

Reason and Common Ground: A Response to The Creationists' "Neutrality" Argument

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What science has to teach us is not its techniques but its spirit: the irresistible need to explore It has created the values of our intellectual life and, with the arts, has taught them to our civilization. Science has nothing to be ashamed of even in the ruins of Nagasaki. The shame is theirs who appeal to other values than the human imaginative values which science has evolved. The shame is ours if we do not make science part of our world, intellectually as much as physically, so that we may at last hold these halves of our world together by the same values.

—Jacob Bronowski¹

In my opinion, a recent article in the *Chapman Law Review*, addressing the controversy over teaching evolution and/or creationism in public school classrooms, fell beneath the acceptable standard of scholarly discourse.² The author, Stephen Trask, failed to address obvious objections to his thesis, cited virtually none of the scholarly literature on the subject³—even the literature that might *support* his thesis⁴—and found not a shred of support in the caselaw. This might be good reason simply to ignore the article, except that the argument Trask advanced appears to be growing in

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¹ J. BRONOWSKI, SCIENCE AND HUMAN VALUES 72–73 (rev. ed. 1965).

² Stephen W. Trask, *Evolution, Science And Ideology: Why the Establishment Clause Requires Neutrality in Science Classes*, 10 CHAP. L. REV. 359 (2006).

³ See, e.g., Matthew J. Brauer, et al., *Is It Science Yet?: Intelligent Design Creationism And The Constitution*, 83 WASH. U. L.Q. 1 (2005); Jay D. Wexler, *Darwin, Design, and Disestablishment: Teaching the Evolution Controversy in Public Schools*, 56 VAND. L. REV. 751 (2003); Colin McRoberts & Timothy Sandefur, *Piercing the Veil of Intelligent Design: Why Courts Should Beware Creationism's Secular Disguise*, 15 KAN. J.L. & PUB. POL'Y 15 (2005).

⁴ See, e.g., Francis J. Beckwith, *Public Education, Religious Establishment, And The Challenge of Intelligent Design*, 17 NOTRE DAME J.L. ETHICS & PUB. POL'Y 461, 469 (2003) (“exclud[ing] non-materialist . . . accounts of natural phenomena . . . is . . . at worst, intellectual imperialism.”); Andrew A. Cheng, *The Inherent Hostility of Secular Public Education Toward Religion: Why Parental Choice Best Serves the Core Values of the Religion Clauses*, 19 U. HAW. L. REV. 697, 716 (1997) (schools teaching religion and other matters are “[n]urturing of a [s]ecular [w]orld [v]iew.”).

popularity among creationists of all stripes.⁵ Moreover, hopes that creationism, or for that matter Postmodernism, would collapse under their own weight have so far not paid out.⁶ Sometimes it behooves us to make clear why balderdash is, indeed, balderdash.

First, we will begin with the obvious. Evolution by natural selection is a fact—a well-established, thoroughly documented, experimentally tested, observationally confirmed, real fact. Some contend that evolution need not conflict with religious belief, but for many others, it presents a real crisis.⁷ And, as might be expected of a person against whose position the evidence is so strong, Trask tries instead to question the validity of evidence, fact, and truth itself. Picking up on various Postmodernist themes, he begins with the proposition that science is simply one of many equally valid ways of knowing, and that our society's preference for those theories that have been established by evidence, experiment, and observation is simply a prejudice, reinforced by science's "hegemony," which "legitimizes the exclusion of those who do not understand truth exclusively through empirical verification."⁸ Science has no superior claim to truth;⁹ relying on it instead of faith is simply a matter of subjective preference.

Further, Trask argues, the Establishment Clause requires government to remain neutral, and to treat all "ways of knowing" as equal. Science's focus on natural causes rather than supernatural or magical causes,¹⁰ is itself a type of religion, and for government to endorse science, and particu-

⁵ See, e.g., Jana R. McCreary, *This Is The Trap The Courts Built: Dealing with The entanglement of Religion And The Origin of Life in American Public Schools*, 37 SW. U. L. REV. (forthcoming, 2007), available at <http://ssrn.com/abstract=979529>. McCreary's article came to my attention only while this article was in press, and time constraints preclude a thorough response to it. McCreary, however, commits many of the same fallacies as Trask, in many instances more egregiously so. Thus the present article will likely suffice. Like Trask, McCreary defines atheism and science as religions, because she uses the following as a definition of religion: "something people do together to face urgent problems." *Id.* at 5. A vaguer definition could hardly be devised. By this definition, everything from Sufism to membership in a political party to buying an umbrella in a rainstorm would qualify as religion! See *id.* at 59 (defining "dogma" as "some sort of belief held" by either a religious or any kind of organization "that is authoritative and that is to be neither disputed nor doubted," a definition which would apply, e.g., to belief that the earth exists). Such wordplay allows McCreary to categorize science as a religion and then to argue, as Trask does, that the Establishment Clause forbids the teaching of science in public schools. *Id.*

⁶ One excellent discussion of these matters is Suzanna Sherry, *The Sleep of Reason*, 84 GEO. L. J. 453 (1996).

⁷ Trask is a creationist. Stephen W. Trask, A Loving Designer, AgapeRevolution.com, <http://agaperevolution.com/2006/03/22/bishop-of-canterbury-opposes-evolution-in-science-classes/> (March 22, 2006) ("the theory of evolution is theologically inconsistent with the Christian view of God. One of the most important elements of the Genesis creation account is not just that it records how the world was created, it is that God created the world through very specific means that reveals to us what kind of God he is. . . . Although, God could have brought the world into being through a very slow evolutionary process, it would really have been a wimpy God's method of accomplishing the creation of the world."). He believes that the Supreme Court should overturn *Edwards v. Aguillard*, and allow the teaching of "alternatives to evolution science, such as creation science" in government schools." Trask, *supra* note 2 at 368, 390.

⁸ Trask, *supra* note 2, at 362–63.

⁹ *Id.* at 364.

¹⁰ I use the terms "supernatural," "magical," and "religious," interchangeably.

larly of evolution—by teaching it in schools—is “forcibly indoctrinating students into the religion of secular humanism”¹¹ and compelling them to undergo “religious instruction.”¹² Government instead ought to remain “neutral” by teaching “alternative theories” to evolution in science classes, including explicitly “supernatural” ones.

This argument is troubling for many reasons. I will begin with the epistemological claim—that science is simply one among many different but equal paths to knowledge and that its ascendancy over other methods is due to conflicts between social power structures rather than any objective superiority. I will also consider the related arguments that science’s exclusive reliance on natural causes—so called “methodological naturalism”—is an *a priori* assumption, and that science or secularism is a “religion” which falls under the Establishment and Free Exercise Clauses of the First Amendment. In Part II, I will address whether the First Amendment requires the government to remain “neutral” between supernatural and naturalistic worldviews. I will conclude with some observations on the conflict between science and supernaturalism in general.

I. SCIENCE AS A WAY OF KNOWING

A. Competing Epistemologies

The scientific method is a tool of unmatched efficacy. The practical benefits of science are incalculably vast. While its fruits include such modern horrors as atomic weapons, it has also cured diseases, improved crop yields beyond the wildest dreams of former generations, harnessed energy on an unimaginable scale, and provided us with modern conveniences that have become such a part of our lives that we generally take them for granted. Modern medical devices, automobiles and airplanes, telecommunications and computing, refrigeration and farming methods, weather satellites, nuclear attack submarines, comfortable shoes and plastic bags that keep salads fresh for weeks,¹³ all owe their existence to the scientific focus on controlling nature by understanding and obeying her.¹⁴ In 1900, life expectancy in the United States was 47.3 years. Today it is 77.8 years.¹⁵ Since 1900, infant mortality in the United States has decreased 90

¹¹ Trask, *supra* note 2, at 365.

¹² *Id.* at 390.

¹³ Recent years have seen the invention of the ready-to-eat salad pack, a remarkable piece of ingenuity that owes its existence to specially designed polymer bags and a technique called “Modified Atmosphere Packaging.” See B.P.F. Day, *Perspective of Modified Atmosphere Packaging in Western Europe*, 4 FOOD SCI. & TECH. TODAY 221 (1990).

¹⁴ Francis Bacon’s statement that “Nature to be commanded must be obeyed; and that which in contemplation is as the cause is in operation as the rule” is among the profound thoughts that make Bacon one of the founding fathers of the scientific revolution. FRANCIS BACON, *Novum Organum* in 8 THE WORKS OF FRANCIS BACON 59, 68 (James Spedding, *et al.*, eds., Taggard and Thompson, 1863).

¹⁵ NATIONAL CENTER FOR HEALTH STATISTICS, HEALTH UNITED STATES, 2006 WITH CHARTBOOK ON TRENDS IN THE HEALTH OF AMERICANS 176 tbl.27 (2006) available at <http://www.cdc.gov/nchs/data/has/has06.pdf#027>.

percent, and maternal mortality has decreased 99 percent.¹⁶ In 1900, the average worker labored 56 minutes to earn enough money to buy a half-gallon of milk. Today, it's less than 7 minutes. In 1910, it took the average worker two hours and forty minutes of labor to afford a three-pound chicken; today, it takes the same worker 14 minutes.¹⁷ Expensive food and high infant mortality rates were, until the Scientific and Industrial Revolutions, simply facts of life.¹⁸

Naming the practical benefits of science fails to get at the heart of the issue because science is not just its practical benefits. Obviously, one of science's great goals is to make such practical improvements; to provide, in Francis Bacon's famous words, for "the relief of man's estate."¹⁹ But science is more than a collection of findings; it is a way of getting at the underlying structure of our world, and while it has proven its effectiveness in practical results, focusing only on its material benefits, and not the process, would lead to the problem made familiar in the old adage that if you give a man a fish he will eat for a day, but if you teach him to fish, he will eat for a lifetime. Humanitarian efforts to bring the fruits of scientific research to the Third World may alleviate the poverty in which too many still live, but it is only by teaching others how to think scientifically, and giving them the intellectual tools they need to make future discoveries on their own, that human suffering and ignorance can be reduced.

