers, L.A. Times, May 26, 2007, at E12 (asserting that "[m]ilitant, atheist writers are making an all-out assault on religious faith and reaching the top of the bestseller list, a sign of widespread resentment over the influence of religion in the world among nonbelievers").

<sup>148.</sup> See, e.g., Ronald Aronson, The New Atheists; A Wave of Pugnacious Unbelievers Have Written Must-Read Books for Americans Fed Up with In-Your-Face Religion, CHI. SUN TIMES, June 17, 2007, at B1 ("No fewer than five books by the New Atheists have appeared on best-seller lists in the past two years . . . . ").

<sup>149.</sup> See, e.g., COLLINS, supra note 20, at 4 ("[T]he prominent evolutionist Richard Dawkins has emerged as the leading spokesperson for the point of view that a belief in evolution demands atheism.").

<sup>150.</sup> DAWKINS, supra note 17, at 4.

<sup>151.</sup> See, e.g., Lisa Anderson, A Firestorm over Plans to Teach Intelligent Design, CHI. TRIB., Feb. 4, 2007, Books, at 6; David P. Barash, The DNA of Religious Faith, CHRON. HIGHER EDUC. (Wash., D.C.), Apr. 20, 2007, at B6.

<sup>152.</sup> See COLLINS, supra note 20, at 3 (advocating the compatibility of a belief in God with a belief in biological evolution).

<sup>153.</sup> Id. at 4.

<sup>154.</sup> Id. at 3.

reporting on, and review of, these books has been vigorous, and few subjects have prompted so many op-ed columnists and other media voices to join the fray.<sup>155</sup>

In sum, it is evident that the BIG QUESTION posed at the start of this Article strikes a deep and enduring chord in our society—within individual citizens and in our culture in general. As we have seen, the differing answers to that question have spurred vigorous philosophic, scientific and cultural debate since the dawn of Western civilization, and it shows no indication of easing in the modern age. 156 If anything, as evolutionary biologists and neuroscientists increasingly assert claims that human behaviors, emotions and thoughts-indeed, human religious convictions-can be explained through entirely natural processes, this debate only promises to strengthen and become more entrenched (and, unfortunately, more acrimonious).<sup>157</sup> That is not surprising, for as Francis Collins asserts in The Language of God, "[w]hether we call it by name or not, all of us have arrived at a certain worldview. It helps us make sense of the world around us, provides us with an ethical framework, and guides our decisions about the future." 158 As Collins suggests, the difference between materialistic and theistic worldviews can be critical to a person's approach to life. 159 In a created universe, one is logically accountable for his or her life to the Creator that brought him or her into existence. This means that such a person's life will likely be meaningfully influenced by his or her views of what that Creator expects or demands—whether or not others might view those expectations or demands as being good or evil. In a universe governed solely by mechanistic processes, one is logically accountable to the dictates of one's own conscience—and to whatever influences have helped to shape and mold it—to guide and assess the value and meaning of one's life. Either way, it is clear that one's beliefs about the nature of human origins can be fundamental to his or her view of life and existence.

<sup>155.</sup> See, e.g., Julia Keller, Atheists, Let the Mystery Be; Why Do the Writers of Recent Popular Books on Atheism Fume over Others' Beliefs? Why Not Shake Your Head and Move On?, L.A. TIMES, Jan. 2, 2008, at E13 (responding to the recent books on the materialism-theism divide by asking materialists to "let the mystery be"); Lee Siegel, Op-Ed., Do We Need Faith? Believe It; A Flurry of Literary Attacks on God May Also Be Closing the Book on Imagination, L.A. TIMES, Oct. 7, 2007, at M8 (advocating the necessity of faith in the face of materialism); Aronson, supra note 148 (reporting the success of materialistic novels); Peter Steinfels, Books on Atheism Are Raising Hackles in Unlikely Places, N.Y. TIMES, Mar. 3, 2007, at B5 (reporting on current conflicts highlighted by the success of materialist novels).

<sup>156.</sup> See supra Part II.A (tracing the history of the debate from the ancient Greeks).

<sup>157.</sup> See supra note 17 and accompanying text (noting the works of the so-called "four horsemen").

<sup>158.</sup> COLLINS, supra note 20, at 6; supra notes 21-22 and accompanying text.

<sup>159.</sup> COLLINS, supra note 20, at 6.

It is not surprising, then, that there are parents and others who are concerned about, and even seek to influence, what our youths are taught about such a matter given its potential to shape worldview development—and particularly as it is taught within public education because this is one of our main institutions for preparing individuals for life as adults and for participation in civil society. In particular, one can understand concerns that the only account of human origins public school students normally receive is a purely naturalistic one in the science classroom. This is especially true because many parents, and certainly most high school students, do not appreciate the fact that such a presentation is not intended to slight non-scientific perspectives on this issue but rather is the result of what science is—a method for explaining what happens in the natural world by reference to evidence gained from it that can be widely tested and verified.

Once this is explained and understood, however, one might expect the response of those concerned to be: "All right. Then let's make sure students understand the specialized nature of the scientific inquiry, and teach them additional perspectives on origins in a class more suitable to that purpose." But as the American litigation experience with creationism and intelligent design indicates, this has not been the general response. This raises the question of why this is so: Why have creationism and intelligent design proponents been so insistent that alternative origins accounts be taught as science, or at least discussed in the science classroom? And given this insistence, even if the Court were to open the door from an Establishment Clause perspective to teaching a purported controversy about evolution in science courses, would it go so far as to permit creationist or intelligent design critiques of that theory in the context of a science class? The answer to this last question depends, presumably, on whether or not such critiques were deemed to be scientific. It is to both of these questions that this Article now turns.

<sup>160.</sup> See, e.g., GREENAWALT, supra note 25, at 23 ("Clearly, American education serves multiple, overlapping objectives. These include developing the vocational skills of students, their capacity for choice, their ability to participate in enriching activities, their civic virtue, and their moral character.").

<sup>161.</sup> See, e.g., NAT'L COMM. ON SCI. EDUC. STANDARDS & ASSESSMENT, NAT'L RESEARCH COUNCIL, NATIONAL SCIENCE EDUCATION STANDARDS 181-86 (1996) (emphasizing the importance of improving educational methods to teach evolution and natural selection as a life science).

<sup>162.</sup> See supra Parts II.B & II.C (outlining America's litigation experience with creationism and intelligent design).

## III. The Future of Creationism and Intelligent Design in the Science Classroom, and the Proper Place To Teach Origins in the Public School Curriculum

## A. Why Insistence on Teaching Religion as Science?

As described earlier, creationism proponents, and more recently intelligent design proponents, have waged expensive and time-consuming litigation to either have their version of human origins taught alongside evolution in science courses, or at least to have the teaching of the latter qualified by disclaimers alerting students to its "theoretical" nature and to alternative explanations for human origins. 163 But since the Supreme Court said early on, at least in dicta, that there is no Establishment Clause problem with teaching students about religious doctrines and beliefs rather than teaching them as true (informing versus persuading), one might wonder why they have not focused on teaching their alternative origins perspectives in non-science classes instead of waging costly and protracted battles over what is presented in science class. 164 There are a number of possible explanations for this. For creationists, it might simply be a matter of inertia. Since the subject of evolution arose as science and was taught as such, they targeted their initial successful efforts to ban the subject in that course. 165 When Epperson was decided and thwarted that tactic, inertia dictated continuing to fight the battle in that course by mandating equal time for their origins accounts. 166 However, historical circumstance does not explain the targeting of science and its teachings by intelligent design proponents (in fact, after Edwards, one would have thought this strategy might be very difficult if not self-defeating), and one suspects more was motivating the creationist strategy as well.

Indeed, another explanation for the "science strategy," at least for intelligent design proponents and the "creation science" efforts of creationists, is that they truly believe their origins theories and evidence are scientific.<sup>167</sup>

<sup>163.</sup> See supra notes 99-106, 134-45 and accompanying text (summarizing creationists' unsuccessful attempts to mandate equal time in the classroom for creation science in *McLean* and *Edwards* and religionists' unsuccessful attempts to mandate disclaimers in *Freiler* and *Kitzmiller*).

<sup>164.</sup> See infra note 329 and accompanying text (noting the Court's intimation in Lynch v. Donnelly, 465 U.S. 668 (1984), that teaching about religion is constitutional).

<sup>165.</sup> See supra note 86 and accompanying text (describing creationists' attempts to criminalize teaching evolution and pressure public educators to avoid the subject).

<sup>166.</sup> See supra notes 94–98 and accompanying text (discussing Epperson and creationists' subsequent attempts to mandate equal time).

<sup>167.</sup> See, e.g., supra notes 115-30 and accompanying text (discussing the purportedly

Certainly both groups tried to make this case in *Edwards* and *Kitzmiller*, respectively, where the courts, at least, did not think they succeeded. And as I will discuss later, given the nature of their arguments along these lines, both groups must have entertained—and probably still do—at least some doubt about the merit of those contentions when viewed in the light of conventional understandings about the nature of the scientific enterprise in this country. Maybe an even more plausible explanation is that, as indicated above, under the Court's Establishment Clause jurisprudence religious views cannot be taught as truth while scientific views can. This in itself may seem a little odd at first, but given the nature of the religious and scientific enterprises that will be discussed in more detail later, it is understandable.

Science is a method for obtaining a wide, objective consensus on "some" truth—truth about the physical and social worlds based on the study and verification of empirical evidence.<sup>171</sup> So in teaching science as at least part of the "truth portrait," educators stand on relatively firm ground. Religion, on the other hand, most commonly refers to a personal or institutionalized set of beliefs in a *super*natural being and reality.<sup>172</sup> By definition, the supernatural generally refers to purported non-material realities that cannot be detected through empirical observation or sensory perceptions.<sup>173</sup> Thus, although many claim that religion can lead to truths about spiritual or other non-material planes of reality, such truths are normally accessed through asserted divine revelation (at the level of organized religion) or an individual's experiences, insights and interpretations of them (at a more personal level). As such, religion is not a standardized methodology to be followed in order to achieve wide consensus on certain truths, but rather is a description for a set of beliefs (no matter how acquired) that tend to be much more varied and subjective in nature.<sup>174</sup> There

scientific theories of ID proponents Behe and Dembski).

<sup>168.</sup> See supra notes 102–06, 139–44 and accompanying text (discussing Edwards and Kitzmiller, respectively, at greater length).

<sup>169.</sup> Supra note 36 and accompanying text.

<sup>170.</sup> See infra Part III.B (discussing the nature of the religious and scientific enterprises).

<sup>171.</sup> See infra notes 180-90 and accompanying text (providing a definition for the scientific enterprise).

<sup>172.</sup> See, e.g., MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY 1051 (11th ed. 2006) (defining "religion" as "the service and worship of God or the supernatural").

<sup>173.</sup> Cf. Davis & Collins, supra note 54, at 203 ("[A] largely unspoken rule in both the sciences and the humanities is that, insofar as one attempts to explain human behavior or beliefs, they must be explained by natural causes, not by appealing to such things as an immaterial soul or a transcendent ethical or supernatural order . . . . ").

<sup>174.</sup> Cf. Meyer, supra note 78, at 17 ("According to both [Kierkegaard and Buber], scientific knowledge is impersonal and objective, whereas religious knowledge is personal and subjective . . . . Religion . . . involves a personal relationship with the object known (God) and

may indeed be, as religionists contend, other planes of objective reality in addition to the world of matter and energy, but our "tools" for accessing such planes are not as readily available to us as our physical senses are for accessing the latter world. Hence, there tends to be much more personal experience and interpretation involved in getting at the truths of such realities, and much more difficulty achieving consensus about what those truths are (at least as compared to scientific truths). That is essentially why the law permits science to be taught as truth under the aegis of government authority or endorsement, but bars religious views from being so taught—and to allow individuals maximum freedom to decide upon religious truths for themselves.

Thus, it may be that when creationists and intelligent design advocates target science classes for the teaching of their origins perspectives, they are seeking to gain a piece of this institutionalized or established truth monopoly. This point is related to, and leads to, probably the most compelling explanation for such targeting. In the eyes of many religionists, ever since the Enlightenment purportedly rescued human inquiry and knowledge from the asserted "chains" placed upon it by institutionalized religious authority, scientific inquiry and knowledge have enjoyed a distinct prestige or prominence in Western thought that is suggested by the rhetoric of "enlightenment." Hence, whatever knowledge is gained scientifically is treated as being epistemologically superior to knowledge gained through religious experience or revelation. After all, many contend, scientific knowledge has allowed humans to visit the moon, eradicate disease, and produce the wonders of the

a personal or moral response to him. Therefore, radical subjectivity characterizes religious endeavor.").

<sup>175.</sup> See, e.g., Mortimer J. Adler, The Four Dimensions of Philosophy 49 (1993). Adler states:

We live in a culture in which science, along with its applications in ever more powerful technology, predominates. The glorification and adulation of science give the word "scientific" its eulogistic connotation. Other forms of intellectual endeavor call themselves "scientific" when, in fact, their mode of inquiry, which may be investigative, is not scientific at all in method or aim. The adjective "scientific" has almost become a synonym for "excellent"—for "trustworthy" and "reliable."

Id.

<sup>176.</sup> See, e.g., Suppe, supra note 45, at 24–29 (observing that "[i]n recent generations, the understanding [of reality] that religion provides has been increasingly stigmatized as inferior to that of science. Where the two clash, religious understanding has usually suffered, for religious beliefs are frequently taken to be merely matters of faith, whereas science is said to yield knowledge," but also concluding that "[c]ontemporary debates over the compatibility of science and religion have been poorly informed by the epistemology literature—a literature that gives little consolation to those who seek to find radical disparities in the qualities of knowledge that religion and science are capable of providing.").

technological age—in short, it has permitted humankind to understand, control, and alter the material world for its benefit.<sup>177</sup> What religious forms of knowledge have ever produced such practical and useful benefits that impact life in such perceptible ways? As intelligent design proponent William Dembski has asserted in arguing that intelligent design should be taught as science and not religion, claims to the contrary fail "to recognize the immense cultural prestige which our society accords to science, but denies to religion.... [T]he only universally valid form of knowledge within our society is science."<sup>178</sup> In short, in the eyes of many religionists, because Western society places a higher value on scientific rather than religiously derived knowledge, the teaching of intelligent design or other religious perspectives on origins in a non-science class would represent a "surrender" to the "over-inflated role of science within our society."<sup>179</sup>

One obvious response to this last argument for insisting that creationist and intelligent design views be taught in science courses is that if they do not qualify as science, then the answer is not to attempt to alter or stretch the definition of science to include such views, but rather to persuade society of the equal or greater validity and worth of religiously-derived knowledge. But before elaborating on this potential critique of the creationist and intelligent design "science course" strategy, it is only fair to first examine whether the theories of origins and associated critiques of evolutionary theory posited by these groups and claimed to be "scientific" truly fit that appellation.

## B. Do Creationism, Intelligent Design, and Their Critiques of Evolutionary Theory Belong in the Science Classroom?

Although philosophers of science and the scientific community itself have long debated the precise nature of the scientific enterprise, simply speaking science "might be described as a set of activities designed to study or investigate a topic about the natural or social worlds using the methods of science." While just what those methods are has been part of that debate, with many engaged in the "hard" natural sciences insisting on a rigorous

<sup>177.</sup> See supra note 175; see also COLLINS, supra note 20, at 1-2 (celebrating the success of the Human Genome Project and attributing that success, in part, to scientific knowledge).

<sup>178.</sup> William A. Dembski, Teaching Intelligent Design as Religion or Science?, PRINCETON THEOLOGICAL REV., May 1996, at 14, 15.

<sup>179.</sup> Id.

<sup>180.</sup> Barry P. McDonald, Government Regulation or Other "Abridgements" of Scientific Research: The Proper Scope of Judicial Review Under the First Amendment, 54 EMORY L.J. 979, 987 (2005).

adherence to the classical "scientific method" involving "a strict protocol of hypothesis formulation and controlled experimentation," 181 today the accepted definition of science seems to be also making room for the "softer" social sciences that utilize "reliable, empirically derived data and unbiased, rigorous techniques for testing that data." In both cases, the "emphasis [is] on the systematic collection or generation of empirical data (i.e., information based on human observation of [, or experimentation with,] events or phenomena in the perceivable world) . . . [and] the utilization of unbiased and rigorous modes of testing, analysis, and evaluation to draw inferences and conclusions about those data." Such methods are designed to produce "universal" knowledge that is "testable and reliable . . . [consisting of] claims . . . about the world [that] are subject to empirical tests and . . . characterized by empirical objectivity." 184 Further, "the dissemination of scientific findings to the scientific community for [its] scrutiny and assessment [or validation] increases the legitimacy of claims that such findings constitute scientific knowledge." Accordingly, at least as to natural sciences such as biology where creationist and ID proponents are seeking to have their theories treated as science, we can say that science is a process designed to investigate the natural world in a rigorous, disciplined way. and to achieve universal consensus on objective truths regarding that world.

