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ARTICLE

THE ABSENCE OF RELIGIOUS NEUTRALITY IN K-12 PUBLIC SCIENCE EDUCATION

John H. Calvert[†]

Our public school . . . is organized on the premise that secular education can be isolated from all religious teaching so that the school can inculcate all needed temporal knowledge and also maintain *a strict and lofty neutrality as to religion*. The assumption is that after the individual has been instructed in worldly wisdom he will be better fitted to choose his religion. Whether such a disjunction is possible, and if possible whether it is wise, are questions I need not try to answer.¹

I. INTRODUCTION

This Article deals with the premise discussed by Justice Jackson in 1948 in *Everson* that “secular education can be isolated from all religious teaching” by inculcating only “temporal knowledge.” It questions how modern K-12 public education can do that and “*maintain a strict and lofty neutrality as to religion*,” when the curricula is expanded beyond the “temporal knowledge” taught in reading, writing, arithmetic, physics, and chemistry in 1948. Today’s curricula have been expanded to lead children, beginning at age five, to ask and answer ultimate questions addressed by all religions. These include: *where do we come from, what is the nature of the universe and life, what happens when we die, and what is the purpose of life, if any, and how should we live our lives ethically and morally?* The issues arise primarily in “science” classes – origins, health, behavioral, and social sciences.

Although the curricula have been expanded to address religious issues, they generally are not religiously neutral. The lack of neutrality arises because schools typically apply an unconstitutional non-neutral definition of “religion” in deciding what to teach and what to exclude. Religion is implicitly defined in its popular, rather than in its inclusive constitutional

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1. *Everson v. Bd. of Educ.*, 330 U.S. 1, 23-24 (1947) (Jackson, J., dissenting) (emphasis added) (holding that a state may pay the bus fares of all students, including those who attend parochial schools).

sense. The popular definition of religion incorrectly limits “religion” to theistic beliefs, while, in reality and in the constitutional sense, religion includes theistic, pantheistic and non-theistic religions. As ultimate religious questions are addressed, schools typically exclude the theistic views as “religious,” and then teach the non-theistic views as secular “science.”

This might produce neutral results if modern science actually approached the ultimate questions with the scrupulous objectivity it claims to apply. An objective discussion of the relevant facts and evidence should be functionally neutral. However, modern science is not objective as to these issues due to its concealed use of an orthodoxy called methodological naturalism (the “Orthodoxy”). The Orthodoxy requires that “scientific” investigations provide only materialistic/atheistic explanations about the ultimate religious questions addressed by the science curricula. Teaching only non-theistic and atheistic answers to religious questions is hardly neutral.

A scientist might argue that the Orthodoxy is “scientifically” true. If true, then a disclosed use and justification of it might actually achieve objectivity. However, a growing body of scientific evidence shows that physics and chemistry alone cannot explain the origin of our “fine-tuned” universe and life that appears “brilliantly designed for a purpose.”² In addition the application of the Orthodoxy itself contradicts the logic needed to test the historical narratives of origins science. Its ban of any consideration of the evidence-based teleological³ alternative produces a series of materialistic or atheistic just-so stories, rather than objective inferences to the best of the possible explanations.

2. SUZAN MAZUR, *THE ALTENBERG 16: AN EXPOSÉ OF THE EVOLUTION INDUSTRY* 99 (2010) (interview of atheist Richard Dawkins: Where do we get this powerful impression that animals and plants “have been brilliantly designed for a purpose? Where does that come from? That does not come from the laws of physics and chemistry on their own. That cannot come from anything that has so far been suggested by anybody other than [random mutations and] natural [sorting] selection.”) (emphasis and bracketed text added) (However, as “natural” sorting did not operate until after the origin of apparently designed physics and chemistry and replicating life, the explanation is logically inadequate to explain the source of that “brilliant design.”).

3. “[T]eleology: 1.a. the philosophical study of evidences of design in nature—compare MECHANISM.” *Teleology*, MERRIAM-WEBSTER’S UNABRIDGED DICTIONARY (2018). Teleology dates back before Socrates who applied it in his study of the human eye. The modern study of teleology is also sometimes referred to as “intelligent design.” The seemingly superfluous “intelligent” modifier is added to the word “design” to distinguish between explanations intending real design and explanations of materialistic science that frequently use teleological terms when real design is not intended, such as natural “selection,” the “design of the eye,” or “programmed” systems. Intended materialistic descriptors would be natural sorting, the occurrence of the eye, and systems which appear, but are not, programmed. See *infra* Section V.B.1.b.