The scientific method requires observation of natural phenomena, the formation of hypotheses about their nature, the testing of those hypotheses through experiment, and the evaluation of the hypotheses in light of the experimental results.²⁰ Science seeks "elegant" explanations which will account for the observed phenomena without unnecessary complications, and it seeks general laws that will explain phenomena in terms of simpler phenomena. In this way, it builds what Richard Feynman called a "hierarchy of ideas," which tries to begin with "the fundamental laws of physics," and lead "up in this hierarchy of complexity" towards "words and concepts like 'man,' and 'history,' or 'political expediency,' and so forth."²¹ This step-by-step understanding is built by forming "invisible-hand explanations" which will seek to describe the explanandum in terms other than that which

¹⁶ Center for Disease Control, *Ten Great Public Health Achievements—United States 1900–1999*, 48 MORBIDITY AND MORTALITY WEEKLY REPORT (MMWR) 242 (1999) available at <http://www.cdc.gov/mmwr/PDF/wk/mm4812.pdf>.

¹⁷ W. MICHAEL COX AND RICHARD ALM, MYTHS OF RICH AND POOR: WHY WE'RE BETTER OFF THAN WE THINK 43 tbl.2.2 (1999).

¹⁸ Scientific and technological advancement are only among the more important of many factors that have improved the standard of living. See generally NATHAN ROSENBERG AND L.E. BIRDZELL JR., HOW THE WEST GREW RICH: THE ECONOMIC TRANSFORMATION OF THE INDUSTRIAL WORLD (Basic Books 1985).

¹⁹ FRANCIS BACON, *The Advancement of Learning*, in 3 THE WORKS OF FRANCIS BACON 255, 294 (James Spedding, et. al. eds., Longman & Co. 1857).

²⁰ See NATIONAL ACADEMY OF SCIENCES, TEACHING ABOUT EVOLUTION AND THE NATURE OF SCIENCE ch. 3, available at <http://books.nap.edu/html/evolution98/evol3.html> (last visited Oct. 3, 2007).

²¹ RICHARD FEYNMAN, THE CHARACTER OF PHYSICAL LAW 118–19 (Random House 1994).

is being explained—just as a dictionary will avoid using a word in its own definition.²² The ultimate goal is a unified and empirically sound understanding of the world.

This understanding of the scientific enterprise flies in the face of the Postmodernist theories underlying Trask's thesis. According to Postmodernism, there is no reality to be understood, or, if there is, it cannot be understood in an objective sense. Instead, what we think of as understanding is really the construction of "narratives"—socially created worldviews which we adopt as "true," but whose truth value runs no deeper than the language in which they are expressed. Man cannot really connect to nature; he is separated from reality by a kind of invisible and impenetrable bubble of language. And these narratives, or paradigms, are tools or weapons that are manipulated in a struggle for power between populations. The "truth" these narratives allegedly describe is really a trick for controlling people and obtaining resources for the privileged elites who are most responsible for constructing and maintaining our social structures.

If nothing else,²³ Postmodernism represents a direct attack on the Enlightenment legacy, and particularly on science.²⁴ The entire idea of formulating a unified, reliable, objectively true description of the nature of the universe clashes with the postmodern vision that there are different "ways of knowing" that are equally valid—women's ways of knowing, Eastern ways of knowing, and so forth.²⁵ Science's dream of discovering laws that can be understood by all humanity regardless of their various cultures is therefore doomed. "If, as postmodernists would have it, meaning and truth are inexorably bound to context and historical setting, then the whole point of scientific theorizing would vanish, and science itself would have to be abandoned."²⁶

Postmodernist theories appear to be growing in popularity among creationists, and particularly those of the Intelligent Design variety.²⁷ Phillip

²² See ROBERT NOZICK, *ANARCHY, STATE AND UTOPIA* 18–19 (1974) (describing "invisible hand" and "fundamental" explanations.).

²³ There is good reason to believe there is nothing else. See generally Dennis W. Arrow, *Spaceball (Or, Not Everything That's Left is Postmodern)*, 54 VAND. L. REV. 2381 (2001); Dennis W. Arrow, "Rich," "Textured," and "Nuanced": Constitutional "Scholarship" and Constitutional Messianism at the Millennium, 78 TEX. L. REV. 149 (1999); Dennis W. Arrow, *Pomobabble: Postmodern Newspeak and Constitutional "Meaning" for the Uninitiated*, 96 MICH. L. REV. 461 (1997).

²⁴ See ALAN D. SOKAL AND JEAN BRICMONT, *FASHIONABLE NONSENSE: POSTMODERN INTELLECTUALS' ABUSE OF SCIENCE* (Picador USA 1998).

²⁵ There is an eerie similarity here to the Nazi claim that "Jewish science" was somehow distinct from *Deutsche physik*. WILLIAM L. SHIRER, *THE RISE AND FALL OF THE THIRD REICH* 250 (New York: Touchstone, 1981) (1960).

²⁶ Loren Fishman, *Feelings And Beliefs*, in *THE FLIGHT FROM SCIENCE AND REASON* 87, 95 (Paul. R. Gross et al. eds., 1996).

²⁷ See Noam Scheiber, *Science Fiction*, NEW REPUBLIC, Sept. 5, 2005 at 6 ("postmodernist ideas have become a staple of the ID movement."); Stanley Fish, *Academic Cross Dressing: How Intelligent Design gets its arguments from the left*, HARPER'S, Dec. 2005 at 70–72; Posting of Nick Matzke to Panda's Thumb, *ID = Postmodern Creationism*, http://www.pandasthumb.org/archives/2005/08/id_postmodern_c.html (Aug. 4, 2005, 11:26 PM).

Johnson, whose books attacking evolution are a cornerstone of the ID movement, has declared his allegiance to Postmodern notions such as deconstructivism.²⁸ Francis Beckwith, probably the most prominent defender of creationism in the legal academy, argues in many of his articles that science's methodological naturalism is no more or less valid than the embrace of supernaturalism among religious believers and that granting science any greater prestige is "intellectual imperialism."²⁹ David DeWolf and other writers affiliated with the pro-ID Discovery Institute contend that scientists have "wielded demarcation arguments as a way of protecting the Darwinist hegemony in public education," and portray the scientific community's opposition to the teaching of creationism as based in power, rather than in evidence.³⁰

But Postmodernism is ultimately an empty philosophy³¹—if it is a

28 See ROBERT T. PENNOCK, *TOWER OF BABEL: THE EVIDENCE AGAINST THE NEW CREATIONISM* 210 (1999) (quoting Johnson: "After a morning of writing I met Political Science professor Patricia Boling who hosted a noon colloquium for the department faculty and grad students. I told them I was postmodernist and deconstructionist just like them, but aiming at a slightly different target."). Johnson, however, has elsewhere claimed that he is not a Postmodernist. Scheiber, *supra* note 27 at 71 (quoting Johnson: "I'm no postmodernist."). See also MICHAEL RUSE, *MYSTERY OF MYSTERIES: IS EVOLUTION A SOCIAL CONSTRUCTION?* (1999).

29 Beckwith, *supra* note 4, at 469.

30 David K. DeWolf, et al., *Teaching The Origins Controversy: Science, Or Religion, Or Speech?* 2000 UTAH L. REV. 39, 73–74 (2000).

31 The factual, not to say ethical, weakness of Postmodernist relativism has long led Christians to distance themselves from it. After all, Christianity, like other religions, is based on the notion that there is, indeed, one God at least—or at most, see *Exodus* 20:2–3 (King James) ("I am the LORD thy God . . . Thou shalt have no other gods before me")—that both He and the world around us are real and that God placed people in it and has manipulated it as an objective fact. Those who deny these truth-claims are not simply people with different narratives; according to Christianity as to many other faiths, those who deny the objective, factual nature of God's existence, the story of Jesus, and other truth-claims are alleged to be *wrong*. See, e.g., *John* 14:6 (King James) ("Jesus saith unto him, I am the way, the truth, and the life: no man cometh unto the Father, but by me."); *2 Timothy* 2:12–13 (King James) ("If we suffer, we shall also reign with him: if we deny him, he also will deny us: If we believe not, yet he abideth faithful: he cannot deny himself."); *2 Peter* 2:1 (King James) ("But there were false prophets also among the people, even as there shall be false teachers among you, who privily shall bring in damnable heresies, even denying the Lord that bought them, and bring upon themselves swift destruction."). See also *Sura* 6:5 (THE KORAN) (N.J. Dawood, trans., London: Penguin Classics 1999 at 93) ("He is God in the heavens on earth. . . . Yet every time a revelation comes to them from their Lord, they pay no heed to it. Thus do they deny the truth when it is declared to them: but they shall learn the consequences of their scorn.").

It is ironic indeed to find Trask defending creationism on Postmodern grounds, given that Christians (and members of other religious groups) have long been concerned about the extreme moral and cultural relativism that lies at the heart of Postmodernism. Indeed, some Christian philosophers have argued that the Intelligent Design version of creationism is an effective way to avoid the relativistic doctrines of Postmodernism. See, e.g., J.P. Moreland, *Postmodernism And The Intelligent Design Movement*, 1 PHILOSOPHIA CHRISTI 97, 101 (1999) (arguing that Intelligent Design creationism will provide Christians with "the rudder necessary to media [sic] between the Scylla of scientific naturalism and the Charybdis of post modernism.") Postmodernism—largely sponsored by thinkers who seek to avoid the often violent clashes between cultures and societies that differ on fundamentals—seeks to defuse conflicts by denying their reality. But this is as contrary to Christian teaching as it is to secular ones. Simply put, Christianity is incompatible with Postmodernism. See, e.g., *Matthew* 10:33–34 (King James) ("whosoever shall deny me before men, him will I also deny before my Father which is in heaven. Think not that I am come to send peace on earth: I came not to send peace, but a sword."); *Revelation* 3:16 (King James) ("So then because thou art lukewarm, and neither cold nor hot, I will spue thee out of my mouth."). See also THE DEATH OF TRUTH: RESPONDING TO MULTICULTURALISM, THE

philosophy at all. For all its fashionable jargon, Postmodernism cannot undo the fact that reality is reality, and that in understanding the world around us, we run up against objectively true facts that simply cannot be denied.³² Postmodernism is a kind of solipsism, impossible for any but the suicidal to take seriously. As Richard Dawkins has eloquently put it, there are no postmodernists at 30,000 feet: "Airplanes built according to scientific principles work. They stay aloft, and they get you to a chosen destination. Airplanes built to tribal or mythological specifications, such as the dummy planes of the cargo cults in jungle clearings, or the beeswaxed wings of Icarus, don't."³³ No amount of linguistic disputation will change this basic, empirically verifiable fact.