Such scientific *knowledge*, then, essentially consists of information and ideas—normally in the form of facts or theories—about the natural world that have been examined by scientists using such methods and accepted as the most objective and accurate description of it that is presently available. But as suggested by this definition of science, knowledge does not break down into tidy categories of being scientific or nonscientific. Rather, science is an iterative process consisting of continual investigation, analysis, and communication, where consensuses about facts or theories emerge gradually and frequently get undermined or reshaped by new discoveries and findings. Thus, instead of having black and white boundaries, knowledge becomes scientific by degrees depending on the breadth of its acceptance at any given

<sup>181.</sup> Id. at 988.

<sup>182.</sup> Id.

<sup>183.</sup> Id. at 989.

<sup>184.</sup> Id. (quotations and footnotes omitted).

<sup>185.</sup> Id. at 991.

<sup>186.</sup> See id. (listing the "main activities... essential to the production of 'scientific' knowledge," namely "formulation of a subject of inquiry and propositions to be tested," "actual testing of those propositions," critically analyzing the data to assess the validity of those propositions, and communicating a report to the scientific community).

<sup>187.</sup> Id. at 990-92.

time by the relevant scientific community. <sup>188</sup> In other words, purported knowledge may have no scientific basis, some scientific basis, or a strong scientific foundation depending upon its vetting and support within such communities. <sup>189</sup> In sum, science is a communal and evolving enterprise, and scientific knowledge is defined by reference to the degree of that community's acceptance of certain facts or theories at a given point in time. <sup>190</sup>

Evolutionary theory, then, at least in the form of its modern synthesis involving Darwin's theory of natural selection as it has been supplemented by advances and discoveries in the genetic sciences and modern paleontology, represents the scientific community's current and best explanation of the origins of species (including humans) and development of life over time—at least "best" in terms of being derived from empirical observation and analysis of evidence from the natural world, and enjoying the strongest scientific consensus at this time as the explanation of those phenomena that best fits the data. <sup>191</sup> It is important in the context of the current discussion, however, to identify what claims about evolution science does and does not make.

As noted earlier, science (at least as to the natural sciences relevant here) is committed to what is referred to as "methodological naturalism"—a fundamental assumption that observable or perceivable phenomena are explainable solely by natural laws and causes; reference to supernatural causation or direction is beyond the scope of this enterprise. Such an assumption, it is commonly argued, is necessary in order for science to be

<sup>188.</sup> See id. at 990 ("[T]he more new findings are disseminated and independently verified by the scientific community[,] the more valid and reliable such knowledge is considered to be.").

<sup>189.</sup> See id. (suggesting that support of the scientific community determines, at least in part, the validity of the scientific basis of the knowledge).

<sup>190.</sup> See id. ("[A]n individual researcher's findings do not become scientific knowledge until they are collectively judged, sorted and selectively incorporated into the consensual but ever evolving scientific worldview.") (quotations omitted).

<sup>191.</sup> See infra note 207 and accompanying text (emphasizing the overwhelming acceptance of evolution as the dominant scientific theory).

<sup>192.</sup> See Kitzmiller, 400 F. Supp. 2d at 735. As the court in Kitzmiller stated:

Methodological naturalism is a 'ground rule' of science today which requires scientists to seek explanations in the world around us based upon what we can observe, test, replicate, and verify. In science, explanations are restricted to those that can be inferred from the confirmable data—the results obtained through observations and experiments that can be substantiated by other scientists. Anything that can be observed or measured is amenable to scientific investigation. Explanations that cannot be based upon empirical evidence are not part of science.

Id.; see also Greenawalt, supra note 25, at 97–98 (explaining that a methodological naturalist "approach[es] scientific problems on the assumption that physical events have natural causes and can be explained according to uniform laws that need not refer to anything supernatural").

effective; scientific inquiry must search more deeply for naturalistic causes instead of "stopping short" based on claims about supernatural causation that cannot be verified empirically and might ultimately be false. <sup>193</sup> Of course, the obvious potential cost associated with this asserted benefit is that science will miss, or wrongly deny, supernatural causation in cases where it may exist (and, conversely, make incorrect claims about the operation of the natural world in such cases). <sup>194</sup> Nevertheless, methodological naturalism has become an established tenet of science and the scientific method. <sup>195</sup>

Thus, in approaching the question of the creation and development of life on Earth, science is purposefully seeking wholly naturalistic explanations. <sup>196</sup> This alone is a vital limiting principle on the search for truth in this area; science is intentionally biased towards finding naturalistic explanations. <sup>197</sup> This may all be well and good, but it counsels that scientists working in this area—particularly given the difficulties inherent in studying a theory such as evolution that purportedly operates over vast temporal and spatial dimensions and cannot be readily tested and verified in the lab—be especially careful that its claims to *truth* about natural causation are amply supported by the relevant scientific communities. It also counsels that those being taught evolutionary science, and particularly impressionable youths in the science classroom, be fully informed of this inherent bias of scientific inquiry. Moreover, it counsels that truth claims in this area be carefully delineated (and marked off from mere scientific conjecture), and that particular attention be paid to their manner of presentation

<sup>193.</sup> See Kitzmiller, 400 F. Supp. 2d at 736. As the court in Kitzmiller stated:

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

Id. (citations omitted); GREENAWALT, supra note 25, at 97 ("Methodological naturalism has proven very productive; scientists have discovered natural explanations for countless phenomena not previously explicable according to scientific principles.").

<sup>194.</sup> Cf., e.g., MARK ISAAK, THE COUNTER-CREATIONISM HANDBOOK 26 (2007) ("If we do miss a supernatural explanation, so what? Supernatural explanations cannot be generalized, so the explanation does not matter anywhere else. The usefulness of science comes from the ability to apply findings to different areas. Any supernatural explanation would be useless.").

<sup>195.</sup> Supra notes 192–93 and accompanying text; see also Davis & Collins, supra note 60, at 206 ("[S]cientific naturalism, particularly in its methodological and mechanistic varieties, dominates in the academy . . . . ").

<sup>196.</sup> Supra notes 192-93 and accompanying text.

<sup>197.</sup> Id.

in order to avoid thwarting the implementation of such measures through inadvertent contextual obfuscation or misrepresentation.

In any event, it seems clear that the most important limitation on scientific inquiry and knowledge in the area of evolution and human origins is that, even if the empirical evidence regarding a claim pointed to supernatural causation (or if a theory of such causation best explained certain data), it would simply be beyond the scope and competence of science to recognize or acknowledge that fact. 198 In other words, under its own ground rules science excludes religious views from classrooms where it is taught. 199 But this is not the only limitation science operates under as it pertains to the subject of evolution. Even when it claims that the evolutionary process, or parts thereof, can be explained by certain laws or mechanics of nature, science normally does not go further to ask the deeper question of why those laws or mechanics exist or operate as they do in the first place—it mainly takes nature as it is and seeks to understand and explain its operation.<sup>200</sup> Thus it is technically irrelevant to science whether a supreme being created such a world, or whether it arose merely from the interaction of impersonal forces and organized itself into certain patterns and other cause-effect relationships. 201

Moreover, as discussed above, science can only claim valid knowledge about a fact or theory when the latter is sufficiently supported by empirical evidence and a consensus of the relevant scientific community. While the mechanics of natural selection and the origin of different species as explained by the neo-Darwinian synthesis appear to meet this standard today, the question of how life itself began in the first place, for instance, plainly does not. Thus, it would be illegitimate for science to make claims about the latter question without appropriate qualifications and disclaimers regarding their

<sup>198.</sup> *Cf.* ISAAK, *supra* note 194, at 26 ("We cannot observe the supernatural, so the only way we could reach the supernatural explanation would be to eliminate all natural explanations. But we can never know that we have eliminated all possibilities. Even if a supernatural explanation is correct, we can never reach it.").

<sup>199.</sup> Id.

<sup>200.</sup> See Greenawalt, supra note 25, at 113 ("Science cannot explain why anything at all exists, why our lives have meaning, if they do, and why we should be ethical.").

<sup>201.</sup> Id.

<sup>202.</sup> See supra notes 180–90 and accompanying text (examining the scientific enterprise).

<sup>203.</sup> See, e.g., ANDREW H. KNOLL, LIFE ON A YOUNG PLANET: THE FIRST THREE BILLION YEARS OF EVOLUTION ON EARTH 72 (2003) ("In general terms, we understand how biological molecules might have evolved from simpler precursors present on the early Earth. But how proteins, nucleic acids, and membranes came to interact so intricately remains a mystery.").

speculative nature. The same can be said about the question of the origin of our universe itself.<sup>204</sup>

Lastly, if science rules out considering or making claims about the existence of supernatural causation to explain the world, any assertions science were to make about the *nonexistence* of such causation—at least as to questions of ultimate causation regarding why the physical world operates in the way science describes—would similarly be beyond its competence and scope despite the attempts of many scientifically-trained commentators, such as Richard Dawkins, to use science in support of their materialistic worldviews. <sup>205</sup> Thus, efforts of many today to turn science's methodological naturalism into an ontological naturalism seem clearly misplaced. To assert that new discoveries about the mechanisms of natural processes prove that supernatural causation or direction does not exist, suffers from two main flaws. First, as suggested, it ignores the ultimate "why" question with respect to natural mechanisms or processes that have been uncovered and understood—why exactly do such natural laws, order, or phenomena exist in the universe in the first place? This seems at least as reasonably explainable by reference to an intelligent creator and organizer as it is by reference to undirected and unknown material forces. Second, of course, is that such an assertion assumes fallaciously that a "part proves the whole"—because a certain physical phenomenon can be understood and explained by reference to natural process or mechanism, this implies that everything in the universe can. Most supernatural accounts of existence, however, do not invoke supernatural action related to every natural process or occurrence. Most posit such action at critical points in time, such as at the creation of the universe itself, the creation of organic life on Earth, or the origin of the human or other species, and then assume that natural processes and

<sup>204.</sup> See infra note 284 and accompanying text.

Obviously science can disprove claims of direct supernatural causation that might be made as to certain physical events, such as when it discovers and explains how an allegedly miraculous act occurred. And it can also support arguments that can be made against the existence of a supernatural creator, such as when it demonstrates that certain human body parts, for example, are not optimally designed for life on earth (if the claim is that an intelligent creator would make everything perfectly). But what it cannot do is prove that a supernatural creator is not ultimately responsible for our natural world, which is why many commentators like Dawkins resort to arguments about what science has to say about the probability that such a creator exists. However, at this point such claims become philosophic (or even religious) rather than scientific, no matter how much effort is put into clothing them in the garb of the latter discipline. See infra notes 283-90 and accompanying text; cf. Karl Giberson, What's Wrong with Science as Religion?, SALON.COM, July 31, 2008, http://www.salon.com/opinion/feature/ 2008/07/31/religion science/index.html (responding to criticisms of scientific materialists and observing that "the suggestion that nothing can naturally fluctuate into everything sounds a lot like a faith statement on a par with belief in God.") (on file with the Washington and Lee Law Review).

mechanisms take their course in accordance with direction embedded in such actions (including accounts that allow for random events and development to occur within pre-ordained parameters).<sup>206</sup>

In any event, at least as to issues of ultimate causation (or lack thereof), it seems incoherent at best to use science in attempts to disprove the existence of a supernatural supreme being when science itself rejects any acknowledgement of supernatural action even in cases where empirical evidence might point in such a direction. Just as troubling as this, however, is when science is presented in a way to suggest an implicit rejection of religious accounts of phenomena in cases where there is no prevailing scientific knowledge or consensus about explanatory factors. As noted earlier, this may occur when there is no explicit rejection of supernatural accounts, but they are effectively rejected by omission when textbooks or teachings suggest or speculate solely on natural causes for a given event. For example, suppose that a biology textbook is introducing the subject of the origin of life on Earth, and it explains that life may have or probably started with simple self-replicating molecules that resulted from some form of chemical evolution which eventually evolved into more complex organisms and plant life. Even if this explanation of events were to be appropriately disclaimed as consisting of scientific speculation rather than knowledge at this point in time, the impression it leaves on young students is that organic life most likely arose through impersonal natural forces rather than divine action. In other words, a materialist account of the origin of life on Earth is essentially taught by default. As suggested earlier, in order to avoid such a "metaphysical worldview trumping" on such a vital question, it is essential that science textbooks and teachers be very clear about the speculative nature of such claims and the intentional search for naturalistic explanations that drives the scientific enterprise.

Despite all of these caveats about teaching the subject of evolution and human origins in the science classroom, however, it clearly seems appropriate to focus on conveying to students the modern neo-Darwinian account of natural selection given its strong and broad support in the relevant scientific communities as the best prevailing explanation of current empirical evidence regarding the development (not origin) of life on Earth and the origin of human and other species.<sup>207</sup> The real question for present purposes is whether

<sup>206.</sup> Cf., e.g., COLLINS, supra note 20, at 199–201 (describing his belief that after supernatural action created the universe and "[o]nce evolution got under way, no special supernatural intervention was required.").

<sup>207.</sup> See, e.g., Kitzmiller v. Dover Area Sch. Dist., 400 F. Supp. 2d 707, 743 (M.D. Pa. 2005) (discussing "unrebutted testimony that evolution, including common descent and natural selection, is overwhelmingly accepted by the scientific community and that every major

alternative creationist or intelligent design accounts of these phenomena, or creationist or intelligent design critiques of the neo-Darwinian synthesis, can also legitimately claim a place in the science classroom.

Certainly the creationist origins account first pushed in public schools. which essentially incorporated a literal reading of Genesis, cannot be said to represent a scientific theory or consist of scientific knowledge. 208 That account essentially posits God's creation of our universe and world out of nothing within a six-day period at some point during the last ten thousand years, and God's later initiation of a catastrophic flood by which virtually all life on Earth was destroyed and reestablished with chosen survivors from the human and other animal species.<sup>209</sup> Regardless of whether such an account is true or not, causation by God cannot by definition constitute a scientific theory because it posits supernatural causation to explain key events. 210 Such causation is an ultimate origins explanation that is simply outside the scope of scientific investigation, and hence science has nothing to say in support of it or against it. 211 What science can investigate are the key facts asserted to underlie such an account—the relatively young age of the Earth, a catastrophic flood, the descent of the human race from Noahic ancestors, and the descent of animals from certain pairs that survived the flood. But even if such facts were supported by empirical evidence, the most science could say was that such events appear to have occurred and that it took no stance on their ultimate causation (assuming no naturalistic explanations for those events had been discovered).

However, the strong consensus of the scientific community based on its assessment of relevant data is that our world and universe are much older than ten thousand years, that life on Earth took much longer than six days to develop and become established, and that the available evidence does not support the occurrence of a world-wide catastrophic flood which "reset" life on this

scientific association agrees") (quotations omitted). The court further asserted, "'[E]volution is more than a *theory* of origin in the context of science. To the contrary, evolution is the dominant *scientific* theory of origin accepted by a majority of scientists." *Id.* (quoting Selman v. Cobb County Sch. Dist., 390 F. Supp. 2d 1286, 1309 (N.D. Ga. 2005), *vacated*, 449 F.3d 1320 (11th Cir. 2006)).

<sup>208.</sup> See, e.g., McLean v. Ark. Bd. of Educ., 529 F. Supp. 1255, 1266–72 (E.D. Ark. 1982) (concluding that creation science, tied to a literal reading of Genesis, has no scientific merit); see also Greenawalt, supra note 25, at 107 ("Creation science in its full-blown, literal-Genesis form lacks scientific support.").

<sup>209.</sup> See McLean, 529 F. Supp. at 1260 n.7 (quoting the Creation Research Society, a literal fundamentalist organization, membership statement of belief).

<sup>210.</sup> See, e.g., id. at 1267 (stating that the creationist theory of origins, as "a concept[,] is not science because it depends upon a supernatural intervention which is not guided by natural law").

<sup>211.</sup> Id.

planet.<sup>212</sup> Indeed, it is difficult to assert that such claims enjoy even a relatively weak amount of consensus as mere speculation of parts of the science community, even when they may not contradict directly the available evidence supporting evolutionary theory. Thus, one must conclude, as have most courts, that the presentation of such an account in a science course, even if God were left out of the picture, would be an inappropriate attempt to introduce religious beliefs in that setting.<sup>213</sup>

Obviously this conclusion would be different if sufficient empirical evidence existed to support the presentation of the creationist account as a scientifically plausible, alternative explanation of the origin and development of life on Earth. This is precisely what past and current proponents of "creation science" claim is the case. In 1982, however, a federal district court, in *McLean v. Arkansas*, carefully examined such contentions and rejected them. It explained that virtually all of the alleged scientific evidence put forth by creation science proponents actually consisted of claims *criticizing* evolutionary theory rather than *supporting* creationist theory. The court correctly pointed out that such a "scientific" case for the latter theory contained a major fallacy: It implicitly assumed a false, bifurcated model of a non-created, evolved universe, on the one hand, or a universe created by God in the Genesis manner on the other. In other words, the assumption was that evidence purportedly

<sup>212.</sup> See, e.g., ISAAK, supra note 194, at 217, 231–42 (approximating Earth's age at 4.5 billion years and countering various creationist justifications and arguments that defend the flood).

<sup>213.</sup> Unless, of course, the scope of a science class was defined broadly enough to allow discussion of religious ideas touching on covered topics, as has been proposed in England. See, e.g., Tony Halpin, Creationism to Be Taught on GCSE Syllabus, TIMES (London), Mar. 10, 2006, at 12 (reporting on the incorporation of creationism to the syllabus by an examinations board "to make students aware of scientific controversy"). But such attempts have been opposed in the United States because of a history of trying to present such ideas as alternative scientific truth. See, e.g., supra notes 99–106, 133–46 and accompanying text (describing some of the most notable judicial decisions concerning the presentation of religious ideas as science in public schools).

<sup>214.</sup> Assuming, again, that ultimate supernatural causation was left out of that account.

<sup>215.</sup> See McLean v. Ark. Bd. of Educ., 529 F. Supp. 1255, 1272 (E.D. Ark. 1982) (invalidating creation science law as having the purpose and effect of advancing religion and explicitly determining that creation science was not legitimate science).

<sup>216.</sup> *Id.* at 1270 ("The proof in support of creation science consisted almost entirely of efforts to discredit the theory of evolution through a rehash of data and theories which have been before the scientific community for decades."). The court added, "The arguments asserted by creationists are not based upon new scientific evidence or laboratory data which has been ignored by the scientific community." *Id.* 

<sup>217.</sup> See id. at 1266 ("The two model approach of the creationists is simply a contrived dualism which has no scientific factual basis or legitimate educational purpose.").

undermining evolutionary theory would necessarily support the Genesis account.<sup>218</sup> This is plainly incorrect, given the myriad number of other possible origins scenarios *not* discounted by *legitimate* scientifically-supported critiques of standard evolutionary theory—not the least of which would include a noncreated, evolutionary model not captured accurately by existing theory, a universe created by God through evolutionary processes not captured accurately by existing theory, or a universe created by God through processes other than evolution but different than those described in Genesis.

This logical fallacy in the creationist scientists' "proof" of their origins account fatally undermined its validity, notwithstanding the problem of whether such critiques of evolutionary theory truly undermined it to such an extent that it would prove an alternative origins account to be true, even if one assumed, arguendo, that only two different versions were possible. But the two main types of evidence put forth by that group did not even satisfy the latter proposition. As to the first type, it was argued, and the court actually found, that the creation scientists "established that the mathematical probability of a chance chemical combination resulting in life from non-life is so remote that such an occurrence is almost beyond imagination."<sup>219</sup> While finding such "statistical figures . . . [to] be impressive evidence against the theory of chance chemical combinations as an explanation of origins,"220 the court pointed to the "dual-model" fallacy in using such evidence as proof of the Genesis account of creation.<sup>221</sup> Moreover, as the court failed to note but had pointed out earlier in its opinion, while "the subject of origins of life is within the province of biology, the scientific community does not consider origins of life a part of evolutionary theory. The theory of evolution "assumes the existence of life"

<sup>218.</sup> See id. ("Application of these two models, according to creationists... dictates that all scientific evidence which fails to support the theory of evolution is necessarily scientific evidence in support of creationism and is, therefore, creation science 'evidence' in support of [the statute]....").

<sup>219.</sup> Id. at 1269.

<sup>220.</sup> Id.

<sup>221.</sup> See id. at 1269–70 (highlighting the testimony of the defense's expert witness, Dr. Wickramasinghe, in order to show the fallacy of thinking that evidence criticizing evolution was proof of creation). Dr. Wickramasinghe testified on his "theory that life on earth was 'seeded' by comets which delivered genetic material[s] and perhaps [living] organisms" to Earth from somewhere else in space. Id. at 1269. This theory certainly did not dispose of the question of life's origin in the universe; it merely attempted to explain life's presence on Earth. Id. However, it did serve as an illustration of how the "dual model" fallacy failed to account for other possibilities besides evolution and creationism. See id. at 1269–70 ("[Dr. Wickramasinghe] demonstrated that the simplistic approach of the two model analysis of the origins of life is false.").

and is directed to an explanation of how life evolved."<sup>222</sup> In other words, the initial appearance of life on Earth is not within the claims of evolutionary theory much less the subject of any other established scientific theory—the former assumes the existence of life and proceeds to explain how it evolved and developed into new species after the appearance of the first living organisms.<sup>223</sup> In short, standard evolutionary theory is agnostic on the question of whether the complex biochemical processes we call "life" were the product of a divine spark or undirected material forces.<sup>224</sup> Accordingly, probabilistic evidence as to the initial appearance of life—even putting aside its "logical" (mathematical) versus "empirical" nature—was simply not a valid critique of evolutionary theory even if it was persuasive evidence against the notion of life appearing by chance in the first place.

The second type of evidence presented by the creation scientists concerned the age of the Earth. They presented a recent discovery of "radioactive polonium haloes in granite and coalified woods" that were thought to be inconsistent with techniques used by scientists to date the creation of fossils and other materials at millions of years in the past. Thus, it was argued, such evidence supported the 6,000–10,000 year age of the Earth derived from Genesis rather than the much older time span assumed by evolutionary theory. On its merits, the court found this critique of scientific dating techniques to be weak, concluding that the scientific community viewed such a discovery "as a minor mystery which will eventually be explained." Indeed, several plausible scientific explanations have since been offered to resolve the apparent inconsistencies between the haloes phenomenon and the ancient age of the materials in which they appear. Once again, however, even a valid critique of such dating techniques would obviously not serve to validate an estimated age of the Earth derived from Genesis. Not only would alternative

<sup>222.</sup> Id. at 1266.

<sup>223.</sup> Id.

<sup>224.</sup> See id. ("Evolution does not presuppose the absence of a creator or God . . . . ").

<sup>225.</sup> See id. at 1270 (dismissing creationists' alleged proof of "a 'relatively recent inception' of the earth and a 'worldwide flood'").

<sup>226.</sup> Id.

<sup>227.</sup> The court also took note of other evidence questioning the validity of radioactive dating techniques used by scientists to estimate ages of fossils and other materials. *Id.* at 1272.

<sup>228.</sup> Id.

<sup>229.</sup> See, e.g., Thomas A. Baillieul, Polonium Haloes Refuted: A Review of "Radioactive Haloes in a Radio-Chronological and Cosmological Perspective" by Robert V. Gentry, TALK ORIGINS, http://www.talkorigins.org/faqs/po-halos/gentry.html (last visited Nov. 1, 2008) (criticizing the scientific method of Gentry's experiment and characterizing his results as inconclusive at best) (on file with the Washington & Lee Law Review).

scientific dating techniques establishing a very ancient age of the Earth also need to be persuasively undermined, but affirmative and convincing evidence of a "young Earth" would also need to be presented—something the creation scientists failed to do. And although such an examination of creation scientist claims was undertaken by the *McLean* court over two decades ago, it does not appear the empirical evidence put forth by that group to critique neo-Darwinian theory or support the Genesis account of creation has become any stronger in the intervening period. <sup>231</sup>

Turning now to the legitimacy of intelligent design as science, that theory asserts that certain features of the universe and life are best explained as the product of conscious design rather than undirected or random processes such as natural selection. As noted earlier, two main arguments have typically been made to support this claim: Behe's argument about "irreducible complexity" and Dembski's argument based on the notion of "complex specified information." ID proponents claim that both of these concepts amount to scientific theories because they are based on conclusions drawn from the observation and critical analysis of empirically-derived information.

Considering Behe's work first, his data gathering and analysis essentially consists of observations and judgments that certain features of an organism, like a bacteria's flagellum used for locomotion or a human body's blood-clotting system, appear to exhibit irreducible complexity in their system components.<sup>235</sup> Indeed, ID proponents suggest that irreducible complexity can be empirically

<sup>230.</sup> See McLean v. Ark. Bd. of Educ., 529 F. Supp 1255, 1270 (E.D. Ark. 1982) (highlighting that even defense expert witnesses expressed a view, contrary to the "haloes" theory, that "no rational scientist" would believe that the earth was less than one million years old or that its current geology could have been created by a worldwide flood).

<sup>231.</sup> See ISAAK, supra note 194, at 216-45 (summarizing creationist arguments for a "young Earth" and presenting some of the scientific evidence contradicting each of these claims); see also TalkOrigins Archive, http://www.talkorigins.org (last visited Nov. 1, 2008) (indexing lists of creationist claims and evolutionary counterevidence) (on file with the Washington & Lee Law Review).

<sup>232.</sup> See supra Part II.C (describing intelligent design theory).

<sup>233.</sup> See supra Part II.C (discussing Behe's theory of "irreducible complexity" in greater detail).

<sup>234.</sup> *Id.* However, in his more recent writings, Dembski appears to have incorporated Behe's notion of irreducible complexity as a subset of his own argument based on specified complexity. *See* DEMBSKI & WELLS, *supra* note 126, at 149 (summarizing what Dembski means by his term "specified complexity"). He finds that the biochemical systems that Behe identifies meet the criteria of being both complex and specified, hence meeting his test for being a product of design. *Id.* 

<sup>235.</sup> See generally BEHE, supra note 117 (presenting examples of irreducibly complex biochemical systems that Behe claims are not adequately explained by the theory of natural selection).

tested and verified: Simply remove one of these systems' components and see whether the systems still perform their original functions. If not, they have been proven to be irreducibly complex and unattainable by means of natural selection since such a system could not have evolved directly as long as there is no apparent lesser degree of original function associated with the more simply composed systems (and hence nothing to select for at that earlier stage of development). And once that has been established, the reasoning goes, intelligent creation and design for such systems become a better explanation for their origin than natural selection. 238

Now whether and to what extent an argument or theory is considered scientific depends, as discussed earlier, on its support in empirical observations, experiments, or measurements that can produce objective, replicable findings, and the extent to which those findings are actually verified by the relevant scientific communities and result in some degree of consensus on the conclusions drawn from them.<sup>239</sup> While it might be said that studying biochemical or other natural systems for signs of irreducible complexity is an empirical process because it involves visual observations and assessments based upon them—and even might be testable to some extent by showing that the loss of a component results in the loss of a system's function (although no empirical demonstration of an irreducibly complex system seems to have successfully been made to date)<sup>240</sup>—it is difficult to say that such a process results in objective findings that would be replicable by others. This is because an assessment of irreducible complexity is not a measurement or other objectively quantifiable data point, but rather a speculative and subjective

<sup>236.</sup> See, e.g., DEMBSKI & WELLS, supra note 126, at 148 (asserting that a determination of "whether a system is irreducibly complex . . . requires an analysis of the system, and specifically of those parts whose removal renders the basic function unrecoverable"). "This analysis needs to demonstrate that no system with (substantially) fewer parts exhibits the basic function . . . . Consequently, these parts belong to the irreducible core, a fact that receives empirical confirmation by removing the parts experimentally and showing that the basic function is unrecoverable from the remaining parts." Id. at 148–49.

<sup>237.</sup> However, Dembski concedes that not *all* parts are necessary, only those that make up a part of what he calls the "irreducible core." *Id.* 

<sup>238.</sup> See id. at 156 (determining that Darwinian mechanisms of natural selection are of no help in explaining how some traits are selected for their future function).

<sup>239.</sup> See supra notes 180-90 and accompanying text (discussing the generally accepted scientific process).

<sup>240.</sup> See Kitzmiller v. Dover Area Sch. Dist., 400 F. Supp. 2d 707, 740–41 (M.D. Pa. 2005) (citing peer reviewed studies that appear to negate evidence of irreducible complexity); see also Miller, supra note 110, at 70–74 (criticizing ID's failure to prove irreducible complexity); BARBARA FORREST & PAUL R. GROSS, CREATIONISM'S TROJAN HORSE: THE WEDGE OF INTELLIGENT DESIGN 66–84 (2004) (discussing lack of scientific support for the concept of irreducible complexity).

judgment that a precursor system could not have functioned at a less optimal level within the earlier and likely different environment that it would have been operating in. In other words, the very most one could establish from such an empirical process is that a precursor system *appeared* to have had no previous useful function. It seems clear that such a "finding" would be more in the nature of an opinion than a replicable event or data point—it would only be replicable to the extent a fellow scientist was to agree with that subjective judgment. 243

And even if scientists were inclined to agree with such an assessment, it would most likely be subject to a critical qualifier—i.e., that based on the state of existing evidence and knowledge, no prior useful function appeared to be known. Hence, most scientists would consider any such assessment to be speculative because evidence of a component's prior useful function could always be discovered at a later point in time. To assert, then, that the theory of irreducible complexity is based on objective data that can be verified and confirmed by other members of the scientific community seems inaccurate.

Moreover, even if a finding of irreducible complexity could be established objectively and was verifiable, it seems unlikely that any sort of scientific consensus would ever emerge that such a condition was the result of conscious design as opposed to natural processes. As other commentators have observed, an inference that an irreducibly complex system *must have* been designed *as is* because the process of natural selection could not have produced it embodies the same false dichotomy embodied in the arguments of creation scientists: Either natural selection produced it or it was the product of intelligent design.<sup>245</sup>

<sup>241.</sup> See Keith Robison, Darwin's Black Box: Irreducible Complexity or Irreproducible Irreducibility?, TALKORIGINS, http://www.talkorigins.org/faqs/behe/review.html (last visited Nov. 8, 2008) ("A system is labeled 'irreducibly complex' if he [Behe] cannot postulate a workable simpler form for the system. There is no way to prove such a claim.") (on file with the Washington & Lee Law Review), see also Massimo Pigliucci, Denying Evolution: Creationism, Scientism, and the Nature of Science 67 (2002) (characterizing irreducible complexity as a negative theory, that only predicts what cannot happen, and therefore cannot be scientifically proven).

<sup>242.</sup> Cf. PIGLIUCCI, supra note 241, at 67 ("Behe has provided no backing for his claim that irreducibly complex biological structures exist, other than to say that he cannot think of how they could be possible through natural selection.").

<sup>243.</sup> This is a judgment that, in any event, most scientists would not be comfortable making given its unsupported and speculative nature. See supra note 240 and accompanying text (discussing lack of empirical demonstrations of irreducible complexity).

<sup>244.</sup> See Kitzmiller, 400 F. Supp. 2d at 739 (observing that such a qualification on the theory renders it meaningless as a criticism of evolutionary theories that have well-documented support for how multi-structured systems could have evolved through natural means).

<sup>245.</sup> See id. at 735 ("[T]he argument of irreducible complexity, central to ID, employs the same flawed and illogical contrived dualism that doomed creation science in the 1980's.").

As discussed earlier, a refutation of natural selection would not prove the latter. There are myriad alternative accounts that could conceivably explain an irreducibly complex system, such as an incomplete understanding of how natural selection works or the existence of an alternative evolutionary process that has yet to be discovered. Indeed, as noted by the court in the *Kitzmiller* case, there appears to be an emerging scientific consensus that natural selection can operate through *indirect* Darwinian pathways such that precursor systems are selected on the basis of performing different functions than they do in a current system, a process referred to as "exaptation." Obviously, such findings present a huge stumbling block for the concept of irreducible complexity which is only an argument against *direct* natural selection pathways. In the latter of the concept of irreducible complexity which is only an argument against *direct* natural selection pathways.