What makes science such a special enterprise is that its commitment to objectivity allows it to be universal. People of widely different backgrounds can run the same experiments and see the same results. Whether they are of different races, different political views, or even if they disagree strongly on scientific matters, science enables them to communicate their ideas and to put their disagreements to the test. The history of science is rich with stories of those whose severe disagreements were put to the test, and in which those proven wrong have peacefully and even cheerfully admitted their errors and moved on to learn more.³⁴ This is because the scientific method allows for the testing of theories before an objective standard—precisely what Postmodernism claims is impossible. Where the Postmodernist envisions minds as locked within their cultural bubbles, unable to touch nature, and unable to communicate entirely with one another, science envisions minds as basically free, able to learn, and to share with and convince others. As Thomas Huxley famously put it, science is simply

REJECTION OF REASON AND THE NEW POSTMODERN DIVERSITY (Dennis McCallum ed., 1996).

³² Daniel C. Dennett, *Postmodernism And Truth*, (Aug. 13, 1998) (unpublished paper delivered at the World Congress of Philosophy), available at <http://ase.tufts.edu/cogstud/papers/postmod.tru.htm>. ("[There] are truths about events that really happened. Their denials are falsehoods. No sane philosopher has ever thought otherwise, though in the heat of battle, they have sometimes made claims that could be so interpreted. . . . In short, the goal of truth goes without saying in every human culture."). See also, *THE SOKAL HOAX: THE SHAM THAT SHOOK THE ACADEMY* (Lingua Franca eds., 2000) (dramatizing Postmodernism's failings through publication of a hoax paper claiming on Postmodernist methods to prove that gravity is a myth).

³³ RICHARD DAWKINS, *RIVER OUT OF EDEN: A DARWINIAN VIEW OF LIFE* 31–32 (1995). But see Matt Egan, *Nepal Airline Sacrifices Two Goats to Sky God in Face of Aircraft Problems*, FOX NEWS, Sept. 5, 2007, <http://www.foxnews.com/story/0,2933,295857,00.html> (airline ground crew having technical trouble with a Boeing 757 sacrificed goats to appease the Hindu sky god Akash Bhairab).

³⁴ KARL POPPER, *CONJECTURES AND REFUTATIONS: THE GROWTH OF SCIENTIFIC KNOWLEDGE* 293 (Routledge Classics, 2006) (1963) ("The history of science, like the history of all human ideas, is a history of irresponsible dreams, of obstinacy, and of error. But science is one of the very few human activities—perhaps the only one—in which the errors are systematically criticized and fairly often, in time, corrected.") But religion, like taste, is amenable to no test in reality and no objective verification. Religious differences cannot be brought to a standard tribunal and settled through experiment. Science requires that differences be settled through persuasion. Religion does not. The history of religious violence attests to the consequences of that difference. See, e.g., JON KRAKAUER, *UNDER THE BANNER OF HEAVEN: A STORY OF VIOLENT FAITH* (2003); Sherry, *supra* note 6 at 477–82 (explaining that the use of power is the only alternative when reasoned discourse is abandoned, whether by Postmodernism, religion, or other doctrines).

organized common sense:

Common sense is science exactly in so far as it fulfils [sic] the ideal of common sense; that is, sees facts as they are, or, at any rate, without the distortion of prejudice, and reasons from them in accordance with the dictates of sound judgment. And science is simply common sense at its best; that is, rigidly accurate in observation, and merciless to fallacy in logic.

Whoso will question the validity of the conclusions of sound science, must be prepared to carry his scepticism [sic] a long way; for it may be safely affirmed, that there is hardly any of those decisions of common sense on which men stake their all in their practical life, which can justify itself so thoroughly on common sense principles, as the broad truths of science can be justified.³⁵

Postmodernism, it is clear, takes skepticism a very long way—much too far for humanity. To subscribe to it one must concede that the everyday facts of reality are merely “language games,”³⁶ and that there is no objectively verifiable reality about the facts which every living person in actual practice does take as real. One is reminded of the famous story of Dr. Johnson, who, asked his opinion about Berkeley’s radical subjectivism, kicked his foot against a stone and cried, “I refute it thus!”³⁷

“Naturalistic” science is more than simply another “possible approach[]” to understanding.³⁸ Contrary to the claims of its Postmodernist critics, science is a robust and universal system with a code of values which we would all do well to emulate. The society of scientists is a diverse, lively, dynamic and peaceful one, united by a search for objectively ascertainable fact.³⁹

B. Avoiding Supernaturalism

One increasingly common critique is that science’s exclusive focus on natural forces—its so-called “methodological naturalism”—is *a priori*: that is, an assumption made at the beginning of the process; an assumption which cannot be justified and which unfairly stacks the deck against the supernatural.⁴⁰ The resolution only to look for natural—not supernatural—

³⁵ THOMAS HENRY HUXLEY, *THE CRAYFISH: AN INTRODUCTION TO THE STUDY OF ZOOLOGY* 2 (1880). Obviously science has come to some conclusions that diverge *wildly* from common sense—quantum physics, for example—but these conclusions are just the result of *very, very*, organized common sense!

³⁶ Trask, *supra* note 2, at 362.

³⁷ JOHN HOSPERS, *AN INTRODUCTION TO PHILOSOPHICAL ANALYSIS* 80 (4th ed. 1997).

³⁸ Trask, *supra* note 2, at 364.

³⁹ See generally BRONOWSKI, *SCIENCE AND HUMAN VALUES*, *supra* note 1, at 49–76.

⁴⁰ See, e.g., Francis J. Beckwith, *Science And Religion Twenty Years after McLean v. Arkansas: Evolution, Public Education, And The New Challenge of Intelligent Design*, 26 HARV. J.L. & PUB. POL’Y 455, 457 (2003) (referring to “an *a priori* philosophical commitment to methodological naturalism” allegedly shared by scientists.); Book Note, *Not your Daddy’s Fundamentalism: Intelligent Design in the Classroom*, 117 HARV. L. REV. 964, 966 (2004) (reviewing FRANCIS J. BECKWITH, *LAW, DARWINISM, AND PUBLIC EDUCATION: THE ESTABLISHMENT CLAUSE AND THE CHALLENGE OF INTELLIGENT DESIGN* (2003)) (referring to “an *a priori* philosophical commitment to [methodological naturalism]” within “evolutionary theory.”) But see Posting of Brian Leiter to Leiter Reports: A Philosophy Blog, http://leiterreports.typepad.com/blog/2005/10/a_priori_in_the.html (Oct. 3, 2005 08:54).

causes is simply the prejudice of resolutely closed minds. This argument is helpful to Trask and others who share his view,⁴¹ because it helps portray science and religion as simply alternative viewpoints which deserve equal treatment under the Constitution's religion clauses.⁴² But this is false. Scientists have at least three very good reasons for avoiding supernatural causation in their research.

First, and most obviously, science focuses on natural causes instead of supernatural ones because by now, experience has demonstrated that this is an extremely effective way of doing things. Generations of scientists have made enormous progress on some of humanity's greatest mysteries, and they have done so by seeking out natural causes and putting aside speculations about the supernatural. This, it must be noted, means that methodological naturalism is *not a priori*, but *a posteriori*. Science relies on natural causation because we have discovered that doing so works very well.⁴³

Second, science seeks natural causes instead of supernatural ones because supernatural agencies are, by definition, not amenable to scientific inquiry. A supernatural entity—one that operates outside of the course of nature, and is not measurable, predictable, or manipulable—cannot be studied by science anyway. It is reasonable for scientists to confine their efforts to subjects that they can study. There is no sense in reaching for something that is outside of our reach, and a realm of the supernatural is simply not something that can be understood in the terms that science uses. For scientists to focus their attention on natural causes is therefore perfectly legitimate.⁴⁴

Finally, forming a "hierarchy of knowledge" requires scientists to avoid dropping some inexplicable trick into the chain of knowledge—some

EST) (explaining why methodological naturalism is not *a priori*).

⁴¹ See, e.g., Francis J. Beckwith, *Rawls's Dangerous Idea?: Liberalism, Evolution And The Legal Requirement of Religious Neutrality in Public Schools*, 20 J.L. & RELIGION 423 (2004–2005).

⁴² Brauer, *et al.*, *supra* note 3 at 46 ("accus[ing] evolutionary scientists of an a priori commitment to [methodological naturalism is an attempt] . . . [T]o convince supporters and potential recruits that science's naturalism is arbitrary, lacking foundation in the pragmatic necessities of scientific explanation. This makes scientists appear dogmatic and conspiratorial, concerned only to keep creationists' putatively competitive explanation of 'origins' from assuming its rightful scientific status. This approach appeals to Americans' desire that each side of an issue be heard.").

⁴³ *Id.* at 48–49 (science "requires no a priori *metaphysical* commitments. The only commitment is to an empirical methodology, which scientists use with good reason: it works. Natural explanations are scientifically successful; supernatural ones are not.").

⁴⁴ See Barbara Forrest, *Methodological Naturalism and Philosophical Naturalism: Clarifying the Connection*, 3 PHIL 7 (2000). Obviously, if another "reality" did exist, which *could* be measured, predicted, and evaluated, and which had effects on this world, it would then be a legitimate subject of study by scientists. But then, it would cease to be supernatural or otherworldly! For example, scientists have studied the alleged healing effects of prayer, but their study has been confined only to the (purported) natural effects, not to the prayer itself or the Godhead. See, e.g., Jennifer M. Aviles, *et al.*, *Intercessory Prayer And Cardiovascular Disease Progression in A Coronary Care Unit Population: A Randomized Controlled Trial*, 76 MAYO CLINIC PROC. 1192 (2001) (finding no significant effect). Even if such studies demonstrated a significant effect, it would prove only the existence of an interesting *natural* phenomenon, which would then be subsumed under science—but it would prove nothing about a supernatural cause of such a phenomenon.

special “X”-factor which will pretend to connect two halves of a theory together but which ultimately leaves the mystery unsolved. Daniel Dennett refers to such tricks as “skyhooks,” because they hang from nothing, holding up a theory without having to touch the ground, as it were.⁴⁵ A skyhook aims to provide an exception to the mechanistic, natural processes that connect real phenomena to one another. It provides a magical spark, or *deus ex machina*, in a system that otherwise would be the simple working of mindless forces on mindless entities. Science avoids skyhooks because skyhooks do no explanatory work, and they tend to swallow up the explanatory power of those theories that *are* well established.