Lastly, although ID proponents do not officially take the position that God is the intelligent designer of irreducibly complex systems—asserting that space aliens could have been the designer<sup>250</sup>—the lack of evidence for the latter

Although an organ may not have been originally formed for some special purpose, if it now serves for this end we are justified in saying that it is specially contrived for it . . . . [T]hroughout nature almost every part of each living being has probably served, in a slightly modified condition, for diverse purposes, and has acted in the living machinery of many ancient and distinct specific forms.

<sup>246.</sup> Supra notes 216-18 and accompanying text.

<sup>247.</sup> Cf. MILLER, supra note 110, at 57–58 (citing the example of discovery of the mechanism by which the human body developed left-right asymmetry to show that it is incorrect to assume, simply because the origin of a scientific mechanism has not been discovered yet, that the mechanism came about by non-natural means).

<sup>248.</sup> See Kitzmiller v. Dover Area Sch. Dist., 400 F. Supp. 2d 707, 739 (M.D. Pa. 2005) (citing exaptation as a "well-documented explanation" which contradicts Behe's hypothesis of irreducible complexity); see also MICHAEL SHERMER, WHY DARWIN MATTERS: THE CASE AGAINST INTELLIGENT DESIGN 68–71 (2006) (explaining exaptation as a phenomenon "in which a feature that originally evolved for one purpose is co-opted for a different purpose"). Shermer uses exaptation to refute Behe's criticisms of such complex designs as the blood clotting system and wing development in animals. Id. He also notes that Behe's irreducible complexity criticism is similar to the problem of incipient stages that Darwin himself identified in the nineteenth century, and that Darwin's answer to this criticism supported the theory now known as exaptation:

Id. (quoting Darwin, On the Various Contrivances by Which British and Foreign Orchids Are Fertilized by Insects, and on the Good Effects of Intercrossing 328 (1862)).

<sup>249.</sup> See Kitzmiller, 400 F. Supp. 2d at 739 (quoting Professor Behe's statement that "[a]n irreducibly complex system cannot be produced *directly* by slight, successive modifications of a precursor system, because any precursor to an irreducibly complex system that is missing a part is by definition nonfunctional") (emphasis added).

<sup>250.</sup> See Behe, supra note 117, at 248–49 (discussing the possibility articulated by Sir Francis Crick, one of the discoverers of the DNA double-helix structure, that life on earth began when intelligent alien life forms sent rocket ships containing spores to seed the earth).

explanation would probably lead most scientists to conclude that an inference of intelligent design was a thinly-veiled assertion of supernatural causation that violates the principle of methodological naturalism.<sup>251</sup> Indeed, this was one of the main reasons why the *Kitzmiller* court concluded that intelligent design, and in particular the concept of irreducible complexity, was not a scientific theory.<sup>252</sup> For all of these reasons, it seems clear that the concept of irreducible complexity does not amount to a scientific theory as the enterprise of science is understood and defined today.<sup>253</sup>

William Dembski's idea of "complex specified information" (CSI) seems equally problematic from the perspective of presenting a valid scientific theory based on empirically objective and testable information. As noted earlier, Dembski's arguments are steeped in information and probability theory, and he purports to prove their validity using complex mathematical and probability formulae. As such, his arguments rely primarily on the logical rather than empirical sciences, and are difficult for a non-mathematician or non-statistician to follow. In reviewing his work and the reviews of qualified critics, however, Dembski appears to ask two basic questions in structuring his argument for intelligent design. First, does a natural object, such as one of Behe's irreducibly complex systems which Dembski uses as an example of an object exhibiting CSI, contain information sequences that are highly

<sup>251.</sup> Cf., e.g., Kitzmiller, 400 F. Supp. 2d at 735–38 (quoting defense witness's expert testimony that ID posits only a supernatural entity could have designed the various forms of life found on earth). Dr. Millich acknowledged that in order to recognize intelligent design as science, the rules of science would have to be expanded to accept the possibility of supernatural forces. Id.

<sup>252.</sup> *Id.*; see *supra* notes 240–49 and accompanying text for the other main reasons that the court found irreducible complexity to be a nonscientific theory.

<sup>253.</sup> For a recent and very comprehensive critique of Behe's theories, including an updated explication of them which Behe recently published in a new book, see MILLER, *supra* note 110, at 28–36, 53–74.

<sup>254.</sup> See supra notes 125-30 and accompanying text (describing the theory of specified complexity).

<sup>255.</sup> See, e.g., Tainer Edis, Chance and Necessity—and Intelligent Design?, in WHY INTELLIGENT DESIGN FAILS: A SCIENTIFIC CRITIQUE OF THE NEW CREATIONISM 139, 139–52 (Matt Young & Taner Edis eds., 2006); Wesley R. Elsberry, Logic and Math Turn to Smoke and Mirrors: William Dembski's "Design Inference," in SCIENTISTS CONFRONT CREATIONISM: INTELLIGENT DESIGN AND BEYOND 250, 250–71 (Andrew J. Petto & Laurie R. Godfrey eds., 2007); Forrest & Gross, supra note 240, at 114–46; Mark Perakh, There Is a Free Lunch After All: William Dembski's Wrong Answers to Irrelevant Questions, in WHY INTELLIGENT DESIGN FAILS: A SCIENTIFIC CRITIQUE OF THE NEW CREATIONISM 153, 153–71; PIGLIUCCI, supra note 241, at 59–64; Jeffrey Shallit & Wesley Elsberry, Playing Games with Probability: Dembski's Complex Specified Information, in WHY INTELLIGENT DESIGN FAILS: A SCIENTIFIC CRITIQUE OF THE NEW CREATIONISM 121, 121–38; NIALL SHANKS, GOD, THE DEVIL, AND DARWIN: A CRITIQUE OF INTELLIGENT DESIGN THEORY 123–34, 171–76 (2004).

improbable (i.e., not easily reproducible by chance)? If so, then the object exhibits complexity. Second, do such sequences contain relatively concise patterns of information such that they are likely to have been produced independently of the natural process that gave rise to the object and its information content? If so, then the object exhibits CSI most likely caused by conscious or intelligent direction rather than resulting from chance or the operation of natural laws or processes. At its essence, Dembski's concept of CSI appears to be a statistically sophisticated argument that complex designs of natural objects, such as Behe's irreducibly complex systems, are highly unlikely to be the result of random events or undirected but regular natural processes—that is, they are highly improbable events absent recourse to an explanation of intelligent design.

While Dembski's arguments are far too technical to be evaluated fairly by someone not educated in mathematics, information theory or related disciplines, the numerous critiques of his work by those qualified to make such judgments seem to voice two main complaints about their scientific validity. The first is that Dembski's arguments are too abstract and theoretical in nature, relying heavily on subjective judgments that are skewed towards finding intelligent action in the universe. More specifically, the criticism appears to go, judgments about the complexity of information sequences, or the nature and source of information patterns, are so wide open that one can engineer them to support almost any desired conclusion. The implication here is that Dembski's analysis, like Behe's irreducible complexity arguments, fails to contain the sort of objective and verifiable information that scientific theories are made of.

The second major complaint has to do with Dembski's premise that any design purportedly found in nature must come from an intelligent actor. <sup>261</sup>

<sup>256.</sup> DEMBSKI & WELLS, *supra* note 126, at 165 ("An object, event, or structure exhibits specified complexity if it is both complex (i.e., not easily reproducible by chance) and specified (i.e., displays an independently given pattern)."); *id.* at 168 ("The 'complexity' in 'specified complexity' refers to improbability.").

<sup>257.</sup> See supra note 256; id. at 169, 172–75 (setting out the requirements that in order to exhibit specified complexity, a system must have low descriptive complexity—have a pattern or structure that is relatively simple to describe—but have a small probability of occurring by chance).

<sup>258.</sup> See id. at 160 ("It's not just that certain biological systems are so complex that we can't imagine how they evolved by Darwinian pathways. Rather, we can show conclusively that direct Darwinian pathways are causally inadequate to bring them about . . . .").

<sup>259.</sup> See, e.g., Shallit & Elsberry, supra note 255, at 121, 130–32 (criticizing Dembski's "pseudomathematical" arguments as being calculated to reach the desired results).

<sup>260.</sup> Id.

<sup>261.</sup> See, e.g., FORREST & GROSS, supra note 240, at 121 (criticizing Dembski's premise

Dembski appears to split the world into three main categories: Things that occur or arise 1) by necessity through the operation of "regular" natural laws or processes, 2) by chance or at random via the operation of undirected natural processes, or 3) by the actions of an intelligent designer. Thus, if one can rule out the first two options as the cause of something (as Dembski frequently claims to do through his calculations), then one has proven the third to be true through the process of elimination. But, the critics contend, there is also a fourth category that Dembski ignores and that is devastating for his theory: Self-organizing things exhibiting patterns or design that are produced through non-regular natural processes, such as certain meteorological phenomena or even natural selection itself. Thus, what appears to be design in nature can in fact be produced by non-intelligent forces. This fact, it is contended, invalidates Dembski's entire "process of elimination" logic. 165

Although Dembski does have a few supporters in the ranks of those qualified to assess his work, it seems clear that he has far more detractors in that group. <sup>266</sup> Accordingly, even if it could be said that Dembski's arguments were based on objective and empirically testable data—which does not appear to be the case—his theory certainly does not have the sort of verification and scientific consensus that would qualify it for presentation in a science classroom as a valid scientific theory. <sup>267</sup>

<sup>&</sup>quot;that supernatural agency is the only acceptable answer to the question of the source of the world's creation and order").

<sup>262.</sup> See id. at 122–25 (summarizing Dembski's categorization of natural phenomenon); PIGLIUCCI, supra note 241, at 59 (asserting that Dembski "claims that there are three essential types of phenomena in nature: 'regular,' random, and designed (the last of which he assumes without further discussion to be products of intelligence).").

<sup>263.</sup> See FORREST & GROSS, supra note 240, at 124 (observing that Dembski's "explanatory filter is an algorithmic method of logical inference, by which it is claimed we can reliably discover design, anywhere in the physical world, without false positives, by a process of elimination").

<sup>264.</sup> See PIGLIUCCI, supra note 241, at 59-64 (discussing organization or design in natural phenomena resulting from non-intelligent processes); Miller, supra note 110, at 74-85 (same); cf. Mark Perakh, The Dream World of William Dembski's Creationism, TALK REASON, Aug. 19, 2005, http://www.talkreason.org/articles/Skeptic\_paper.cfm (last visited Nov. 2, 2008) (discussing the rare occurrence of triangular snowflakes as a natural phenomenon that occurs under very rare circumstances) (on file with the Washington and Lee Law Review). These rare triangular snowflakes have a simpler design than normal snowflakes and could arguably cause false positive results when analyzed according to Dembski's mathematical formula for determining whether a phenomenon is the product of intelligent design. Id.

<sup>265.</sup> See Pigliucci, supra note 241, at 59-64.

<sup>266.</sup> See supra note 255 (cataloging several of Dembski's strongest critics).

<sup>267.</sup> For a recent and comprehensive critique of Dembski's theories from a prominent biologist's perspective, see MILLER, supra note 110, at 36–40, 74–85.

This brings us to the current strategy of ID proponents, who tellingly are not pushing at the present time for their claims to be taught directly as a theory of biological origins. Rather, as noted earlier, they currently advocate a strategy of "teaching the controversy" in science classrooms: Essentially urging science teachers to present Behe's, Dembski's, and certain other arguments as critiques of, and alternatives to, the neo-Darwinian account, and mainly the theory of natural selection. However, just as a theory being taught as science in a science class must enjoy a substantial degree of scientific consensus to qualify for such treatment, it follows that a purported scientific controversy about such a theory should also be supported by some degree of scientific consensus on the criticism before it is also entitled to be taught as part of the relevant science. Just what that level of critical consensus should be is difficult to say, huit it seems fair to say that it must, at the least, be significant and meaningful. And to create such a consensus, just as with the original theory, there would need to be empirically objective and verifiable data supporting the criticism.

Keeping these considerations in mind, it seems clear that ID proponents have not met their burden of showing that there is a genuine scientific controversy about prevailing evolutionary theory that would warrant the presentation of ID theories or critiques in the science classroom. As discussed above, the extent to which Behe's and Dembski's theories are based on objective and testable empirical data is highly questionable, and even if they

For instance, in June of 2006, just six months after the Kitzmiller decision, the Discovery Institute produced a video entitled, How to Teach the Controversy Legally (Discovery Institute 2006), available at http://www.discovery.org/a/2111 (last visited Nov. 2, 2008) (on file with the Washington & Lee Law Review). The Discovery Institute website touts the video as "[a] great resource for teachers, school board members, and parents, this video features interviews with scientists and legal scholars and explains how to teach the controversy over evolution in a legally responsible manner." Center for Science and Culture, How to Teach the Controversy Legally, http://www.discovery.org/a/2111 (last visited Nov. 2, 2008) (on file with the Washington & Lee Law Review). See also Discovery Institute Guide for Teachers, at 8, http://www.discovery.org/a/4299 (containing criticisms of evolutionary theory made by ID proponents in addition to those based on Behe's and Dembski's arguments); id. at 13 (asserting that "[a]lthough Discovery Institute does not advocate requiring the teaching of intelligent design in public schools, it does believe there is nothing unconstitutional about voluntarily discussing the scientific theory of design in the classroom. In addition, the Institute opposes efforts to persecute individual teachers who may wish to discuss the scientific debate over design in an objective and pedagogically appropriate manner.").

<sup>269.</sup> See generally CTR. FOR SCI., MATHEMATICS, & ENG'G EDUC., NATIONAL SCIENCE EDUCATION STANDARDS (National Academic Press 1996), available at http://www.nap.edu/openbook.php?record\_id=4962&page=103 (last visited Nov. 1, 2008) (discussing content of national science education standards) (on file with the Washington & Lee Law Review).

<sup>270.</sup> Cf. McDonald, supra note 180, at 987-88 (describing the methods used to establish "scientific" knowledge).

were, there is hardly a scientific consensus—much less a significant and meaningful one—that they constitute valid scientific theories.<sup>271</sup> And this is true regardless of whether those theories are presented as criticisms of evolutionary theory and natural selection, or are presented as affirmative evidence of intelligent design in the universe.<sup>272</sup> Moreover, even if their

<sup>271.</sup> See, e.g., Kitzmiller v. Dover Area Sch. Dist., 400 F. Supp. 2d 707, 745 (M.D. Pa. 2005) (refusing to accept ID as a valid scientific theory because of its failure to follow the science community's recognized processes of establishing consensus to support a new theory). See also generally Matthew J. Brauer, et al., Is it Science Yet?: Intelligent Design Creationism and the Constitution, 83 Wash. U. L.Q. 1 (2005) (arguing that ID is not science and persuasively critiquing arguments of ID proponents that it is and could constitutionally be taught as such in the public schools). Cf. Wexler, supra note 24, at 799–834 (arguing that courts would consider ID to be a religious theory that could legally be taught objectively for informational purposes, but questioning the wisdom of such an approach particularly as to including such a subject in the science curriculum).

Kent Greenawalt makes a cogent and powerful argument that intelligent design theories are best understood as being theories about the limits of science in this area, and particularly about the current inadequacy of the theory of natural selection to fully explain biological systems that appear rather complex and ordered. See GREENAWALT, supra note 25, at 108-15. As such, he suggests that intelligent design might properly and legally be discussed in science classes as one conceivable alternative explanation for such complexity and order where evidence regarding natural selection is insufficient to support it. See id. at 108-25. He explains that where "scientific evidence may suggest that no natural explanation suffices for physical events . . . [and] convincing evidence of such [explanatory] limits lay within science itself, their analysis would appropriately fall within the scope of science courses." Id. at 113. In other words, Greenawalt appears to be arguing that where evidence is strong that natural selection cannot sufficiently explain the apparent irreducible complexity of some organisms, then a discussion of the latter concept and possible explanations for it (i.e., intelligent design) is fair game as a scientific topic. Putting aside the fact that many scientists would likely dispute the notion that current evidence for natural selection cannot adequately explain apparent irreducible complexity, and assuming there was a scientific consensus for this position, in offering intelligent design as one possible explanation for it Greenawalt seems to be taking basic issue with science's "ground rule" of methodological naturalism (limiting scientific explanations to naturalistic ones). Indeed, he seems to concede this point. See id. at 113-14. In a recent and intriguing article, philosopher Thomas Nagel (a professed atheist) appears to make similar arguments, see generally Thomas Nagel, Public Education and Intelligent Design, 36 PHIL. & PUB. AFF. 187 (2008), and particularly takes issue with the principle of methodological naturalism to the point of being dismissive about its legitimacy. See id. at 196 n.7. Greenawalt and Nagel may be absolutely right to question the soundness of a rule that treats supernatural explanations as being inherently out of bounds even where empirical evidence points strongly to the implausibility of natural explanations. At bottom, however, these appear to be arguments that the current definition and accepted understanding of science does not make sense and should change, despite the instrumentalist rationale that is put forth to defend methodological naturalism. And one way of addressing this may be to convince state education boards that they are right, thus pitting those bodies against the general scientific community and creating even more controversy in this area. Another approach may be to follow the route I suggest in this Article, allowing that community to set the ground rules of its discipline, but exposing students learning about it to potential supernatural explanations of "difficult to explain" natural phenomena as matters of traditional philosophical analysis in a class designed for such

theories could be regarded as legitimately scientific, it is far from clear that they even create a controversy regarding prevailing evolutionary theory. As noted earlier, science has shown that design in nature can result from natural forces (creating a problem for Dembski's theory),<sup>273</sup> and is showing that natural selection can proceed via indirect pathways of evolution (creating a problem for Behe's theory).<sup>274</sup>

In sum, it appears that much more would be required of creationist and ID theories of origins before they could appropriately be taught in the biology classroom. 275 But does this mean that the concepts of creation and purposeful design, and supporting arguments that may be drawn from the creationist and ID camps, among other sources, have no place in American public education? It should be clear from what I have said that legitimate science does not officially take a position on the "nature of origins" issue, one way or another. It is simply trying to explain the way our world works as we see it, and not the question of why it ultimately works in the way it does. However, in an area like evolutionary biology, where biology class is typically the only course middle or high school students will take that deals with the subject of life or human origins, such a sterile scientific account is inadequate to prepare American youths to answer such important questions for themselves. Either they will not grasp the subtleties of the limited nature of the scientific endeavor, or, whether they do or not, they will come away from their public education with the impression that religion has little to say on these issues. Hence, it seems likely that, in the main, one of two things will result: Either students will take away a materialistic account of origins by default, or the more religiously-involved students will reject everything they learned about evolutionary biology as being in conflict with their faith. Either way, science, religion, students, and our society all end up the poorer in this situation.

purposes. See infra Part III.C.

Michelangelo D'Agostino, In the Matter of Berkeley v. Berkeley, BERKELEY SCI. REV. 31, 33 (Spring 2006).

<sup>273.</sup> See supra note 264 and accompanying text.

<sup>274.</sup> See supra note 248 and accompanying text (describing theory of exaptation).

<sup>275.</sup> Perhaps the strongest indictment of ID as science comes from the recognized founder of the modern ID movement, Philip Johnson, who made these candid and surprising remarks in a recent interview:

<sup>&</sup>quot;I... don't think that there is really a theory of intelligent design at the present time to propose as a comparable alternative to the Darwinian theory, which is, whatever error it might contain, a fully worked out scheme. There is no intelligent design theory that's comparable. Working out a positive theory is the job of the scientific people that we have affiliated with the movement. Some of them are quite convinced that it's doable, but that's for them to prove .... No product is ready for competition in the educational world."

What, then, is the answer to this undesirable state of affairs? Is there an appropriate class to further examine the limited scope of the scientific endeavor, and to engage students in a broader discussion of theistic and materialistic perspectives on the origins of ourselves, life, and the universe? It is my argument that a basic philosophy course on the subject, geared to upper-level high school students, is the optimal solution. In the next section, I explain why such a philosophy of origins course would be the ideal venue.

# C. A Basic Philosophy of Origins Course To Bridge the Science-Religion Divide

In contrast to science, which is a discipline that seeks to discover and explain the workings of the natural world via an emphasis on empirical evidence and an objective, rigorous analysis of it, philosophy is a discipline with a broader scope and methods of inquiry. As one dictionary puts it, philosophy investigates "the nature, causes, or principles of reality, knowledge, or values, based on logical reasoning rather than empirical methods."

Thus, not only is philosophy's scope of inquiry broader than science, investigating the nature of "reality" versus the natural world alone, its methods of inquiry are broader as well.

Though both disciplines rely on the use of logical reasoning in conducting their inquiries, science places a much higher degree of importance on empirical evidence as the basis for its claims. While "hard" data derived from human observation and other sensory faculties certainly informs philosophical inquiry, the main grist for its mill tends to be "common human experience" and basic

<sup>276.</sup> The American Heritage Dictionary of the English Language 1318 (4th ed. 2000).

<sup>277.</sup> Cf., e.g., Mortimer J. Adler, The Four Dimensions of Philosophy 810–11 (1993). Adler states:

Philosophy, like science and history, and unlike mathematics, is empirical, not formal, differing in the character of the experience it uses and relies upon. But it is also like mathematics, and unlike science and history, in being an armchair, or noninvestigative mode of inquiry by virtue of the fact that the experience it uses and upon which it relies is the common core of experience that all human beings have when they are awake and are exercising their senses . . . .

Id.

<sup>278.</sup> *Id.* at 53 ("One should not expect in philosophy anything like the progress that has occurred in the history of science, in view of the fact that philosophy is noninvestigative, has its empirical base in common human experience, and is continuous with common sense.").

"common sense."<sup>279</sup> Accordingly, logic and common experience serve as the philosopher's main tools of the trade in investigating various aspects of reality.<sup>280</sup>

It seems clear, then, that philosophy is the intellectual discipline that should be employed to handle the materialism-theism debate in the origins context. The existence or non-existence of a supernatural creator, and "its" relationship to our world, have long been central subjects of inquiry in the philosophical tradition.<sup>281</sup> This is because not only is it difficult to think of questions more central to our existence—and philosophy has long occupied itself with deliberating on questions of an "ultimate" nature—but also because philosophy is uniquely situated to explore them. Not only do such questions involve an examination of natural world phenomena, such as the extent to which the structure and happenings of that world support or undermine the argument for a supernatural creator's existence, 282 but just as importantly they concern an examination of human experience with claimed supernatural phenomena—such as claimed moral or spiritual leadings through the medium of human consciousness. All of these claims fall easily within philosophy's provenance, being concerned as it is with the entire variety of human experience and the logical inferences and conclusions that can be drawn from Science, on the other hand, is uniquely unsuited to exploring these questions, being deaf as it is to any phenomena that cannot be physically observed, measured, tested, or otherwise interrogated on a material level. And its commitment to methodological naturalism simply prevents it from asking to what extent natural phenomena might support or detract from the case for supernatural beings or planes of reality.

Indeed, as to the origins debate, and as between science and philosophy, at least two of the "Big 3" origins questions—how the universe itself and life on Earth arose (how species and humans originated obviously being the third)—must largely be the subject of philosophical discussion because the current science regarding them is simply too speculative or incomplete to say much that

<sup>279.</sup> Id

<sup>280.</sup> Cf. id. at 58 ("The decision between competing scientific formulations by reference to crucial data obtained by investigation is easier than the resolution of philosophical issues by rational debate."); id. at 65 ("The core of common experience to which the empirical philosopher appeals is the same for all; and common or ordinary experience involves no specialized techniques.").

<sup>281.</sup> See e.g., ETIENNE GILSON, GOD AND PHILOSOPHY 6-9, 112 (2002) (tracing the origins of philosophical thought on God or some other supernatural creator from ancient Greek to modern times).

<sup>282.</sup> See supra note 110 (describing philosophical arguments that have been made over the ages about the world's apparent design based on observations of natural objects and processes).

is definitive.<sup>283</sup> For instance, although cosmologists have postulated the "Big Bang" theory to describe the origin of the currently observable universe, many aspects of that theory have yet to be confirmed and, even then, it does not answer some major questions about that subject—such as exactly how that phenomenon occurred, or what state of affairs, if any, preceded it.<sup>284</sup> And even if science could satisfactorily explain how the origin of the universe and life on Earth occurred through the operation of natural processes, that still would not answer the questions of where such processes came from and why they existed in the first place.<sup>285</sup> Thus, no matter how complete science is on these subjects, there will always be major philosophical questions that remain to be examined about them.<sup>286</sup>

As to the origin of species in general and humans in particular, as discussed above, evolutionary science paints a more complete picture (although far from a fully filled-in canvas). Yet many important philosophical questions remain to be answered, not the least of which are the ultimate "where" and "why" questions just noted as applied to the existence of evolutionary mechanisms such as natural selection. And when arguments are made to refute natural selection as the causal agent for the diversity of species on Earth, such as those of Dembski and Behe, to the extent these arguments do not amount to scientific theories because they are not based on empirically testable, objective data, what they really amount to is philosophical argumentation about the implausibility of that process as an accurate explanation of such diversity. That is because these arguments appeal

<sup>283.</sup> See, e.g., PIGLIUCCI, supra note 241, at 146 (justifying the use of philosophy as a means of logically explaining phenomenon that are not explainable by scientific means).

<sup>284.</sup> Id. at 242-43, 242 n.6.

<sup>285.</sup> Cf. Stephen Hawking, Lucasian Professor of Mathematics, Cambridge University, Origins of the Universe, J. Robert Oppenheimer Lecture in Physics at the University California, Berkeley (Mar. 16, 2007) (transcript available at http://berkeley.edu/news/media/releases/2007/03/16\_hawking\_text.shtml) (presenting an argument, based on Einstein's theories of relativity, that the universe was spontaneously created from nothing) (on file with the Washington and Lee Law Review). Hawking believes that modern astrophysicists and cosmologists are on the way to understanding the mechanics behind the origins of the universe, but he does not posit an answer to the metaphysical questions of whether a supernatural force initiated these first physical processes that created the earth. Id.

<sup>286.</sup> See COLLINS, supra note 20, at 66-70 (asserting the view that many scientific developments and theories, such as the Big Bang theory and current understandings of the formation of our solar system, "cr[y] out for a divine explanation").

<sup>287.</sup> See supra notes 76-77 and accompanying text (discussing acceptance of neo-Darwinian synthesis).

<sup>288.</sup> See PIGLIUCCI, supra note 241, at 54 (comparing advocates of scientific creationism to ID proponents and observing that "[a]t least ID theorists give philosophers (if not scientists) a good run for their money"); see also John Wise, Intelligent Design Is Not Science: Why This

primarily to our experiences and intuitions about the probability of given events occurring, and logical inferences or deductions that may be drawn from our conclusions.

The same holds true for argumentation, based on an *acceptance* of natural selection as the main basis for the origin and diversity of species, when it goes beyond scientific claims about that process. As noted earlier, scientifically-trained commentators like Richard Dawkins frequently make arguments to the effect that when science successfully explains the causation of physical phenomena via the operation of natural processes, this proves the non-existence of any supernatural beings or causation. This is a purely philosophical argument, based solely on Dawkins's own reasoning and conclusions—drawn from his training and experience—about the likelihood of supernatural forces creating or directing the natural processes that science has proven to exist. It is certainly not a scientific argument, since no empirical data supports Dawkins' inferences against any supernatural involvement, and, in any event, such a claim exceeds the scope of science's purview.

Given that these origins debates are mainly philosophical in nature, what, then, would a basic philosophy course on this subject, geared towards upper level high school students, look like? Presumably, it would teach and explore the major arguments that have been made both for and against the existence of a supernatural creator, and its continuing involvement, if any, in our world. As noted earlier, one prominent version of that debate has taken place in recent books by Dawkins and geneticist Francis Collins, the former director of the Human Genome Project.<sup>291</sup>

Matters, THE DAILY CAMPUS, May 4, 2007, at 11, available at http://media.www.smudailycampus.com/media/storage/paper949/news/2007/05/04/Opinion/In telligent.Design.Is.Not.Science.Why.This.Matters-2894591.shtml (arguing that intelligent design is based on philosophical rather than scientific arguments, and criticizing both Dawkins and Collins for making philosophical arguments rather than scientific ones).

<sup>289.</sup> See supra note 17, 149-50 and accompanying text (introducing Dawkins's work and his scientific arguments that natural explanations for phenomena rule out the possible existence of a supernatural creator).

<sup>290.</sup> See, e.g., Massimo Pigliucci, Is Dawkins Deluded? When Scientists Talk about Religion, SKEPTICAL INQUIRER, July/Aug. 2007, at 20–21 (agreeing with Dawkins's ultimate conclusion regarding atheism being the most reasonable answer but nonetheless asserting that "when [Dawkins] says... that the God hypothesis... 'is a scientific question,' he is wrong. It's a philosophical one.").

<sup>291.</sup> While not specifically addressed to each other, Collins's *The Language of God* and Dawkins's *The God Delusion* represent notable articulations of opposing points of view on the question of God's existence. *See generally* COLLINS, *supra* note 20 (discussing Collins's book and contrasting his approach with that of Dawkins). However, Collins and Dawkins did engage in a direct debate on this topic that was sponsored and chronicled by *Time* magazine. *See* David Van Biema, *God vs. Science*, TIME, Nov. 13, 2006, at 48 (engaging the two scholars directly on

In The God Delusion, Dawkins mainly argues that while the existence of a supernatural creator cannot be affirmatively disproven, it can be shown that it is extremely improbable that such a being exists.<sup>292</sup> Interestingly, he seems to agree with ID proponents that the key question is how to explain a natural world that appears to be exquisitely designed in its substance and complexity. 293 But for Dawkins, the mechanism of natural selection provides the complete answer, demonstrating that complexity can arise without conscious design.<sup>294</sup> Moreover, if complexity accretes from simpler life forms, as natural selection has it, then how could a creator, who needs to be even more complex than the complex world it designed, exist? In other words, explaining apparent design by reference to an intelligent creator "immediately raises the larger problem of who designed the designer."<sup>295</sup> Thus, he concludes, such an explanation is untenable, and it is highly probable that such a creator does not exist. 296 As such, his argument appears to be the flip side of Dembski's, who argues that apparent design in life makes it highly improbable that an intelligent creator does not exist.<sup>297</sup>

In *The Language of God*, Collins presents his arguments for why he believes the existence of a divine creator is more probable than not.<sup>298</sup> While Dawkins focuses primarily on the "who created the creator" problem to argue against the existence of such a being,<sup>299</sup> Collins's arguments in favor of a

the issue of evolution versus intelligent design). Many different versions of this debate exist. Another notable one, for example, is provided by comparing the writings of C.S. Lewis and Sigmund Freud on this subject, two twentieth-century intellectual giants who were on opposite sides of the debate. See NICHOLI JR., supra note 21, at 37 (presenting Lewis and Freud's differing philosophies on the existence of a divine creator).

<sup>292.</sup> See DAWKINS, supra note 17, at 113 (noting that "[t]he argument from improbability, properly deployed, comes close to proving that God does not exist").

<sup>293.</sup> Id. at 79, 113-34.

<sup>294.</sup> See id. at 79, 114, 141 (characterizing natural selection as the logical solution to the improbability of intelligent design or the alternative that life began as a matter of pure chance).

<sup>295.</sup> Id. at 158.

<sup>296.</sup> Id.

<sup>297.</sup> See DEMBSKI & WELLS, supra note 126 and accompanying text (arguing that such organization in living systems is evidence of a purposeful design rather than of chance occurrence).

<sup>298.</sup> See generally COLLINS, supra note 20.

<sup>299.</sup> Interestingly, Dawkins also makes a positive argument for atheism in his discussion of the anthropic principle (the idea that conditions on earth and in the universe are precisely tuned to allow for the existence of life). DAWKINS, *supra* note 17, at 134–51. He argues that the mystery of why life exists is answered by two alternatives: God or the anthropic principle. *Id.* at 136. Dawkins concludes that we exist because we happen to be on a planet and in a universe that can sustain life, not because God willed us to exist. *Id.* at 141. Beyond providing these arguments in order to assert the improbability of God's existence, Dawkins also attempts to

creator are more numerous and diverse. He first points to the presence of a "Moral Law" that he sees as "a universal feature of human existence," wherein "the concept of right and wrong appears to be universal among all members of the human species (though its application may result in wildly different outcomes)." Moreover, another universal aspect of the human experience Collins discerns is a "uniquely human hunger... [or] longing for the sacred." The commonality of the foregoing human experiences, in his view, point towards a supernatural creator attempting to communicate with its created beings. 302

Other signs that point to an intelligent creator for Collins include the "simple and beautiful [mathematical] . . . equations that describe the reality of the natural world,"<sup>303</sup> the way in which the Big Bang theory of the origins of the universe "cries out for a divine explanation,"<sup>304</sup> and the way in which, had physical constants of numerous natural forces varied even slightly, human life could never have arisen (i.e., how the universe appears to have been fine tuned to give rise to, and support, human life).<sup>305</sup> Collins also has a response to Dawkins's conundrum. He notes that, especially in light of the Big Bang, "I cannot see how nature could have created itself. Only a supernatural force that is outside of space and time could have done that."<sup>306</sup> In other words, to make judgments about the existence of a complex creator using the yardstick of how complexity arose in the natural world is misplaced. Such a creator would necessarily be operating from outside its creation, and would not be subject to

refute a number of traditional arguments for God's existence. See id. at 75–109 (providing brief summaries of various non-scientific arguments for the existence of God, some serious and some humorous, and dismissing them all). Perhaps it is in this chapter that Dawkins's work is most obviously philosophical and non-scientific, since some of the arguments that he engages are quintessentially philosophical arguments. Id.