For example, if a person wants to know how genes control the development of an animal, a scientist would explain how the molecules of DNA and RNA work—how a gene is transcribed by the ribosome into a protein, which then sets in order cellular processes, which in turn control the metabolism and make up the structures of tissues Eventually, such an invisible hand explanation can connect the most sophisticated processes to the most fundamental ideas that science now understands. But tell a person “it’s magic,” and nothing is accomplished: no explanation is provided at all. Magic is an intellectual dead-end, a wall against which questions simply bounce back. If a person asks, “How does magic work?” or “Why does magic have this result instead of a different result?” the answer is simply, because that’s just what magic does. There just *is* no deeper answer.⁴⁶ But if magic is an end to the inquiry, why not also use it to “explain” everything else? The formation and functions of the body work because of the (awesomely complicated) mechanical functions of the proteins and amino acids—or it’s just magic, and trying to understand magic is, of course, pointless. After all, it’s magic, not boring old comprehensible science! Magical “explanations” do just as much work for every phenomenon to which they are applied, no matter how complicated—that is to say, none at all. They merely substitute words in place of an explanation. Like “because I said so,” the statement “it’s just magic” is fundamentally *arbitrary* because it can with equal plausibility apply to any possible state of affairs.

This point is especially relevant to the evolution controversy. The philosopher of science Jacob Bronowski put the point well when asked whether evolution didn’t just implausibly suppose that everything came

⁴⁵ DANIEL C. DENNETT, *DARWIN’S DANGEROUS IDEA: EVOLUTION AND THE MEANINGS OF LIFE* 74–77 (1995).

⁴⁶ This seems to me to be the lesson of the Book of Job, wherein the abused Job finally asks for some explanation for his sufferings and is rebuked for daring to question. Job then repents. *Job* 38:2–42:6. Cf. Sherry, *supra* note 6 at 476 (“Because God’s commands need not be rational, logical, or consistent, . . . [reference to] God’s will is essentially a conversation stopper If one does not share the underlying faith, one is reduced to arguing about whether the believer has properly interpreted God’s commands. That is a sterile argument indeed—focusing on authority rather than morality—and one which is particularly unlikely to succeed in the context of any religion that denies individual believers the right to dissent from authorized interpretations.”) There is obviously a big difference between saying that there is no answer and saying that one does not (yet) *know* the answer, but that it is out there for the finding. Science does the latter all the time.

about by mere accident:

On the contrary, it is those who appeal to God and special creation who reduce everything to an accident. They assign to man a unique status on the ground that there was some act of special creation which made the world the way it is. But that explains nothing, because it would explain anything: it is an explanation for *any* conceivable world. If we had the color vision of the bee combined with the neck of the giraffe and the feet of the elephant, that would equally be explained by the “theory” of special creation.⁴⁷

Magical “explanations” therefore teach nothing—yet consider Trask’s statement that “exclusion of supernatural theories from science classes marginalizes religious belief.”⁴⁸ If the implication here is that supernatural “theories” ought to be included in science lessons, one can only imagine what science classes would be like. In addition to thoroughly documented, well-substantiated scientific propositions, teachers would be compelled to list—non-judgmentally—the many varieties of (often conflicting) supernatural propositions from every religion, major and minor, each of which lacks evidentiary support or even the potential for such support. If the teacher explains that earthquakes are caused by the motions of the Earth’s tectonic plates, he would then be required to explain that there are equally legitimate notions that they are caused by Poseidon becoming angry at the moral transgressions of sailors,⁴⁹ or the laughter of the Egyptian god Geb,⁵⁰ and that no mere empirical evidence for or against these propositions is available or possible, because these are just different ways of knowing, and it’s up to the children to decide what to believe. In the end, science avoids these “supernatural explanations”⁵¹ because there simply are no such things: appeals to the supernatural are not explanations at all.

C. Is Science A Religion?

Another essential point for Trask is the argument that science is part of a “religion” of “secular humanism” which has gained unfair advantages with the public, and particularly in classrooms. This “religion,” Trask claims, “emerge[s] logically and necessarily from the materialist scientific method.”⁵² Teaching science, therefore, and particularly evolution, is a form of “forcibl[e] indoctrinat[ion]” in the religion of secular humanism.⁵³

⁴⁷ George Derfer, *Science, Poetry and “Human Specificity”: An Interview with J. Bronowski*, 43 AM. SCHOLAR 386, 399–400 (1974). See also CARL ZIMMER, *EVOLUTION: THE TRIUMPH OF AN IDEA* 332 (2002) (quoting Richard Dawkins: “If you’re allowed just to postulate something complicated enough to design a universe intelligently. . . . [y]ou’ve simply allowed yourself to assume the existence of exactly the thing which we’re trying to explain . . . You’re simply not providing any kind of explanation at all.”).

⁴⁸ Trask, *supra* note 2, at 382.

⁴⁹ HOMER, *ODYSSEY reprinted in CLASSICAL MYTHOLOGY: IMAGES & INSIGHTS* 469, 470–71 (Stephen L. Harris & Gloria Platzner eds., Stanley Lombardo trans., McGraw-Hill, 4th ed. 1995).

⁵⁰ GEORGE HART, *THE ROUTLEDGE DICTIONARY OF EGYPTIAN GODS AND GODDESSES* 59 (2d ed. 2005).

⁵¹ Trask, *supra* note 2, at 364.

⁵² *Id.* at 365–66.

⁵³ *Id.* at 365.

To begin with, this claim commits the fallacy of affirming the consequent. Assuming it is true that secular humanism is a religion, and that evolution or other scientific theories are a part of that religion, it still would not follow that teaching these scientific theories would constitute forbidden indoctrination. Many true claims—*e.g.*, that Augustus was once Emperor of Rome⁵⁴—are subsumed under religious doctrines, but they are not therefore religious claims.

More to the point, Trask contends that science “requires as much faith as belief in the supernatural.”⁵⁵ He bases this claim on the assertions that for science to legitimize itself would be circular reasoning, because the precepts to which such a justification would appeal are themselves the constructs of secular, scientific society,⁵⁶ and also that “science cannot prove through the senses alone that all true knowledge must be directly accessible to the senses,” since trying to do so would beg the question.⁵⁷

The latter charge can be dealt with quickly: scientists do not claim that all true knowledge must be accessible through the senses, but merely that *scientific* knowledge must be accessible through the senses. Nor does science claim that all true knowledge can be understood through the scientific method; it claims merely that all *scientific understanding* must be based on empirical evidence and processed by reason. Realist philosophers do hold that all valid knowledge must be in some way reducible to sense experience, but they do not hold that *all* knowledge must *directly* accessible to the senses. Mathematics, for example, is not directly accessible to the senses. But for such knowledge to be of any use to humans, it must be demonstrable in a way that can be confirmed by some sort of sensory experience, if for no other reason than that it can then be taught to others.

A more complicated issue is the oft-heard claim that all knowledge has a foundation in faith because, although we may establish thorough, logically sound constructs, our basic assumptions must always be mere assumptions: for example, sophisticated chains of reasoning still make the “leap of faith” that sensory data are reliable. This argument is wrong, since it confuses assumptions with axioms. Axiomatic knowledge is *not* taken on faith, or merely assumed; rather, axioms are propositions that contain their own proof and cannot be denied without being simultaneously relied upon.⁵⁸ Science establishes its propositions by experimental confirmation

⁵⁴ But not at the time when Cyrenus ruled Syria and Herod I ruled Judea. Compare Luke 1:5, 2:1–2 (asserting that Augustus, Cyrenus, and Herod I ruled at the same time) with ROBIN LANE FOX, THE UNAUTHORIZED VERSION: TRUTH AND FICTION IN THE BIBLE 28 (1991) (noting that Cyrenus (Quirinus) was not governor of Syria until a decade or so after the death of Herod.).

⁵⁵ Trask, *supra* note 2, at 363.

⁵⁶ *Id.* In other words, scientists defending their work on the grounds that their discoveries are supported by the evidence are just begging the question because the value of evidence is merely one of science’s assumptions! “Tantum religio potuit suadere malorum.” LUCRETIUS, DE RERUM NATURA 1:101 (W. H. D. Rouse trans., 3d ed. rev. 1966).

⁵⁷ Trask, *supra* note 2, at 363.

⁵⁸ See generally ARISTOTLE, *Metaphysics* bk IV ch. 3–4, in, THE BASIC WORKS OF ARISTOTLE 735–43 (Richard McKeon, ed., Random House, 1941); Tibor Machan, *Evidence of Necessary Exis-*

using perceptual data⁵⁹ which are themselves the irreducible, non-arbitrary foundation of cognition.⁶⁰ A similarly common contention is that science must assume—with apparent arbitrariness—the validity of induction: a scientist is merely guessing that because the sun has risen countless times, it will rise again in the morning. This is really just an assumption, not a logical necessity, so the chain of reason is said to collapse here. This too, is incorrect. Induction is a process of grasping the similarities and differences in causal relationships and forming a complete conceptual understanding.⁶¹ Moreover, the whole point of the experimental method, as opposed to mere contemplation, is that it has a healthy relationship with inductive reasoning, since experimentation alone allows us to test the veracity of our inferences. Since inference is typical in human thinking, science provides us with a uniquely effective way to weed out bad induction from good: formulation of hypotheses, testing with empirically verifiable results, and then refinement or rejection of invalid inferences. This is the exact opposite of faith or guesswork.

As to Trask's claim that science cannot legitimize itself except through circular reasoning, it is difficult to refute on the Postmodernist premise that science is just a "language game."⁶² But it is not—it is a pursuit that proposes and accomplishes actual results in the real world. This alone legitimizes science as an epistemological matter. Contrary to Trask's claim that science has no "superior claim to proof"⁶³ over supernaturalism, the predictive power of the modern world's rigorous scientific theories do indeed establish their superiority over supernaturalism. In 1967, a crowd of Vietnam War protestors led by Abbie Hoffman tried to use chanting and meditation to cause the Pentagon to levitate off the ground. Needless to say, this attempt failed. Two years later, NASA scientists put two men on the surface of the moon, using equations and experimentally tested theories tracing back to Sir Isaac Newton.⁶⁴ Science has a superior claim to legiti-

tence, 1 OBJECTIVITY 31 (1992).

⁵⁹ Of course, we can err in interpreting our perceptions, and some people's perceptual apparatus might not function properly. This is why science requires *intersubjectively accessible* data. In this connection, what Coke said of the common law is true also of science, that it is "nothing else but reason, which is to be understood of an artificial perfection of reason, gotten by long study, observation, and experience, and not of every man's naturall [sic] reason." EDWARD COKE, *THE FIRST PART OF THE INSTITUTES OF THE LAWS OF ENGLAND* *97b (William S. Hein Co. 1986) (1600–1615). This fact does not mean, however, that sensory data are taken on faith, however; just that they are corrected against observations by others.

⁶⁰ This is a complicated subject, far beyond the scope of this paper, and one on which scientists themselves differ. For in-depth discussions of the view (that I share) that the chain of reason need not be hooked to an arbitrarily assumed base, see AYN RAND, *INTRODUCTION TO OBJECTIVIST EPISTEMOLOGY* (Harry Binswanger & Leonard Peikoff eds., rev. 2d. ed., Meridian 1966); TIBOR R. MACHAN, *OBJECTIVITY: RECOVERING DETERMINATE REALITY IN PHILOSOPHY, SCIENCE, AND EVERYDAY LIFE* (2004); DAVID KELLEY, *THE EVIDENCE OF THE SENSES: A REALIST THEORY OF PERCEPTION* (1986).

⁶¹ See David Harriman, *Induction And Experimental Method*, 2 *THE OBJECTIVE STANDARD* 73, 100–07 (2007).

⁶² Trask, *supra* note 2 at 362.

⁶³ *Id.* at 364.

⁶⁴ See AYN RAND, *Apollo And Dionysus*, in *THE RETURN OF THE PRIMITIVE: THE ANTI-*

macy if for no other reason than that its techniques enable us to predict results and accomplish our ends on such a spectacular scale.

For a similar reason, science is “good.” There is a sense in which it is true that science—understood in the modern sense as a specific kind of research—cannot vouch for its own worth. If science is a worthy undertaking for human beings, it must fit into a hierarchy of values—of “goods” for human beings. That is, it must be justified in terms of its service of certain ends. The ends which science serves—the “relief of man’s estate”—are good ends because for human beings there simply cannot be any other definition of goodness than the flourishing of human beings.⁶⁵ There is no circularity in justifying science on these grounds: it is validated by its service of man’s needs. And once again, naturalistic science passes this test spectacularly. Trask approvingly quotes the Postmodernist Jean-François Lyotard, who writes that “there is no other proof that the rules [of science] are good than the consensus extended to them by the experts,”⁶⁶ but this is absurd: the proof that the rules of science are good are the smallpox vaccine, heart bypass surgery, jet aircraft, Apollo 11, and golden rice.⁶⁷ And these things, in turn, are good because they are good for man.

Science is not a religion. Although the word “religion” is notoriously difficult to define,⁶⁸ it is at least clear that it includes some reference to supernatural or transcendental forces that possess volition. In *United States v. Meyers*,⁶⁹ the court rejected the argument of a litigant who claimed to be a member of the “church of marijuana,” and provided a remarkably good definition of religion. Among other things, religions generally include reference to “fundamental questions about life, purpose, and death,” “address a reality which transcends the physical and immediately apparent world,” are usually “founded or significantly influenced by a deity, teacher, seer, or prophet who is considered to be divine, enlightened, gifted, or blessed,” “designate particular structures or places as sacred, holy, or significant,” include a “clergy . . . [who] are keepers and purveyors of religious know-

INDUSTRIAL REVOLUTION 99 (Peter Schwartz ed., Meridian 1999).

⁶⁵ TARA SMITH, *VIABLE VALUES* 125–45 (2000). Smith states that “[f]lourishing refers to a life that is prospering or in good condition” and that “what makes a life good is its being led in a life-furthering fashion.” *Id.* at 126–27.

⁶⁶ Trask, *supra* note 2, at 368 (quoting JEAN-FRANÇOIS LYOTARD, *THE POSTMODERN CONDITION: A REPORT ON KNOWLEDGE* 29 (Geoff Bennington & Brian Massumi trans., Univ. of Minnesota Press 1984) (1979).

⁶⁷ Of course, science has also brought us fearful things such as nuclear weapons. Nevertheless, science has alleviated far more human suffering than it has caused. J. BRONOWSKI, *THE COMMON SENSE OF SCIENCE* 146–47 (Harv. Univ. Press, 1978) (1951).

⁶⁸ See, e.g., Note, *Toward a Constitutional Definition of Religion*, 91 HARV. L. REV. 1056 (1978); Stanley Ingber, *Religion or Ideology: A Needed Clarification of the Religion Clauses*, 41 STAN. L. REV. 233 (1989); Ben Clements, Note, *Defining “Religion” in The First Amendment: A Functional Approach*, 74 CORNELL L. REV. 532 (1989); Andrew W. Austin, *Faith And The Constitutional Definition of Religion*, 22 CUMB. L. REV. 1 (1991–1992); Recent Case: *Massachusetts Supreme Judicial Court Invalidates Religious Holiday Statute Protecting Only Established Religions*, 110 HARV. L. REV. 541 (1996).

⁶⁹ 906 F.Supp. 1494 (D.Wyo. 1995), *aff’d* 95 F.3d 1475 (10th Cir. 1996).

ledge,” and “include some form of ceremony, ritual, liturgy, sacrament, or protocol . . . imbued with transcendent significance.”⁷⁰ These things are not true of science. To define science as a religion would require one to stretch the definition of “religion” too far, so that every form of belief, from the Boy Scout Oath to the platform of the Democratic Party to the beliefs of the most rigorous atheist, would also be a religion.⁷¹ Such a definition is unworkable, and, as the Ninth Circuit Court of Appeals has noted, “patently frivolous.”⁷² Indeed, such a definition of religion “cannot be found in the dictionary, in the Supreme Court cases, or anywhere in the common understanding of the words.”⁷³

D. All Epistemologies Are Not Created Equal

As Matthew J. Brauer, Barbara Forrest, and Steven G. Gey conclude in *Is It Science Yet?* (the definitive law review article on contemporary creationism⁷⁴), science’s focus on natural causation rather than supernatural

⁷⁰ *Id.* at 1502–03.

⁷¹ It is true that the Supreme Court, in a footnote in *Torcaso v. Watkins*, 367 U.S. 488, 495 n.11 (1961), identified “secular humanism” as one of the “religions” to which the First Amendment applies. But this footnote—dictum in that case—is not as conclusive as some writers contend. It, and the cases it cited on this point—*Washington Ethical Society v. District of Columbia*, 249 F.2d 127 (D.C. Cir. 1957) and *Fellowship of Humanity v. County of Alameda*, 153 Cal.App.2d 673 (1957)—did not address Establishment Clause issues, and did not hold that “humanism” (whatever that term might designate) is a religion for Establishment Clause purposes. See *Kalka v. Hawk*, 215 F.3d 90, 99 (D.C. Cir. 2000) (“The Court’s statement in *Torcaso* does not stand for the proposition that humanism, no matter in what form and no matter how practiced, amounts to a religion under the First Amendment.”). See also *Pelozo v. Capistrano Unified Sch. Dist.*, 37 F.3d 517, 521 (9th Cir. 1994) (“neither the Supreme Court, nor this circuit, has ever held that evolutionism or secular humanism are ‘religions’ for Establishment Clause purposes.”). This difference is important because the Establishment and Free Exercise Clauses cover different issues. See generally *Zelman v. Simmons-Harris*, 536 U.S. 639, 679 n.4 (2002) (Thomas, J., concurring); AKHIL REED AMAR, THE BILL OF RIGHTS: CREATION AND RECONSTRUCTION 246–57 (1998). What might be a protected individual right under the Free Exercise Clause—the right to subscribe to and practice a particular philosophical position—may not be barred to the government under the Establishment Clause. Take, for example, the faith of the World Church of the Creator, a white supremacist group that believes God created white people superior to black people. While the government is barred from obstructing the free exercise of such beliefs by the church’s members, it is not barred from declaring officially that whites and blacks are created equal, even though its doing so may offend members of the church. See generally *Hein v. Freedom From Religion Foundation, Inc.*, 127 S.Ct. 2553, 2582 (2007) (plurality) (“Is a taxpayer’s purely psychological displeasure that his funds are being spent in an allegedly unlawful manner ever sufficiently concrete and particularized to support Article III standing? The answer is plainly no.”).

In addition, the two cases cited by *Torcaso* involved humanist groups which sought tax exemptions that had been provided for religious organizations. Those two cases only addressed the question of whether belief in a “supreme being” was the *sine qua non* of “religion.” The groups in question engaged in many ceremonial and ritualistic practices that echoed traditional religious observances, which cannot be said of scientists or of most secular humanists. It appears that the religious group involved in *Washington Ethical Society*, in particular, were mystical or semi-mystical, and therefore that its characterization as “secular” is open to doubt. See 249 F.2d at 128 (“The services of the organization held at regular hours each Sunday have the forms of worship service with Bible readings, sermons, singing and meditation familiar in services of many formal or traditional church organizations. Its program bears the words ‘Where Men Meet to Seek the Highest is Holy Ground.’”).

⁷² *Pelozo*, 37 F.3d at 520.

⁷³ *Id.* at 521.

⁷⁴ Brauer *et al.*, *supra* note 3. It is inexplicable that Trask fails to cite this article, (or any other work which responds to the arguments he makes). No discussion of the evolution controversy is com-

causation “has nothing to do with a crass desire for explanatory (or political) hegemony. Scientists exclude the supernatural because they are unable to construct explanations that require access to a reality beyond the cognitive faculties and sources of knowledge humans are known to have.”⁷⁵ The argument by Trask, Philip Johnson⁷⁶, and others, that science excludes the possibility of supernaturalism in order to bar religion at the door is a misrepresentation. And, contrary to Trask’s contention that science’s success unfairly excludes religious belief from the marketplace of ideas, there is good reason that science has prevailed: it works. It was scientific research and experiment that cured smallpox, and not the fruitless efforts of countless millions who pursued other “narratives” through prayer and folk medicine.