- 301. COLLINS, *supra* note 20, at 29–30.
- 302. Id. at 38.
- 303. Id. at 62.
- 304. Id. at 67.

<sup>300.</sup> COLLINS, *supra* note 20, at 22–23. Collins bases this line of reasoning on C.S. Lewis's arguments for the existence of God set out in his classic work, *Mere Christianity*. C.S. LEWIS, MERE CHRISTIANITY (Scribner 1952) (1943). Lewis argues that a universal moral law is known to each human person. *Id.* at 3–7. This law is as universal as the laws of nature, and yet our knowledge of it is not dependent on how our observation of nature works. *Id.* at 13–16. The universality and uniformity of the moral law, according to Lewis, is an argument for a supernatural lawgiver. *Id.* at 17–20, 22–25.

<sup>305.</sup> Whereas Dawkins sees this "anthropic principle" as a sign that life is a product of chance, Collins sees the fine-tuned universe we live in as evidence of a divine creator. Collins, supra note 20, at 78.

<sup>306.</sup> COLLINS, *supra* note 20, at 67.

the same natural laws of evolution that it put in place. In short, one cannot make judgments about a supernatural plane of reality based solely on observations about how the natural world works.<sup>307</sup>

Besides the arguments that Dawkins and Collins make, our philosophy of origins course might also cover other major arguments that have been made through time both for and against the existence of a supernatural creator. On the "for" side, such arguments include those of a cosmological nature that were made long ago by St. Thomas Aquinas in his influential *Summa Theologica* and other works: For instance, to oversimplify somewhat, that nothing can cause its own existence and, thus, an uncaused cause must exist;<sup>308</sup> that unintelligent processes in nature seem to act towards a purposeful end, and thus must be ultimately directed by an intelligent designer;<sup>309</sup> and that time must have a beginning, a first moment that gives rise to all other moments.<sup>310</sup> Another includes St. Augustine's argument that our mind's ability to perceive eternal and objective truths, such as mathematics or logic, demonstrates the existence of a supernatural realm because that which is eternal is not of the natural world.<sup>311</sup>

There is also the time-honored argument from purported miracles—that there is scientific and historical evidence of phenomena where the physical laws of nature appear to have been violated or suspended, and no explanation other than supernatural causation seems possible.<sup>312</sup> And, of course, arguments drawn from the ID movement about the improbability of apparent design in

<sup>307.</sup> See also LEWIS, supra note 300, at 19 ("If there is a controlling power outside the universe, it could not show itself to us as one of the facts inside the universe—no more than the architect of a house could actually be a wall or staircase or fireplace in that house.").

<sup>308.</sup> PETER KREEFT, A SUMMA OF THE SUMMA: THE ESSENTIAL PHILOSOPHICAL PASSAGES OF ST. THOMAS AQUINAS' SUMMA THEOLOGICA EDITED AND EXPLAINED FOR BEGINNERS 60–70 (1990). Aquinas's argument in this regard appears to anticipate and support Collins's argument, see *supra* note 304 and accompanying text, for a supernatural creator based on the Big Bang, and to anticipate and refute Dawkins's argument, see *supra* notes 295–97 and accompanying text, as to who designed the Designer.

<sup>309.</sup> Kreeft, supra note 308, at 69. The modern ID movement is perhaps a variation on Aquinas's argument here, though far from identical to it. Aquinas made the philosophical observation that things without intelligence operate according to laws to achieve certain ends, what we might call "laws of nature." Id. He argued that things which lack intelligence do not move toward an end without being directed by intelligence. Id. This line of reasoning differs from ID arguments in that it does not claim to scientifically detect design inherent in complex organisms and structures, and could even be used to support a version of theistic evolution that incorporated the theory of natural selection.

<sup>310.</sup> Id. at 61 n.19.

<sup>311.</sup> Id.

<sup>312.</sup> See generally C.S. LEWIS, MIRACLES (Macmillan 1960) (arguing that God supernaturally intervenes in the universe through miracles).

nature arising by chance or undirected processes could be analyzed and discussed provided they did not contradict pertinent scientific evidence.<sup>313</sup> The same could even be said for major origins theories based on purported revelations in sacred texts, so long as they were examined critically using the same standards of logical and experiential analysis as any other theory (including that they were not in conflict with existing scientific evidence). Thus, for instance, the more allegorical interpretations of the Genesis creation that are consistent with an Earth that is billions of years old might be considered.<sup>314</sup>

On the other side of the coin, besides Dawkins's argument, other major ones against the existence of a supernatural creator that might be considered include, first and foremost, the problem of evil in the world. How can evil exist in a world created by a supernatural being that is allegedly both omnipotent and omnibenevolent? Other major arguments that might be discussed include certain variations on Dawkins's main argument discussed above (to wit, that increased understandings of evolution made a divine creator unnecessary, and in any event such an explanation is too complex and improbable considering the paucity of empirical evidence of such a being), supernatural creator would not have created nature so imperfectly, the ideas of a creator and religion are nothing other than an invention of our own projected desires (a phenomenon that evolutionary biology and neuroscience increasingly claim to support), the variety of religious sects that claim to teach reality and truth notwithstanding the existence of many points of conflict

<sup>313.</sup> As noted earlier, philosophy is informed by scientific and other empirical evidence in addition to relying on logic and experience. *Supra* notes 276–82 and accompanying text. Thus, origins theories or arguments that contradicted existing scientific evidence would be inappropriate to teach even from a philosophical perspective.

<sup>314.</sup> See, e.g., PIGLIUCCI, supra note 241, at 36–40 (describing different creationist positions, each with varying degrees of acceptance of evolutionary theory).

<sup>315.</sup> See, e.g., B.C. Johnson, God and the Problem of Evil, in PHILOSOPHY AND CONTEMPORARY ISSUES 137, 137–42 (John R. Burr & Milton Goldinger eds., 2004) (arguing that an omnipotent, good God could not allow evil to exist).

<sup>316.</sup> See, e.g., Richard Dawkins, The Improbability of God, in PHILOSOPHY AND CONTEMPORARY ISSUES, supra note 315, at 112, 112–17 (making such additional arguments).

<sup>317.</sup> See, e.g., John Hick, The Problem of Evil, in PHILOSOPHY AND CONTEMPORARY ISSUES, supra note 315, at 143, 143–47 (examining arguments for and against God's existence in light of evil, pain, and suffering).

<sup>318.</sup> See Steven Pinker, Whence Religious Belief?, in SCIENCE AND RELIGION 311,311–14 (Paul Kurtz ed., 2003) (questioning the rationality of religious beliefs while describing humanity's resort to religion as a tool for success).

in such teachings, <sup>319</sup> and certain logical arguments that seek to refute a creator's existence. <sup>320</sup>

All of the foregoing arguments constitute affirmative arguments for and against, respectively, the existence of a supernatural creator. Of course, each of these arguments would presumably have refutations by experts opposed to them, which would need to be taught and considered contemporaneously in order for a proper assessment to be performed.<sup>321</sup> But it is important to emphasize that all of these arguments are primarily philosophical in nature; they are informed by science and the empirical world, but they are grounded in arguments drawn from logic and common human experience. None of these arguments would be appropriately taught in a science class because they are either not based in empirical analysis, or, to the extent they have an empirical component, they present questions that science has yet to answer. However, as noted above, whenever there was scientific evidence that refuted an argument, it would not be appropriate to continue teaching it as a philosophical matter. It would simply defy logic and human experience to propose as a candidate for truth an explanation or argument that rests on empirical facts that science has demonstrated to be false.

This brings us to the question of whether, were a public high school inclined to offer an age-appropriate philosophy of origins course to address the ongoing "religion as science" contests and the general lack of comprehensive educational content designed to assist students with their worldview formation, there exist any legal limitations on its ability to do so. At first blush, the main issue here appears to be whether such a course could be taught consistently with the Establishment Clause because it would center on the soundness and persuasiveness of philosophical arguments both for and against the existence of a supernatural creator, and might at times focus on religious doctrine or teachings as a source for a particular origins theory. However, as I will seek to demonstrate in Part IV, as long as such theories and arguments were taught and

<sup>319.</sup> See, e.g., Kai Nielsen, Does God Exist? Reflections on Disbelief, in PHILOSOPHY AND CONTEMPORARY ISSUES, supra note 315, at 126, 311 ("Why then opt for any particular one [religion]? Why claim or believe that a certain religion is the Truth and the Way? And if there is no decent answer to these questions, why go in for any religious faith at all?").

<sup>320.</sup> See William E. Mann, Paradoxes of Omnipotence, in THE CAMBRIDGE DICTIONARY OF PHILOSOPHY, supra note 54, at 643 (describing logical paradoxes that arise from the existence of an omnipotent being). Among such logical arguments is the so-called "paradox of the stone": "Can God create a stone too heavy for God to move? If God can, then there is something God cannot do—move a stone—and if God cannot, then there is something God cannot do—create such a stone." Id. at 644.

<sup>321.</sup> See, e.g., supra note 299 (discussing Dawkins's critiques of major arguments for a supernatural creator).

discussed as matters of philosophical inquiry and not as religious views or beliefs, such a course would comport with that clause. I will also offer suggestions on measures a school might adopt to provide assurance that such a course would not stray across constitutional lines.

#### IV. Teaching a Philosophy of Origins Course in Public High Schools

## A. Could Such a Course Be Taught Consistent with the Establishment Clause?

The Establishment Clause of the First Amendment prohibits the government from making any "law respecting the establishment of religion..." As noted earlier, the U.S. Supreme Court has generally interpreted this provision to prohibit laws or other government actions that have the purpose or primary effect of advancing or inhibiting religion. In other words, government neutrality towards religious beliefs, views, and practices—neither favoring them nor discriminating against them—is the touchstone of that clause's demands. Thus, as applied in the "teaching of origins" context, when Arkansas barred the teaching of evolution in its public schools, when Louisiana required that equal time be devoted to creation science whenever evolution was taught, the Court determined that those States

<sup>322.</sup> U.S. CONST. amend. I.

<sup>323.</sup> See Lemon v. Kurtzman, 403 U.S. 602, 612–13 (1971) (articulating what is commonly referred to as the Lemon test: "[T]he statute must have a secular legislative purpose; second, its principal or primary effect must be one that neither advances nor inhibits religion . . . finally, the statute must not foster 'an excessive government entanglement with religion'"(quoting Walz v. Tax Comm'n, 397 U.S. 664, 668 (1970))). Despite frequent criticisms and inconsistent application of the Lemon test by members of the Court, it has never been overruled and appears to remain the dominant Establishment Clause standard at this time. See, e.g., McCreary County, Ky. v. Am. Civil Liberties Union of Ky., 545 U.S. 844, 859 (2005) (applying the Lemon test to the display of the Ten Commandments on the grounds of county courthouses). If the entanglement prong of Lemon's test retains any vitality, however, it is principally in the area of religious financial aid cases. See, e.g., Agostini v. Felton, 521 U.S. 203, 232 (1997) (treating the entanglement prong as part of the primary effects test in a religious funding case).

<sup>324.</sup> See McCreary County, Ky., 545 U.S. at 860 ("The touchstone for our analysis is the principle that the First Amendment mandates government neutrality between religion and religion, and between religion and non religion.") (quotation omitted). Justices Scalia and Thomas, however, are leading a movement to allow government to recognize, and in some ways favor, the general theistic beliefs of the West. *Id.* at 885–900 (Scalia, J., joined by Rehnquist, C.J., and Thomas, J., dissenting).

<sup>325.</sup> Supra notes 93-97 and accompanying text.

<sup>326.</sup> Supra notes 102-06 and accompanying text.

violated the principle that the government shall not purposefully attempt to advance religious doctrines.

By its terms, the proscriptions of the Establishment Clause concern the government's involvement in religion; the founding generation believing that religious freedom was best promoted by keeping the government from attempting to adopt one religious sect as the nation's official religion and church, and, conversely, from disadvantaging other religious sects (primarily Christian sects at the time of the founding).<sup>327</sup> It is clear that the clause was mainly concerned with the government's relationship to organized religious groups, and their beliefs and practices, with the ultimate objective being to maximize the religious freedom of Americans.<sup>328</sup>

What, then, do the language and purposes of the Establishment Clause have to say about the government conducting a high school class in the philosophy of origins? Would such a class have as its purpose to advance or inhibit religion? And, if not, would it nonetheless have a primary effect of doing so? The closest the Court has come to providing an answer to these questions lies in its oft-repeated assertion that public school educators can teach about religion as long as the subject is "'presented objectively as part of a secular program of education . . . .'" In other words, while teaching religious beliefs or doctrines as truth would amount to an attempt to unconstitutionally establish religion, it would not be such an establishment for educators to teach about, say, the literary or historic qualities of a religious text such as the Bible, or to teach a course in comparative religion or the history of religion. There is a critical constitutional difference, then, between objectively analyzing religious subjects in public schools to assist students in understanding them and attempting to proselytize or indoctrinate students in a given religious belief.

Accordingly, as to the *purpose* test of the Court's establishment analysis, what these assertions suggest is that the government will not be held to have an

<sup>327.</sup> See, e.g., GREENAWALT, supra note 25, at 39 (noting that the Establishment Clause originally had a dual purpose to prevent the new federal government from establishing a particular religion or church and to prevent that government from interfering with churches that were then established in various states).

<sup>328.</sup> At least, that is, maximizing the religious freedom of citizens vis a vis the new federal government. See supra note 327.

<sup>329.</sup> Lynch v. Donnelly, 465 U.S. 668, 679–80 (1984) (quoting Sch. Dist. of Abington Twp., Pa. v. Schempp, 374 U.S. 203, 225 (1963)).

<sup>330.</sup> See Schempp, 374 U.S. at 225 ("[I]t might well be said that one's education is not complete without a study of comparative religion or the history of religion and its relationship to the advancement of civilization. It certainly may be said that the Bible is worthy of study for its literary and historic qualities."). The Court adds: "Nothing we have said here indicates that such study of the Bible or of religion, when presented objectively as part of a secular program of religion, may not be effected consistently with the First Amendment." *Id*.

unconstitutional purpose of advancing religion merely because it attempts to teach students about it. And this is so despite the fact that one could plausibly argue that by teaching students about religion, the government knows it will likely be advancing it to some degree since there will inevitably be some cases when a student adheres to (or has her faith strengthened in) a given religion as a result of learning (or learning more) about it.<sup>331</sup> But as long as there is no evidence that the government's purpose is to achieve such incidental effects of teaching about religion, and its sole purpose is to assist students in better understanding religious subjects or issues, it is not acting in an unconstitutional manner.

As to the *primary effects* test of the establishment analysis, the foregoing assertions by the Court suggest that such a standard may be ill-suited to assessing the constitutionality of teachings involving religious subjects. This follows from the possibility, for instance, that in given cases students who learn more about a particular religion might be led to become adherents of it, and school officials or employees might never know this had happened. In such cases, how would one assess whether the teachings had a primary effect of advancing religion? Even putting aside the problem of learning about the effects of such teaching, how would one measure whether the teachings primarily made students more knowledgeable about religion or, alternatively, primarily advanced the religion by gaining converts to it? By counting the number of students who simply learned about the religion, as opposed to those that both learned about it and converted to it? These problems demonstrate that a straightforward application of a primary effects analysis to the issue of teaching about religion is somewhat incoherent and impracticable, and probably would not be an establishment test the Court would apply to this issue.