Trask’s Postmodern notion that all epistemologies are created equal is belied by the common experience of mankind and by the very nature of knowledge. We can see the point clearly by simply rewriting a paragraph of Trask’s article to refer to a specific supernatural belief. The ancient Greeks thought that the winter cold was caused by Persephone’s visit to her husband Hades, the god of the underworld.⁷⁷ Modern astronomy has revealed that the seasons are caused by the tilt of Earth’s axis. But the demand for equal treatment of secular and supernatural beliefs might run along these lines:

The exclusive teaching of [the idea that the seasons are caused by the tilt of Earth’s axis] in public schools is an advancement of the religion of secular humanism. There is an inherent connection between [scientific astronomy] and the secular humanist worldview. Secular humanists generally reject knowledge that science cannot test [such as that Persephone’s visit to the underworld causes the seasons]. Since one cannot directly test the supernatural, secular humanists inevitably adopt a naturalistic worldview, which is the belief that there is only a natural realm and no supernatural. Any secular humanist theory about the [cause of the seasons] cannot rely on the supernatural because that would be inconsistent with naturalism. Therefore, there is an inherent link between secular humanism and [astronomy] because [astronomy] is an exclusively materialistic theory about the origin of [the seasons]. . . . [T]he exclusion of supernatural theories from science classes marginalizes religious belief. It creates the impression that secular humanism is a practical device that allows people to understand the world today, and religion is only an object of historical study concerning some deranged people of the past.⁷⁸

The absurdity makes the point clear: the reason supernatural “theories” are not a serious part of scientific discourse is that they have not fit the facts and have not yielded useful conclusions. Does Trask really be-

plete without reference to this paper.

⁷⁵ *Id.* at 50.

⁷⁶ Phillip E. Johnson, *Evolution as Dogma: The Establishment of Naturalism*, FIRST THINGS, Oct. 1990, available at <http://www.arn.org/docs/johnson/pjdogma1.htm>.

⁷⁷ See HOMERIC HYMN TO DEMETER, *reprinted in*, CLASSICAL MYTHOLOGY, *supra* note 49, at 164–74.

⁷⁸ Trask, *supra* note 2, at 381–83.

lieve such “theories” as Greek mythology ought to be accorded the same respect as our modern understanding of the causes of the seasons? After all, to call the Persephone myth a “myth” would denigrate it and make it seem deranged—because, of course, it *is*, by our standards. The Persephone myth is simply *not true*. For those who believe that “truth” is something more than a cultural prejudice, this is a convincing reason to exclude the Persephone myth from laboratories and science classes. Taken to its logical conclusion, Trask’s argument would require science teachers to include in their lessons a potentially infinite number of unsubstantiated dogmas,⁷⁹ as well as astrology, phrenology, heliocentrism, the flatness of the earth, and the immortality of the Count of St. Germain.

It is precisely because science is *not* a religion—that it focuses on empirically verifiable facts—that it is accessible to people of diverse backgrounds and is capable of getting them to change their minds. A person who insists on the truth of the Persephone myth, a belief amenable to no test in reality, cannot be shaken of that notion. But the person who holds a false belief while accepting empirical verification and experiment as a test of truth, can look at the evidence, do the experiments, and see where she has erred. As Suzanna Sherry notes, rational discourse becomes impossible in the absence of such an agreement on objective testing: “[a]necdotal evidence replaces scientific data, and telling stories becomes the equivalent of making rational arguments. Thus, what people say becomes as important as what they can ‘prove,’ Once the commonality of reason is rejected, knowledge is intensely personal”⁸⁰

Science and supernaturalism are simply not equally valid ways of understanding the world. Science, with its commitment to exclusively natural explanations, has proven itself with practical results, highly reliable predictions, a consistent and robust system of knowledge, an intricately integrated network of theory, and a universal culture of ideas and methods accessible to a widely diverse population. If any culture can lay claim to universal values, it is the culture of science.

II. THE ESTABLISHMENT CLAUSE AND NEUTRALITY

Nothing in the Constitution requires government to remain “neutral” between naturalistic and supernatural worldviews. The only restriction that the Constitution places on government’s relationship to supernaturalism

⁷⁹ I strongly suspect that Trask would *not*—as consistency would require of him—hold that the government should teach *every* religious view equally. Instead, I suspect he shares Justice Scalia’s view that the Constitution “permits . . . disregard of polytheists and . . . devout atheists” since “[t]he three most popular religions in the United States, Christianity, Judaism, and Islam—which combined account for 97.7% of all believers—are monotheistic.” *McCreary County, Ky. v. Am. Civ. Liberties Union of Ky.*, 125 S. Ct. 2722, 2753, (2005) (Scalia, J., dissenting). This, of course, in the words of James Madison, “is to lift the evil at once and exhibit in its naked deformity the doctrine that religious truth is to be tested by numbers, or that the major sects have a right to govern the minor.” JAMES MADISON, *Detached Memoranda*, in JAMES MADISON, WRITINGS 745, 763 (J. Rakove ed. 1999).

⁸⁰ Sherry, *supra* note 6, at 459.

appears in the First Amendment, which forbids government from “establishing” a religion or from interfering with those who wish to “exercise” their religions. In *Epperson v. Arkansas*,⁸¹ the Supreme Court held that “The First Amendment mandates governmental neutrality between religion and religion, and between religion and nonreligion,”⁸² but Trask and other writers have pulled this language out of context to suggest that government may not endorse or base its policies on scientific, natural explanations of the physical world.⁸³

This is obviously a misreading of the First Amendment. If government were truly required to remain neutral between “naturalism” and “supernaturalism,” it would be impossible for it to accomplish anything without making a potentially infinite number of paralyzing accommodations. For example, it would be unable to teach children that AIDS is caused by a virus, unless it provided equal time for those who believe that it is God’s punishment for the sin of sodomy.⁸⁴ It would not be allowed to prevent the abuse of women and children among communities that hold women to be second-class citizens and children the “property” of their parents, subject to “honor killings” and genital mutilation. And if a city happens to have any citizens with Aztec roots, it had better take care not to consult scientific research on fire hazards without also appeasing the fire god Huehuetotl, who liked to have newlywed couples sacrificed to Him.⁸⁵

This may sound flippant, but the reality is quite serious indeed. In July, 2007, police in Phoenix, Arizona responded to a domestic disturbance to discover 48-year old Ronald Marquez in the act of choking his three-year-old granddaughter to death. Looking on was the baby’s 19-year-old mother, naked and covered in blood. Marquez was performing an exorcism, trying to expel demons from the infant by strangling the life out of her. Police officers saved her life by tasing the man (who died from the shock).⁸⁶

A nation in which the First Amendment prohibits the government from “adopt[ing] a distinctly materialistic belief. . . that directly conflicts with other religious beliefs”⁸⁷ is one in which the police officers would be prohibited from saving this little girl’s life. After all, their doing so certainly “marginalized” the grandfather’s religious beliefs. Who are the police to say that the child was *not* suffering from demonic possession? To suggest that natural, scientific causes can account for whatever illness the child may have had is no answer, according to Trask’s argument, because it is based on an epistemology that is unfairly biased against supernaturalism.

⁸¹ 393 U.S. 97 (1968).

⁸² *Id.* at 104.

⁸³ Trask, *supra* note 2 at 371; *Contra* McRoberts & Sandefur, *supra* note 3, at 39–47 (responding to the “neutrality” argument).

⁸⁴ *Cf.* Sherry, *supra* note 6, at 482–83.

⁸⁵ MARY MILLER & KARL TAUBE, AN ILLUSTRATED DICTIONARY OF THE GODS AND SYMBOLS OF ANCIENT MEXICO AND THE MAYA 92 (1993).

⁸⁶ Elias C. Arnold, *Fatal End to Exorcism Attempt*, ARIZ. REPUBLIC, July 29, 2007, at A8.

⁸⁷ Trask, *supra* note 2 at 386.

Indeed, it would be a cruel form of cultural imperialism.

Trask's argument is clearly nonsense. A society which consistently prohibited its government from preferring secular reasoning over supernaturalism would be paralyzed. Moreover, the Constitution clearly contemplates a government which shall base its actions on secular reasons.

A. Consistent "Neutrality" Between World Views Would Be Unworkable

In *Employment Division v. Smith*,⁸⁸ the Supreme Court held that a person's religious beliefs cannot absolve him of obeying laws which are designed for a general, secular purpose. There, a religious group contended that a federal law against the use of hallucinogens violated their Free Exercise rights, since their religious ceremonies included the use of such drugs. The Court explained that that theory would grant religious believers a kind of heckler's veto over legitimate enactments. "Any society" which exempted people from laws whenever such people claimed a supernatural reason for such an exemption "would be courting anarchy," particularly given America's "diversity of religious beliefs, and its determination to coerce or suppress none of them. Precisely because 'we are a cosmopolitan nation made up of people of almost every conceivable religious preference,' and precisely because we value and protect that religious divergence, we cannot afford [that] luxury."⁸⁹ The argument that the First Amendment prohibits the government from any action which restricts a person's obedience to alleged supernatural revelation "would open the prospect of constitutionally required religious exemptions from civic obligations of almost every conceivable kind. . . ."⁹⁰

This conclusion is certainly true. As the Court noted, there are an indefinite number of religious claims purporting to exempt a person from the demands of a modern secular culture. Litigants have demanded religious exemptions for everything from school attendance laws⁹¹ to laws requiring children to be vaccinated.⁹² In one case, a group of prisoners claimed to have founded a religion which required them to be fed steak and wine at each meal!⁹³ Because supernatural claims have no test in reality, they can stop rational discourse and rational policies in their tracks. The First Amendment does not go so far. In fact, government is free to base its policies on secular considerations and to choose good science over bad.⁹⁴

⁸⁸ 494 U.S. 872 (1990).

⁸⁹ *Id.* at 888 (quoting *Braunfeld v. Brown*, 366 U.S. 599, 606 (1961)).

⁹⁰ *Id.*

⁹¹ *Wisconsin v. Yoder*, 406 U.S. 205 (1972).

⁹² *Cude v. State*, 377 S.W.2d 816 (Ark. 1964).

⁹³ *Therault v. Silber*, 391 F. Supp. 578, 582 (W.D. Tex. 1975), *vacated*, 547 F.2d 1279 (5th Cir. 1977).

⁹⁴ See *Jacobson v. Massachusetts*, 197 U.S. 11 (1905) (upholding Massachusetts legislature's decision to require vaccinations despite some scientific skepticism about the efficacy of vaccinations); *United States v. Downing*, 753 F.2d 1224, 1238 n.18 (3d Cir. 1985) (taking judicial notice "of the invalidity of . . . astrology or phrenology").

Moreover, government is free to *promote* sound science, by subsidizing its publication by private parties or by teaching it directly. This is unsurprising, since government is free to promote sound history, and other subjects. When one concedes that government may teach people about World War II—whether through government schools, or monuments, or other ways—one must concede that it may also teach them *accurately* that, for instance, it may teach about the Holocaust, despite the fact that there are people who deny that it occurred. When one concedes that government may teach students geography, one must also concede that it may teach them that the world is round, even though there are people who do not believe this.⁹⁵ If one concedes that the government has the right to give grants to private organizations that teach science, including science which some people consider controversial for religious reasons, then one must concede that government may choose to give grants to private organizations that make accurate statements about both the science and the religious controversy.⁹⁶

In *Crowley v Smithsonian Institution*,⁹⁷ the plaintiffs challenged the Smithsonian's use of government funds to set up an exhibit on evolution, arguing that it violated the Establishment Clause. The exhibit, they claimed, promoted what they called the "religion" of secular humanism.⁹⁸ Seeking to "balance [the] appellants' freedom to practice and propagate their religious beliefs in creation without suffering government competition or interferences and [the Smithsonian's] right to disseminate, and the public's right to receive, knowledge from government," the court concluded that the "balance was long ago struck in favor of diffusion of knowledge based on responsible scientific foundations, and against special constitutional protection of religious believers from the competition generated by such knowledge diffusion."⁹⁹ It noted that the "solid secular purpose of 'increasing and diffusing knowledge among men'"¹⁰⁰ was sufficient to permit the expenditure of federal funds despite the fact that some people might interpret the display as having religious connotations:

Nor does it follow that government involvement in a subject which is also important to practitioners of a religion becomes, therefore, activity in support of religion. For example, birth control and abortion are topics that involve both religious beliefs and general health and welfare concerns. Many religious leaders have vigorously opposed government support of the teaching and practice of birth control and government support, or even toleration, of abortion. Controver-

⁹⁵ Robert P.J. Day, Documenting the existence of the "International Flat Earth Society," <http://www.talkorigins.org/faqs/flatearth.html> (visited Sept. 29, 2007).

⁹⁶ But see Francis Beckwith, *Government-Sponsored Theology*, THE AMERICAN SPECTATOR, Apr. 7, 2004, http://www.spectator.org/dsp_article.asp?art_id=6395 (last visited Aug. 13, 2007) (arguing that Establishment Clause was violated when government-funded National Science Foundation gave grant to U.C. Berkeley to establish website on evolution.).

⁹⁷ 636 F.2d 738 (D.C. Cir. 1980).

⁹⁸ *Id.* at 740.

⁹⁹ *Id.* at 744.

¹⁰⁰ *Id.* at 740 (citation omitted).

sy, including litigation, about these subjects has been prolific and spirited. No court, however, has finally held that government advocacy of or opposition to either birth control or abortion violates the establishment clause of the first amendment.¹⁰¹

Trask objects to *Crowley* on the grounds that what he calls “evolutionism,”¹⁰² is “a religion because it takes a position on an issue that has always been at the center of religious belief systems, i.e., the origin of life and the universe.”¹⁰³ Thus, for the government to endorse it is a violation of constitutionally mandated neutrality. But nothing in the Constitution forbids the government from taking positions on “matters” that are “addressed” by religions. “We recognized that when the government appropriates public funds to promote a particular policy of its own it is entitled to say what it wishes.”¹⁰⁴ It may subsidize the pork industry and advertisements for pork even though religious scriptures take positions on the consumption of pork.¹⁰⁵ The government may urge people to practice safe sex even though doing so conflicts with certain religious views,¹⁰⁶ just as it may urge people not to obtain abortions.¹⁰⁷ In fact, the government may express “its” opinions in virtually any matter, regardless of the fact that there are some who would have religious objections to the messages in question. This is because “the antidisparagement principle [can] effectively silence the government on a great many matters to which the citizenry has some form of deep attachment.”¹⁰⁸ The *only* limitation on the messages which government may convey is that it may not “establish” a religious dogma in an official sense. While the exact meaning of “establishment” is a matter of constant dispute, it simply *cannot* be so broadly defined as to include the adoption of policies based on secular criteria, if the government is to have the capacity to act on any matter.

¹⁰¹ *Id.* at 742 (citations omitted). See also *Brown v. Hot, Sexy and Safer Prod., Inc.*, 68 F.3d 525 (1st Cir. 1995); *Cornwell v. State Bd. of Educ.*, 314 F.Supp. 340 (D.C. Md. 1969), *aff’d*, 428 F.2d 471 (4th Cir. 1970); *Civic Awareness of Am., Ltd. v. Richardson*, 343 F.Supp. 1358 (E.D. Wis. 1972); *Smith v. Ricci*, 446 A.2d 501 (N.J. 1982); Gregory G. Sarno and Alan Stephens, Annotation, *Constitutionality of Teaching or Otherwise Promoting Secular Humanism in Public Schools*, 103 A.L.R. FED. 538 (2005).

¹⁰² “Evolutionism” is commonly used as a value-laden term to imply that the scientific fact of evolution is an ideology. In fact, schools do not teach “evolutionism” any more than they teach “economicsism” or “historyism.” See *Pelozo v. Capistrano Unified Sch. Dist.*, 37 F.3d 517, 520–21 (9th Cir. 1994).

¹⁰³ Trask, *supra* note 2, at 386. Some scientists have contended that evolution takes no position on the origin of life, merely the development of life after it originated. See, e.g., *McLean v. Ark. Bd. of Ed.*, 529 F.Supp. 1255, 1266 (E.D. Ark. 1982) (“Although the subject of origins of life is within the province of biology, the scientific community does not consider origins of life a part of evolutionary theory.”). I disagree. Evolution is as useful in the search for the origin of what we call life as it is in describing the origin of species. See DENNETT, *DARWIN’S DANGEROUS IDEA*, *supra* note 45, at 149–85.

¹⁰⁴ *Rosenberger v. Rector & Visitors of Univ. of Va.*, 515 U.S. 819, 833 (1995).

¹⁰⁵ *Cf. Johanns v. Livestock Mktg. Ass’n*, 125 S. Ct. 2055 (2005).

¹⁰⁶ *Cf. Smith v. Bd. of Sch. Comm’rs of Mobile County*, 827 F.2d 684, 691 (11th Cir. 1987).

¹⁰⁷ *Cf. Rust v. Sullivan*, 500 U.S. 173, 194 (1991).

¹⁰⁸ Ira C. Lupu & Robert W. Tuttle, *The Limits of Equal Liberty as a Theory of Religious Freedom*, 85 TEX. L. REV. 1247, 1253 (2007).

B. Nothing In The Constitution Forbids A Commitment To Methodological Naturalism

The text of the Constitution clearly anticipates government acting on secular criteria. For example, Congress is given power to grant copyrights and patents in order to promote the progress of science and the useful arts—secular criteria.¹⁰⁹ Defendants may not be convicted of treason except on the testimony of two witnesses to the same overt act—not only secular criteria, but *empirical*, secular criteria.¹¹⁰ Juries are generally expected to convict on the basis of evidence, rather than on appeals to non-evidentiary matters such as faith.¹¹¹ Moreover, a government given the power to do X must be able to do X *effectively*.¹¹² If, as is the case, the most effective method of accomplishing its purposes is to rely on the scientific method and the data of naturalistic science, this alone is a sufficient, religiously-neutral justification for basing policy on science and not on supernaturalism. The framers of the Constitution and the Bill of Rights clearly anticipated that government would act on the basis of secular considerations, empirical data, and reason.

There is nothing in the Constitution's text or history that suggests that the founders considered "materialistic science" to be a "religion" covered by the First Amendment. Indeed, a great many of America's founders were themselves scientists who believed strongly in empiricism and the search for the material causes of phenomena.¹¹³ After hundreds of generations of humans had clung to a "supernatural theory" of lightning—that it was the weapon of Zeus, the spear of Odin, the weapon of Vajra—Constitution-signer Benjamin Franklin accounted for it through a natural, empirical explanation that allowed people to protect their buildings from lightning via the lightning rod. His contemporaries generally agreed that a true understanding of the world not only was possible through empirical research, but that such an understanding was to be applauded and encouraged, often by government subsidies.¹¹⁴ There is no evidence that Franklin or his con-

¹⁰⁹ U.S. CONST. art. I, § 8, cl. 8.

¹¹⁰ U.S. CONST. art. III, § 3.

¹¹¹ PENNOCK, *supra* note 28, at 295 ("Imagine the problems that would result if the courts had to accept legal theories of this sort. How would the court rule on whether to commit a purportedly insane person to a mental hospital for self-mutilation who claims that the Lord told her to pluck out her eye because it offended her? How would a judge deal with a defendant, Abe, accused of attempted murder of his son, Ike, who claims that he was only following God's command that he kill Ike to prove his faith?").

¹¹² *Cf. M'Culloch v. Maryland*, 17 U.S. (4 Wheat.) 316, 324–25 (1819) ("the grant of powers itself necessarily implies the grant of all usual and suitable means for the execution of the powers granted . . . [including] such powers as are suitable and fitted to the object; such as are *best* and *most useful* in relation to the end proposed.").

¹¹³ See, e.g., I. BERNARD COHEN, *SCIENCE AND THE FOUNDING FATHERS: SCIENCE IN THE POLITICAL THOUGHT OF JEFFERSON, FRANKLIN, ADAMS, AND MADISON* (1997).

¹¹⁴ Thomas Jefferson, a skeptic and freethinker, was behind such government-subsidized scientific undertakings as the Lewis and Clark expedition. See generally EDWIN T. MARTIN, *THOMAS JEFFERSON: SCIENTIST* (1952). James Madison, author of the First Amendment, advocated establishing a federally-funded university "in which no preferences or distinctions should be allowed on account of religion," 2 RECORDS OF THE FEDERAL CONVENTION OF 1787 at 616 (Max Farrand ed., Plimpton Press

temporaries understood the word “religion” to include scientific empiricism.¹¹⁵ instead, the Establishment and Free Exercise Clauses were understood as barring the state from compelling attendance to or support of an institution demanding spiritual allegiance to a dogmatic creed, and prohibiting the state from interfering with an individual’s obedience to the demands of the creed that he had freely accepted.¹¹⁶

There are certainly instances where government’s secular policies overlap the zone of religious freedom that is guaranteed by the Constitution, and where the enactment of such policies can intrude on the deeply held beliefs of religious practitioners. These are the hard cases in First Amendment law. But the closest the Supreme Court has ever come to holding that “neutrality” between religious sects bars the government from pursuing legitimate, secular policies, is *United States v. Ballard*.¹¹⁷ There, a 5–4 Supreme Court overturned the conviction of a defendant in a mail-fraud case who had been brought up on charges due to a faith-healing scheme. Justice Douglas declared for the majority that “the truth or verity of respondents’ religious doctrines or beliefs” should not have been considered by the trial court.¹¹⁸ For a court to convict a person of fraud on the basis that his religious doctrines were false would threaten the safety of religious dissenters. People “may not be put to the proof of their religious doctrines or beliefs.”¹¹⁹ The fact that religious dogmas are

[B]eyond the ken of mortals does not mean that they can be made suspect before the law. . . . The miracles of the New Testament, the Divinity of Christ, life after death, the power of prayer are deep in the religious convictions of many. If one could be sent to jail because a jury in a hostile environment found those teachings false, little indeed would be left of religious freedom.¹²⁰

1923) (1911), as did Benjamin Rush, devout Christian, signer of the Declaration of Independence, and pioneering physician and science enthusiast. ALYN BRODSKY, BENJAMIN RUSH: PATRIOT AND PHYSICIAN 295 (2004).