However, in more recent years, the Court has developed two other criteria it sometimes employs beyond the standard *Lemon* analysis for measuring whether a law or government act has a primary effect of advancing religion. The first is to ask whether the law or act in question creates an *appearance* to the "reasonably informed observer" (i.e., a person familiar with the background context and purpose of a law or act) that the government is *endorsing* religion—as this might be another way religion might be "advanced" by the state. The second is to inquire whether the law or act has the effect of

<sup>331.</sup> Conversely, the opposite might happen as well. In situations when a student's faith beliefs are undermined by such teaching the government would likewise not be unconstitutionally *inhibiting* religion.

<sup>332.</sup> Santa Fe Indep. Sch. Dist. v. Doe, 530 U.S. 290, 308 (2000).

coercing someone into participating in religious practices by creating a situation in which there is peer pressure to do so, or by some other means.<sup>333</sup>

What do these more recent standards for measuring primary effects say about teaching religion? Assuming the Court adheres to its earlier pronouncements regarding the constitutionality of teaching about religion, and there is no reason to believe it would not, what this has to mean is that such teachings by public educators would not be deemed to place the government's endorsement on religion, and nor would such a class be deemed to improperly coerce students into believing religion or engaging in religious practices. And this would make sense. As to endorsing religion, no reasonable observer of a school class about religion who was informed regarding the government's typical purpose for offering it—to, say, promote understanding of different religions or their role in the history of human affairs—would view the government as endorsing the religious beliefs and practices being taught so long as those subjects were "'presented objectively as part of a secular program of education . . . . "334 This is the basic difference between trying to promote the understanding of various ideas, opinions, or teachings, and trying to persuade a person as to their truth or validity. With respect to the coercion standard, most school classes are somewhat coercive in the sense of forcing students to think about, and often participate in discussions about, a given subject in an attempt to foster an understanding of it. The same holds true for a class teaching about religion. But, again, taught properly, it is difficult to see how such a class would coerce students into believing the religion was true or to engage in religious practices.<sup>335</sup>

In sum, under the relevant Establishment Clause tests used by the Court, in the context of teaching courses about religion, it is clear that public schools only act unconstitutionally when they have the purpose of advancing or inhibiting religion as a matter of truth, or otherwise appear to be endorsing religion as truth or coercing students into actually believing or practicing it. How, then, would these principles apply to a basic philosophy of origins course offered by public high schools? Would such a course be more like one that seeks to teach about religious subjects or like one that teaches certain religious views as truth?

In its consideration of different views on creative versus non-creative action in the universe, a philosophy of origins course would be analogous to a more general philosophy of religion course that typically focuses on examining

<sup>333.</sup> Id. at 310-13.

<sup>334.</sup> Supra note 329 and accompanying text.

<sup>335.</sup> See infra Part IV.C for a discussion of the proper way to teach such a class.

the rationality of claims related to the existence or non-existence of a divine being and other religious issues, <sup>336</sup> although an origins course would have a narrower focus on positions about how the universe, the earth, life, and the human species came into existence. Thus, such an origins course would essentially combine a consideration of certain issues from the philosophy of religion, of which an origins course could be considered a subset, with certain issues from the philosophy of science (such as what Darwinian evolution implies about the presence or lack of supernatural action in creating the human race). <sup>337</sup>

Discussions about religious questions in either a philosophy of religion or origins class would differ markedly from, say, a "Sunday school" class that sought to teach the beliefs and tenets of a particular religion, or even a class on the theology of a particular religion or religious sect. This is because a class teaching religious beliefs obviously assumes the truth of what it teaches (and is generally taught that way), as does a more theological exploration of issues. A course in Christian theology, for instance, would generally assume the truth of the fundamental tenets of Christianity, and seek to explore, defend, and synthesize them in relation to other fields of knowledge. 338 In stark contrast. philosophy of religion investigates, in an objective, critical, and systematic manner, the rationality of such claims to truth using the tools of logic, experience, and evidence. 339 The same can be said for a philosophy of origins course examining religiously-based claims about how things began, applying the same rationality analysis to them as it would to claims grounded in science. In short, religious and theological courses teach religious beliefs and their relationship to other subjects, while a philosophy of religion or origins course

<sup>336.</sup> See, e.g., Michael Martin, Three Courses in Philosophy of Religion, APA NEWSL. (American Philosophical Association, Newark, DE) Fall 1997, available at http://www.apa.udel.edu/apa/archive/newsletters/v97n1/teaching/three.asp (suggesting approaches to teaching philosophy of religion) (on file with the Washington and Lee Law Review).

<sup>337.</sup> See, e.g., Lawrence Sklar, Philosophy of Science, in THE CAMBRIDGE DICTIONARY OF PHILOSOPHY, supra note 54, at 700 ("[T]he branch of philosophy that is centered on a critical examination of the sciences: [T]heir methods and their results . . . . Typical questions explored might be metaphysical presuppositions of space-time theories . . . the structure of explanations in evolutionary biology, and the like.").

<sup>338.</sup> See, e.g., Daniel L. Migliore, Faith Seeking Understanding: An Introduction to Christian Theology 1–7 (2nd ed. 2004) (describing theology as faith seeking understanding).

<sup>339.</sup> See Philip L. Quinn, Philosophy of Religion, in THE CAMBRIDGE DICTIONARY OF PHILOSOPHY, supra note 54, at 696 ("Modern philosophers of religion have, for the most part, confined their attention to topics treatable without presupposing the truth of any particular tradition's claims about revelation and have left the exploration of mysteries of faith to the theologians of various traditions.").

teaches critical and rational thinking about those beliefs themselves and, in particular, the assumptions, arguments, and reasons underlying them.<sup>340</sup>

In this sense, then, a philosophy of religion or origins course would be much more akin to teaching about religion or religious beliefs than teaching that promoted or endorsed those beliefs themselves. Such courses subject religious beliefs, including those concerning the existence and actions of a supernatural creator, to critical, logical analysis rather than teaching their truth or validity as matters of faith and revelation.

But, one might object, what about circumstances in which a teacher's lecture, or the tenor of a class discussion, appeared to support the view that logic, experience, and evidence made a stronger case for supernatural creative action than origination via undirected natural forces? Unlike a comparative religion course or one on the history of religion, the objection might continue, which aim chiefly to *describe* or *explain* the beliefs and practices of various religions or the role of religion in world history, a philosophy of origins course would not only describe or explain different views or positions on origins questions, it would *critically evaluate* them in terms of assessing their rationality and soundness, would it not? Would such a course then amount to teaching religious beliefs as true?

The short answer to this last question is "no." It is one thing to evaluate the rationality of arguments or reasons for believing something about the nature of reality, opining on the extent to which they appear to be compelled by, and consistent with, logic, experience, and evidence. It is quite another to take the additional step of making an assertion based on the analysis that the belief must be true or false—at least, that is, where the belief is not subject to empirical verification as in most matters relating to questions of ultimate origins. The latter step is purely one of personal judgment and conviction. As long as a teacher did not take this additional step, leaving such a determination to the individual judgment of each student, the school would not cross the line separating teaching about religious matters and teaching religious beliefs as true. And, of course, the same principles would hold for the obverse situation in which a lecture or discussion appeared to support the view that a critical analysis of origins perspectives made a stronger case for a materialistic account than a supernatural one.<sup>341</sup>

<sup>340.</sup> It should be noted that by contrast, a comparative history of religion class is primarily descriptive in nature, although the latter might engage in critical analysis of the strength of competing claims about the influence of religion in history or other matters.

<sup>341.</sup> This is not to say, however, that a school should not implement additional prophylactic measures to help ensure that the teaching of such a course remained within constitutional bounds, such as prohibiting a teacher from offering her own views on the

Admittedly, there is a large hole or grey area that exists between the Court's assertions regarding teaching about religion and teaching religious beliefs as true. On the one end of the spectrum are objective descriptions or explanations about religion, at the other end are more subjective assertions about what is true, but in the center lies an area of critical analysis about religious claims to truth: Represented linearly, it is the difference between About—Analysis—Assertion. Although I have argued that the first two categories of teaching fall within constitutional parameters, a school might reasonably take the prophylactic measure in a philosophy of origins course of structuring the class to remain in the first zone of merely describing or explaining different arguments or perspectives on origins (without any critical analysis of their strengths or weaknesses). Such a measure would be prophylactic in the sense of staying far away from having a teacher suggest, as a result of critical analysis, that the rationality or soundness of an argument regarding origins meant that the ultimate belief supported by it was, in fact, a true description of reality (i.e., avoiding Analysis in order to prevent crossing the line into Assertion). But such a "sanitized" course would hardly be philosophical in a true sense of that discipline, and students would be deprived of much of the course's value in terms of developing their depth of understanding and own worldview formation. In Part IV.C, I will recommend certain measures that a school could take to help ensure that a course involving critical analysis could be safely offered while minimizing constitutional concerns.

Moreover, to the extent there is any Establishment Clause ambiguity regarding the constitutionality of teaching about arguments supporting ultimate religious beliefs (including the belief that no supernatural being exists or was involved in various origins events) or the critical analysis thereof, another provision of the First Amendment—the Free Speech Clause—would counsel resolving it in favor of the permissibility of such teachings and discussions. It is to that discussion that I now turn.

## B. The Free Speech Clause as a Mediator of Establishment Clause Ambiguity in the Public School Classroom

When it comes to free speech rights of students in public primary or secondary schools, the Court has famously said that students do not "shed their constitutional rights to freedom of speech or expression at the schoolhouse

apparent *philosophical soundness* of various arguments or perspectives that are discussed. Indeed, in Part IV.C, *infra*, I recommend that such a measure be taken.

gate."<sup>342</sup> At the same time, however, the Court has never suggested that school educators do not have the right to control student speech in the classroom. School officials have the right to determine curriculum content, and a teacher has the right to lecture and control classroom discussion as appropriate to properly teach such content.<sup>343</sup> However, the right of students to speak in the classroom is not the issue in the present context. Here, the question is, assuming a school district desired to offer a basic philosophy of origins course in its high schools to address the "religion as science" conundrum and otherwise prepare students for this ongoing public debate, would the Free Speech Clause play a role in addressing any Establishment Clause ambiguities associated with doing so?

To answer this question, we must first identify the relevant speech rights at stake. They would not likely be those of the school district itself, since the Court has been unclear and ambivalent on whether government units even enjoy First Amendment protections against other units of government (such as, in this case, a lower court that might attempt to enjoin an origins course pursuant to its reading of the Establishment Clause). They would also not likely be the rights of the teacher himself or herself. The Court has not addressed the existence or scope of a public school teacher's free speech rights in the classroom, but many lower courts have, and generally hold that such rights are very limited (at least when they conflict, as in the typical situation, with the curricular desires of the school district). But when the school district and teacher's desires are aligned, such as in a situation when the district desired to offer an origins course and a teacher was willing to teach it, the teacher would likely be treated as the district's agent—and subject to the same questionable rights as the district itself.

However, the Court has been clear that free speech rights generally include a right to receive ideas and information that a speaker desires to

<sup>342.</sup> Tinker v. Des Moines Indep. Cmty. Sch. Dist., 393 U.S. 503, 506 (1969) (holding that a prohibition on wearing armbands to high school was an unconstitutional denial of the students' right of free expression).

<sup>343.</sup> See, e.g., Borger by Borger v. Bisciglia, 888 F. Supp. 97, 99 (E.D. Wis. 1995) ("Students do not lose their First Amendment rights when they walk through the schoolhouse door.... However, courts have decided that the scope of the First Amendment within the classroom must be tempered, and that the content of the curriculum is within the sound discretion of school officials, with exceptions in rare cases.").

<sup>344.</sup> See, e.g., U.S. v. Am. Library Ass'n, 539 U.S. 194, 210–11 (2003) (plurality opinion) (declining to decide whether government entities enjoy First Amendment rights).

<sup>345.</sup> See, e.g., Peloza v. Capistrano Unified Sch. Dist., 37 F.3d 517, 522-23 (9th Cir. 1994).

communicate.<sup>346</sup> In *Board of Education v. Pico*,<sup>347</sup> a three-justice plurality of the Court applied this right in the public school context, holding that the school board's removal of certain books from the school library could violate the students' right to receive information if such actions were motivated by improper reasons.<sup>348</sup> While four dissenting justices disagreed with the extension of that right to public school students,<sup>349</sup> this was in the context of a dispute between the school officials and certain students (together with their parents) over what books were appropriate for a public school library. In a situation when, as with our postulated origins course, the interests of school officials and students were aligned because the former wished to offer such a course and the latter desired to take it, a larger number of justices than the *Pico* plurality would likely be inclined to view it as implicating strong free speech interests of the students.

The question then would be, assuming some students and parents sued to enjoin a public high school from teaching an origins course on Establishment Clause grounds, how the Court might go about reconciling these competing constitutional guarantees. That body has not decided many cases involving clashes between free speech rights and the Establishment Clause, but in the ones it has decided the Court evinced a tendency to resolve such disputes in favor of speech rights. Virtually all of these cases have involved situations where a governmental body, mostly public schools or universities, allowed part of its property or funds to be used for various expressive activities but explicitly excluded religious expression because of concerns about violating the Establishment Clause. In all five of these cases, the Court held that the

<sup>346.</sup> See, e.g., Barry P. McDonald, The First Amendment and the Free Flow of Information: Towards A Realistic Right to Gather Information in the Information Age, 65 OHIO ST. L.J. 249, 250 (2004) (citing Martin v. City of Struthers, 319 U.S. 141 (1943) and Stanley v. Georgia, 394 U.S. 557 (1969)).

<sup>347.</sup> Bd. of Educ. v. Pico, 457 U.S. 853 (1982).

<sup>348.</sup> See id. at 871 ("If petitioners intended by their removal decision to deny respondents access to ideas with which petitioners disagreed, and if this intent was the decisive factor in petitioners' decision, then petitioners have exercised their discretion in violation of the Constitution.") (internal citations omitted). Two other Justices concurred with the plurality's result on different grounds. See id. at 878 (Blackmun, J., concurring in part and concurring in the judgment) ("[T]he principle involved here is both narrower and more basic than the 'right to receive information' identified by the plurality."); id. at 884 (White, J., concurring in the judgment) ("We should not decide constitutional questions until it is necessary to do so, or at least until there is better reason to address them than are [sic] evident here. I therefore concur in the judgment of affirmance.").

<sup>349.</sup> See id. at 885–93 (Burger, C.J., dissenting) (arguing that students do not enjoy a right to access specific books in a school library).

<sup>350.</sup> See infra note 351 (discussing Supreme Court precedent addressing this issue).

<sup>351.</sup> See Good News Club v. Milford Cent. Sch., 533 U.S. 98, 120 (2001) (finding that a

exclusions violated the religious speakers' free speech rights, essentially on the theory that religious expression was entitled to equal constitutional treatment as secular expression absent a clear and convincing case that allowing the former would result in an Establishment Clause violation.<sup>352</sup> And in none of these cases did the Court find such a violation even though they involved such religiously-infused situations as a large cross displayed on the lawn of a state capitol building,<sup>353</sup> Bible lessons being taught in a public school,<sup>354</sup> and government funds being used to produce a religiously-oriented student newspaper.<sup>355</sup> It seemed clear that the Court was resolving Establishment Clause ambiguities in favor of free speech rights in order to vindicate the "all speech is equal" principle, including speech of a religious nature.<sup>356</sup>

One could argue, on the strength of these precedents, that any Establishment Clause ambiguities regarding the teaching of an origins course, both in terms of describing the competing arguments and critically analyzing them, should be resolved in favor of the free speech rights of the students—and especially because such a course would not involve religious expression per se but rather expression about a subject that included religious and non-religious beliefs, and the reasons supporting them. However, a counterargument could be made that these precedents are different than the origins proposal because they involved the government attempting to distance itself from religious activities of third parties as opposed to *itself* teaching subjects touching on

school violated the Constitution in denying a Christian club the use of school facilities); Rosenberger v. Rector & Visitors of Univ. of Va., 515 U.S. 819, 845 (1995) (finding a constitutional violation when a university denied funding for printing a student newspaper with a Christian editorial perspective); Lamb's Chapel v. Ctr. Moriches Union Free Sch. Dist., 508 U.S. 384, 395 (1993) (finding a constitutional violation where a public school denied a church request to use school facilities solely because of the religious nature of the program); Widmar v. Vincent, 454 U.S. 263, 277 (1981) (finding a constitutional violation when religious groups were excluded from using university facilities); see also Capitol Square Review & Advisory Bd. v. Pinette, 515 U.S. 753, 770 (1995) (addressing the use of state capitol grounds for expressive purposes).