¹¹⁵ One indication of the distinction between religion and science in the minds of thinkers in the founding era appears in the first edition of the *Encyclopedia Britannica*:

We know but little of the nature of bodies; we discover some of their properties, as motion, figure, colours, &c. but of their essence we are ignorant: we know still much less of the soul, but of the essence or nature of God, we know nothing. . . . [W]e may discover his attributes by our reason, almost as clearly as we distinguish the properties of matter, and many other objects: and this knowledge is sufficient for us. The end of every other science is some temporal happiness; theology alone proposes an eternal felicity; its object therefore differs from all other sciences, as the age of threescore and ten differs from eternity.

3 *ENCYCLOPEDIA BRITANNICA* 533 (1771).

¹¹⁶ See, e.g., JAMES MADISON, *Memorial And Remonstrance Against Religious Assessments* (1785), reprinted in MADISON: WRITINGS 29, 30 (Jack N. Rakove, ed. 1999) (defining religion as “the duty which we owe to our Creator and the manner of discharging it”); THOMAS JEFFERSON, *A Bill for Establishing Religious Freedom*, in JEFFERSON: WRITINGS 346, 346–47 (Merril D. Peterson, ed., 1984) (distinguishing between “religious opinions” from “our opinions in physics or geometry.”).

¹¹⁷ 322 U.S. 78 (1944).

¹¹⁸ *Id.* at 86.

¹¹⁹ *Id.*

¹²⁰ *Id.* at 87.

Ballard is a hard case, especially after *Smith*,¹²¹ but it is at least clear that *Ballard* does *not* apply to government policies based on secular considerations unless those policies would *punish* a person for *professing* a religious faith.¹²² As the Supreme Court has noted, “The crucial word in the constitutional text is ‘prohibit’: ‘For the Free Exercise Clause is written in terms of what the government cannot do to the individual, not in terms of what the individual can exact from the government.’”¹²³ Government policies based on secular considerations generally do not mean the persecution of dissenters for their beliefs, and certainly not where appropriate accommodations are included for those whose faiths are extremely opposed to the policies.¹²⁴ Courts have tried to deal with these hard cases pragmatically, as in the blood-transfusion cases, where courts have held that while parents whose religious beliefs prohibit blood transfusions cannot be compelled to obtain transfusions for their children, courts can still order such transfusions by appointing guardians *ad litem*.¹²⁵ But courts have never—and can never—hold that government is required to accord equal respect to magical thinking as to scientifically established and empirically sound facts. To do so would simply be disastrous.¹²⁶ Certainly it is not warranted by the Constitution, which anticipates a government not only free to base its decisions on a preference for scientific understandings, but which is *expected* to do so.

C. To Teach Means To Teach Well

In *Heart of Darkness*, Joseph Conrad has given us a fitting image of

¹²¹ David E. Steinberg, *Rejecting The Case Against The Free Exercise Exemption: A Critical Assessment*, 75 B.U. L. REV. 241, 276–96 (1995).

¹²² *Smith*, 494 U.S. at 877 (describing *Ballard* as involving the “punish[ment of] expression of religious doctrines [the government] believes to be false”).

¹²³ *Lyng v. Northwest Indian Cemetery Protective Ass’n*, 485 U.S. 439, 451 (1988) (quoting *Sherbert v. Verner*, 374 U.S. 398, 412 (1963) (Douglas, J., concurring)).

¹²⁴ First Amendment law is so complicated that it is impossible to make general statements without exceptions. *West Virginia Bd. of Ed. v. Barnette*, 319 U.S. 624 (1943), rightly stands as a monument of religious freedom in this country even though it struck down a policy adopted for secular reasons, on the grounds that such policies violated the Free Exercise Clause. Still, in that case, children were subject to discipline by the state for refusing to swear the oath. Children are not subject to discipline for refusing to *believe* in evolution—although they must, of course, learn what evolution *means*.

¹²⁵ See, e.g., *In re Cabrera*, 552 A.2d 1114 (Pa. Super. Ct., 1989); *Jehovah’s Witnesses v. King’s County Hosp.*, 278 F. Supp. 488, 504 (W.D. Wash. 1967), *aff’d*, 390 U.S. 598 (1968).

¹²⁶ Where should courts draw the line? I contend that the line should be drawn at the level of the right to consent. Adults should be freely able to practice their religions and, of course, believe what they want, but should not be free to compel others:

The State arguably should not assign any *right*—that is, any legal *entitlement*—to protect choices and actions that are not a matter of self-determination. Such a right finds no support in general liberal political principles. To view religiously-motivated child medical neglect as a First Amendment issue is as much a conceptual mistake as it would be to view religiously-motivated wife-beating as a First Amendment issue. Additionally, this right directly conflicts with a principle that is basic to our legal and moral culture—namely, that no one is *entitled* to control the life of another person in accordance with their own preferences.

James G. Dwyer, *Spiritual Treatment Exemptions to Child Medical Neglect Laws: What We Outsiders Should Think*, 76 NOTRE DAME L. REV. 147, 163 (2000).

the person who is made to memorize the factual conclusions of science, without being taught the critical thinking and analytical skills at the heart of the scientific method. He describes a cannibal who has been trained to operate a steam-boat on the Congo:

He was useful because he had been instructed; and what he knew was this—that should the water in that transparent thing disappear, the evil spirit inside the boiler would get angry through the greatness of his thirst, and take a terrible vengeance. So he sweated and fired up and watched the glass fearfully. . . .¹²⁷

Such a person, knowing only the conclusions but not the method, may pull the right levers. But without understanding the techniques, he remains unable to master the physical world around him or to harness its energies for new advances. And he remains vulnerable to quacks and con-men who can mimic a scientist's language while making convincing-sounding assertions. This is the whole reason for teaching science in schools.¹²⁸ As Carl Sagan put it, "[i]f we teach only the findings and products of science—no matter how useful and even inspiring they may be—without communicating its critical method, how can the average person possibly distinguish science from pseudoscience? Both then are presented as unsupported assertion."¹²⁹

Evolution and other scientific discoveries are included in science curricula for an important reason: not so that students will memorize the facts, but so that they will become equipped with the intellectual tools that they need to be critical and independent thinkers who are not satisfied with shoddy evidence, appeals to authority, dogma, tradition, or magical thinking. Nothing is more important in a democratic society than that citizens be capable of innovative and discerning thought—that they be able to tell the genius from the crank, the idealist from the ideologue, the innocent from the guilty, and that they be able to figure out what is true and what is false.

Moreover, science is an essential part of the training for a free citizen because the values of scientific discourse—respect, freedom to dissent, and a demand for logical, reasoned arguments supported by evidence—create a common ground for people of diverse ethnicities and cultures. In a nation made up of people as different as we are, a commitment to tolerance and the search for empirically verifiable, logically established, objective truth suggests a path to peace and freedom. Our founding fathers understood this. Professor Sherry has said it well: "it is difficult to envision a civic republican polity—at least a polity with any diversity of viewpoints—without

¹²⁷ JOSEPH CONRAD, *HEART OF DARKNESS* 57 (New York: Pocket Books 1972) (1902).

¹²⁸ Of course, there is also the personal satisfaction to be gained by an accurate understanding of the world. See Epicurus, *Principal Doctrines* ¶12, in *THE STOIC AND EPICUREAN PHILOSOPHERS* 35, 36 (Witney J. Oates ed. 1940) ("A man cannot dispel his fear about the most important matters if he does not know what is the nature of the universe but suspects the truth of some mythical story. So that without natural science it is not possible to attain our pleasures unalloyed.").

¹²⁹ CARL SAGAN, *THE DEMON-HAUNTED WORLD: SCIENCE AS A CANDLE IN THE DARK* 21 (1995).

an emphasis on reason. . . . In a diverse society, no [definition of ‘the common good’] can develop without reasoned discourse.”¹³⁰

Science’s focus on empirical evidence and demonstrable theories is part of an Enlightenment legacy that made possible a peaceful and free society among diverse equals. Teaching that habit of mind is of the essence for keeping our civilization alive. To reject the existence of objective truth is to deny the possibility of common ground, to undermine the very purpose of scholarly, intellectual discourse, and to strike at the root of all that makes our values valuable and our society worthwhile. It goes Plato one better—it is the ignoble lie.¹³¹ At a time when Americans are threatened by an enemy that rejects science and reason, and demands respect for dogmas entailing violence, persecution, and tyranny, nothing more deserves our attention than nourishing respect for reason.

III. CONCLUSION

The debate over evolution and creationism has raged for a long time, and will continue to do so. The science behind evolution is overwhelming and only continues to grow,¹³² but those who insist that evolution is false will continue to resist its promulgation in schools. The appeal to Postmodernism represents the most recent—and so far, the most desperate—attempt on the part of creationists to support their claim that the teaching of valid, empirically-tested, experimentally-confirmed science in government schools is somehow a violation of the Constitution. When shorn of its sophisticated-sounding language, however, this argument is beneath serious consideration. It essentially holds that truth is meaningless; that all ways of knowing—whether it be the scientist’s empirically tested, experimentally confirmed, well-documented theory, or the mumbo-jumbo of mystics, psychics, and shamans—are equally valid myths; and that government has no right to base its policies on solid evidence rather than supernatural conjurations. This argument has no support in epistemology, history, law, or common sense. It should simply not be heard again.

¹³⁰ Sherry, *supra* note 6, at 471.

¹³¹ For a discussion of Plato’s “noble lie,” see PLATO, *Republic*, in THE COLLECTED DIALOGUES OF PLATO 575, 629–30 (Edith Hamilton & Huntington Cairns eds., Paul Shorey trans., Princeton Univ. Press 1961) (1938).

¹³² See JONATHAN WEINER, THE BEAK OF THE FINCH: A STORY OF EVOLUTION IN OUR TIME (1994).