- 352. See generally cases cited supra note 351. But cf. Locke v. Davey, 540 U.S. 712, 725 (2004) (holding that state did not violate the Free Exercise Clause by refusing to fund devotional theology instruction due to concerns about violating a state constitution's establishment clause).
  - 353. Capitol, 515 U.S. at 770.
  - 354. Good News Club, 533 U.S. at 120.
  - 355. Rosenberger, 515 U.S. at 845.
- 356. This equality principle serves as the main basis for the Court's general prohibition against content discrimination in free speech law. See Barry P. McDonald, If Obscenity Were to Discriminate, 103 Nw. U. L. Rev. 475, 482 (2009); Barry P. McDonald, Speech and Distrust: Rethinking the Content Approach to Protecting the Freedom of Expression, 81 NOTRE DAME L. Rev. 1347, 1357 (2006) (discussing origin of content discrimination principle).

religious beliefs. But this does not change the fact that in those cases the Court essentially forced the government to engage with religious speakers on an equal basis with other speakers, and "blessed" those arrangements from an Establishment Clause perspective.

Analogously, with respect to offering an origins course, the government would simply be engaging in expression about religious beliefs and perspectives on an equal basis with scientific and other perspectives on the subject, all within a secular program of education designed to teach students a broad array of topics deemed important to a student's education. For these reasons, it seems that the free speech rights of students desiring to receive such ideas and information would trump any competing Establishment Clause concerns about offering such a course, at least in the grey areas discussed above when the Court has not spoken to the constitutionality of teaching one of this nature.

Of course, as with even a basic descriptive course on, for instance, comparative religions, a basic philosophy of origins course would need to be structured and taught properly in order to keep it within permissible constitutional limits—in terms of the linear conception described above, within About and Analysis rather than Assertion. Just how a school district could go about accomplishing this goal is the subject of the next and last section of this Article.

## C. Keeping a Philosophy of Origins Course Within Permissible Constitutional Bounds

Having argued and concluded that it would be constitutional for a public high school to offer a course explaining, discussing, and analyzing competing perspectives on life and human origins provided it was properly structured and taught, the next question becomes how school officials might go about doing this. The primary object here would be to structure and teach such a course in a manner that allowed for a healthy discussion and exchange of views with respect to different origins perspectives, while maintaining balance, objectivity, and neutrality in their presentation and exploration—and certainly to keep such a class from entering the forbidden territory of teaching that a religious or non-religious view of origins was true. This subject can be usefully examined by looking at four main areas of course planning and implementation that would need to take such considerations into account: the general structuring of the

<sup>357.</sup> See supra notes 329-30 and accompanying text (outlining the permissibility of teaching about religion within a secular education).

course and its promotion to students, the educational materials that would be used in class, the preparation of teachers to conduct such a course, and how it was actually taught in the classroom.

In regards to fitting a basic philosophy of origins course within a high school curriculum, given its mature subject matter, it would probably be appropriate to only allow junior and senior level students to enroll in it. Not only might younger students have difficulty understanding the arguments and perspectives presented, even in versions that have been simplified somewhat for presentation at an upper-class high school level (as they would need to be), but, just as importantly, younger students might not appreciate the stated mission of such a course—to make an objective presentation of views on both sides of the creator versus non-creator divide and not to endorse or promote one view over another. In this regard, younger students taught to believe one view or another might feel that such a course was threatening their beliefs, as opposed to helping them understand a wide range of views people hold on the subject and to assist them in the ongoing development of their own worldviews.

Moreover, at least until some experience with such a course had been gained, it would probably be appropriate to make it an optional element of the curriculum. Even at the junior and senior student level, there would likely be those students and their parents who objected to such a course on religious grounds, as happens with more descriptive courses such as ones on comparative religion. Making such a course an elective requirement would obviate concerns by schools that students and their parents might claim it substantially burdened students' rights to the free exercise of religion as guaranteed by the Establishment's Clause First Amendment counterpart, the Free Exercise Clause. And if experience with an origins course counseled that it should become a required part of the curriculum, then schools could adopt a policy of allowing objecting students to be excused from attendance provided they appeared to have legitimate concerns about the free exercise of their religion. Set

<sup>358.</sup> Cf., e.g., NORD, supra note 4, at 348 (discussing teaching about religion in public schools and observing that "the complexity of religion and the potential for controversy require that students in Bible and religion classes possess a good deal of maturity. Such courses should be taught only in high schools.").

<sup>359.</sup> Cf., e.g., ACLU et. al., Joint Statement of Current Law on Religion in the Public Schools (1995) http://www.aclu.org/religion/schools/16146leg19950412.html (last visited Mar. 23, 2009) (focusing on the need to allow student choice in matters of religious conscience) (on file with the Washington and Lee Law Review).

<sup>360.</sup> U.S. CONST. amend. I.

<sup>361.</sup> Cf., e.g., ACLU et al., supra note 359 (noting the desirability of student opt-out provisions).

In terms of how the nature of an origins course is communicated to students, a school would want to be careful in the course description to emphasize its secular educational purpose of promoting an understanding of competing views on the subject in order to prepare students for the ongoing public debate on this fundamental issue, assisting students in making thoughtful decisions regarding their own worldviews, and promoting tolerance of differing views held by other members of society. In addition, the course description should be clear that the goal of the class is limited to teaching students about varying perspectives and discussing perceived strengths and weaknesses from a philosophical standpoint (i.e., in light of reason, human experience and empirical evidence), and not to suggest to students or persuade them that any one view or set of views should be preferred over another.

With respect to course materials, again the goal here would be to have as balanced and neutral a presentation of origins perspectives as practicable. In order to secure this goal, it would be best to establish in advance a relatively fixed set of topics and reading assignments for the course to diminish the risk of individual teachers who might, consciously or unconsciously, "weight" the course materials in favor of one position or another. Ideally this would take the form of a textbook that was developed by experts with training in philosophy (and particularly the philosophy of origins, or of the philosophy of science or religion in general), who were sensitized to the Establishment Clause issues at stake, and who could present the various arguments and concepts at the level of upper-level high school students. However, since this level of professionalism in preparing materials might not be achievable by school districts until there was a substantial market for such a text, in the beginning they might alternatively recruit the foregoing type of experts to assist them in developing an approved syllabus and reading list that teachers were obligated to follow in teaching an origins course.

Such course materials might begin by discussing the nature of science and religion, and how philosophical analysis can be used to discuss and consider views and beliefs on a subject like origins from the perspective of both traditions.<sup>363</sup> With respect to science, students should be led in particular to understand the nature and limits of the scientific endeavor (and especially its commitment to methodological naturalism) and what it takes for knowledge or theories to be considered "scientific." As to religion, students should, at a

<sup>362.</sup> Cf., e.g., CHARLES C. HAYNES ET AL., THE FIRST AMENDMENT IN SCHOOLS 37–38 (2003) (discussing issues to consider in structuring religious activities in public schools).

<sup>363.</sup> See supra Part III.C (discussing philosophic methods to evaluate both scientific and religious assertions).

<sup>364.</sup> See supra notes 180-207 and accompanying text (discussing the nature and limits of

minimum, understand its different approach to understanding the world, generally starting with a set of accepted beliefs based on revelation and other sources of religious knowledge.<sup>365</sup> And, finally, students might be led to understand how the discipline of philosophy can generally take propositions from both traditions and subject them to critical analysis based on tools of understanding utilized to a more or less degree by each of them: reason and logic, empirical evidence, and human experience (with science drawing more heavily on the former two tools and religion on the latter one).<sup>366</sup>

Beyond these introductory subjects, the materials would presumably consist of differing perspectives on the origin of the universe, life on Earth, and the human race, drawn from the dominant materialist and theistic schools of Western thought discussed earlier.<sup>367</sup> Again, the various arguments and counterarguments would have to be excerpted or described at a level suitable for understanding by upper-class high school students. Moreover, if a school thought that origins perspectives from other traditions, such as deism or pantheism, were desirable in order to be more inclusive or comprehensive in its coverage, there is no reason it could not include such perspectives so long as its selection process was governed by legitimate pedagogical criteria as opposed to religious or ideological considerations.<sup>368</sup>

Another major issue school officials would have to face in offering an origins course would be teacher training. Presumably most public high schools do not have on staff many teachers trained in philosophy, or even religion for that matter. But at its most basic level, and one likely suitable for teaching high school students, philosophy draws on common tools for understanding the world (reason, experience, evidence) and applies them in an organized and systematic manner to substantive questions. Teachers in particular are familiar with such ways of thinking, since they generally engage in similarly

the scientific endeavor).

<sup>365.</sup> See supra note 172 and accompanying text (describing religion as a personal or institutional set of beliefs in a supernatural being and reality).

<sup>366.</sup> See supra notes 276–82 and accompanying text (noting philosophy necessarily combines both approaches in the way it applies logic to the common human experience).

<sup>367.</sup> See supra notes 291-320 and accompanying text (discussing major theistic and materialist arguments regarding the existence or nonexistence of a divine creator).

<sup>368.</sup> Cf., e.g., Jay D. Wexler, Preparing for the Clothed Public Square: Teaching About Religion, Civic Education, and the Constitution, 43 Wm. & MARY L. REV. 1159, 1237-42 (2002) (discussing considerations for selecting which religions to teach about in a religious studies course).

<sup>369.</sup> See supra notes 276-82 and accompanying text (describing how philosophy can combine elements of both theology and science to address issues important to the common human experience).

structured thought when they plan and teach their classes. At its crudest level, philosophy essentially takes a proposition and asks "Does it make sense?" Accordingly, many teachers would likely have the raw skills necessary to explain differing origin perspectives and examine them in a critical, rational way, but what about the scientific or religious substance underlying them?

Certainly high schools have teachers trained in science, and often social studies or history teachers will have had some amount of education about various religions. And, of course, many teachers will have had some amount of education in their own religion of choice. The point is that high schools would not be starting from scratch in terms of formal training in various aspects of these subjects, and certainly many of the teachers will have thought about key origins issues as part of developing and adopting their own worldviews. Given this background, it is likely that many teachers could be prepared to teach an origins course with an achievable and realistic amount of training.

One common way school officials might go about making sure teachers were prepared to teach an origins course from both a methodological and substantive point of view would be to create a certification requirement for it. The certification could be achieved in a number of ways: through having certain majors or minors in college that exposed teachers to formal training in science, philosophy, and religion; through the creation of a college course on the philosophy of origins that teachers would need to successfully pass; or, by bringing in qualified experts to conduct workshops that teachers would need to take in order to pass some form of proficiency exam. The certification process should also have a requirement that a teacher of the course receive an adequate level of training in Establishment Clause law so that teachers were aware of the ground rules that they needed to observe when teaching an origins course.

<sup>370.</sup> Cf. generally SUSAN L. DOUGLASS, TEACHING ABOUT RELIGION IN NATIONAL AND STATE SOCIAL STUDIES STANDARDS 102–03 (2000), available at http://www.freedomforum.org/publications/first/teachingaboutreligion/teachingaboutreligionexecutivesummary.pdf (arguing that pre-service and in-service training for teachers of courses involving religious content are essential in order to ensure that they teach neutrally).

<sup>371.</sup> Cf. id. (describing a flexible approach that could involve undergraduate courses but also include in-service training on the job).

<sup>372.</sup> Cf. DOUGLASS, supra note 370, at 103 (observing that "[n]ecessary elements of inservice training include peer collaboration based on sharing areas of expertise, workshops in which teachers are exposed to content knowledge by specialists in the field, exposure to available resources and workshops on integrating skills and content in teaching about religions").

<sup>373.</sup> Cf., e.g., HAYNES ET AL., supra note 362, at 52 (describing the difference between teaching religion and teaching about religion).

One of the key ground rules should be that although a teacher would be expected to explain views and arguments presented in the approved reading materials and to lead students in discussing their perceived strengths and weaknesses based on reason, experience, and evidence, she should avoid reaching conclusions or offering her opinion on their apparent soundness from a rationality perspective. Although it is not clear that the Establishment Clause would legally require this—because advocating the sounder rationality of a particular argument in the context of a philosophical discussion is, as discussed earlier, different than advocating a particular religion as true based on a belief derived from faith or revelation (an issue that arises more in the context of teaching about religion)<sup>374</sup>—schools would likely want to adopt this rule as a prophylactic measure to guard against teachers, wittingly or not, transforming a philosophical discussion into one that, explicitly or implicitly, advocated the truth of a particular religious belief. In short, it would be best for teachers to remain neutral on the ultimate philosophical soundness of a particular view in order to avoid any appearances or realities of advocating it as truth as a result of its perceived rationality.

But what, one might ask, is a teacher to do if a student asks her about her opinion on the ultimate soundness of differing arguments and perspectives, or even about her religious (or non-religious) beliefs themselves and what led her to hold them? In such a case, the advice given by a noted guide to teaching about religion in the public schools is on point: The teacher may respond either that she prefers not to answer the question because it would be inappropriate to inject her own personal views into the discussion (explaining the necessity for maintaining an objective and balanced approach both for pedagogical and legal reasons), or, because upper class high school students would be mature and intelligent enough to distinguish personal opinions from official positions of the school, "the teacher may at most answer with a brief statement of personal belief—but may not turn the question into an opportunity to proselytize for or against religion."375 Another good suggestion the guide makes to avoid injecting a teacher's personal views into a course, which would also be appropriate to a philosophical setting, would be to require him or her to teach the subject by attribution (e.g., "Theists might argue that" or "Materialists or atheists might claim that"). 376

<sup>374.</sup> See supra notes 338-40 and accompanying text (distinguishing a theology course from a philosophy of religion course).

<sup>375.</sup> CHARLES C. HAYNES, A TEACHER'S GUIDE TO RELIGION IN THE PUBLIC SCHOOLS 7 (1999), available at http://www.freedomforum.org/publications/first/teachersguide/teachersguide.pdf.

<sup>376.</sup> Cf. id. at 3-4 ("Classroom discussions concerning religion must be conducted in an

Lastly, school officials would probably want to replicate a practice used in the area of teaching about religion to deal with potential constitutional problems in the philosophy of origins context as well. This practice is to establish a policy whereby student or parental complaints or concerns about a teacher abusing such a class to advocate her own religious beliefs or worldview could be confidentially reported and immediately investigated and resolved. If such abuse was found, the policy could provide for immediate substitution or removal of the teacher involved.<sup>377</sup>

By planning and implementing a philosophy of origins course in accordance with the suggestions outlined in this section, it is this author's belief that a public high school teacher could lead students in a robust and meaningful discussion of different perspectives on these important questions, all in accordance with applicable constitutional requirements.

## V. Conclusion

This Article has examined, and proposed a solution for resolving, two enduring and important problems in American public education. The first is the ongoing legal contests that occur, and will continue occurring in the absence of an acceptable alternative, regarding the teaching of evolutionary and other scientific theories in public schools that are perceived to conflict with religious perspectives on life. The second problem is intimately related to the first: The general tendency, through mistaken perceptions about the law or otherwise, for American public education to ignore the teaching of religious perspectives on life and thereby to relegate them to second class status in our society. This latter problem really comes home to roost when parents of students and others perceive that an imperfectly implemented but well-intentioned secular education agenda may be inadvertently pushing students towards accounts of our existence that may be antithetical to their fundamental beliefs and worldviews.

The solution proposed by this Article is to address these problems head on through the creation and implementation of a course, geared to upper-level high school students, that teaches and examines philosophically different accounts of

environment that is free of advocacy on the part of the teacher . . . . When discussing religion, many teachers guard against injecting personal religious beliefs by teaching through attribution.").

<sup>377.</sup> See Charles C. Haynes & Oliver Thomas, Finding Common Ground: A Guide to Religious Liberty in Public Schools 219 (2001) (describing a "Religious Practices Complaint Procedure" established by the Richardson Independent School District of Richardson, Texas that would be desirable to address any complaints of constitutional violation).

our existence and where we came from—drawn from both scientific and religious perspectives. Not only would such a course assist students with adopting informed and considered worldviews of their own, but it would ideally operate to relieve some of the pressure to conform science educational content to particular religious views of life. Moreover, it would also prepare our youths to understand and participate in the ongoing public debate on these fundamental issues and increase their tolerance and respect for the perspectives of others. In a pluralist democratic society where citizens must work and live together despite dramatic differences in their basic attitudes on life, any exercise that makes people realize that reasonable people can differ in good faith on such matters, and that we are all ultimately connected by our own searches for ultimate truth and meaning, can only be a positive thing.