Section VI of this Article provides criteria to be incorporated in an educational program designed to achieve the “strict and lofty neutrality” required by the Constitution and necessary for good science education that address religious issues. The criteria require that those issues be taught objectively and only to cognitively mature and knowledgeable students. The goal is to objectively equip students with the actual state of our scientific knowledge so that they may make their own informed decisions about religious issues. As a minimum, an objective curriculum will include lessons that will adequately inform students about the use and effect of use of the Orthodoxy on the explanations provided. This will respect the exclusive constitutional rights of parents to direct the religious education of their children and the rights of students to not be indoctrinated by the state with respect to a particular religious view.

The issue is exceedingly important. The question is whether our K-12 public schools will be permitted to continue to establish in all students a materialistic/atheistic religious worldview in the guise of “science.” Polls discussed in Section VII show that between 2007 and 2014 the percentage of the US population holding non-theistic beliefs grew from 16% to 23% at a rate of about 1% per year. The percentage of non-theistic teens aged thirteen to eighteen rose to 35% as of 2017. If objectivity is not implemented, one might expect the US to move from a nation required to be religiously neutral to one that is actually materialistic/atheistic in the not so distant future.

II. NEUTRALITY REQUIRES APPLICATION OF AN INCLUSIVE DEFINITION OF RELIGION

A. *The Popular Theistic Definition of “Religion” is Not Inclusive.*

Beginning with the settlement of the U.S. in 1604 by theists, most people considered religion to be about beliefs in a god. Different beliefs about his nature and commands produced different theistic religious sects, including: Pilgrims, Puritans, Anglicans, Catholics, Presbyterians, Unitarians, Universalists, and Jews. Atheists stayed in the closet as the word “atheist” was used exclusively as an insult. Nobody wanted to be regarded as an atheist because the word was an epithet implying a lack of moral restraint.⁴

However, for eons the world as a whole has been populated by many non-theistic religious belief systems, including Jainism, Buddhism, Confucianism, certain sects of Hinduism, and Taoism. Third Century B.C. Epicureanism, the precursor to modern Religious (“secular”) Humanism, was based on the

4. JENNIFER HECHT, *DOUBT: A HISTORY* 325 (2004).

ideas of Democritus, Epicurus, and Lucretius that the world reduced to different kinds of atoms, the chance interactions of which evolved naturally in an infinite universe into life without Divine intervention.⁵ The liberal Christian Universalists and Unitarians merged in 1961 to become primarily a non-theistic humanistic religion under the name of Unitarian Universalist Association.⁶ The Manifesto for “Religious Humanism” was published by Charles Potter, John Dewey, and others to proclaim a new religion that denied God, a soul and afterlife and sought to replace Biblical wisdom about how one should live life ethically and morally with materialistic “science and reason.”⁷

Since Darwin’s *Origin of the Species* in 1859, modern institutions of science have promoted non-theistic belief systems through a pursuit of the idea that the random interactions of matter, energy, and the forces per the laws of physics and chemistry that explain rocks and rivers, also explain the origin of the universe, life, and the diversity of life, all without the intervention of any intelligence. In recent years, institutions of science have converted the idea into a doctrine or orthodoxy called Methodological Naturalism (the “Orthodoxy”) which is explained in Section V.B.1, *infra*. The Orthodoxy effectively commits the scientific enterprise to focus its investigation in finding only evidence that supports materialistic/atheistic explanations of the “natural world.” The Orthodoxy bans any consideration of the logical, evidence-based teleological alternative that life and the cosmos may be the product of intelligent activity – that of a mind or minds.

A 2015 Pew Research Center report shows that use of the Orthodoxy has had the effect of increasing non-theistic beliefs in the U.S. at a recent rate of around 1% per year and an increase to about 23% of the overall population, as of 2014.⁸ When religion is viewed as just about belief in God, as is

5. John Calvert, *Kitzmiller’s Error: Defining “Religion” Exclusively Rather Than Inclusively*, 3 LIBERTY U. L. REV. 213, 224-25, 275-78 (2009).

6. Mark W. Harris, *Unitarian Universalist Origins: Our Historic Faith*, UNITARIAN UNIVERSALIST ASS’N, <https://www.uua.org/beliefs/who-we-are/history/faith> (last visited Jan. 27, 2018).

7. CHARLES FRANCIS POTTER, HUMANISM: A NEW RELIGION 3, 128 (1930) (“Education is the most powerful ally of Humanism, and every American public school is a school of Humanism. What can the theistic Sunday Schools, meeting for an hour once a week, and teaching only a fraction of the children, do to stem the tide of a five-day day program of humanistic teaching?”); AMERICAN HUMANIST ASSOCIATION, *Humanist Manifesto I* (1933), <https://americanhumanist.org/what-is-humanism/manifesto1/> (last visited Jan. 27, 2017).

8. PEW RESEARCH CENTER, *U.S. Becoming Less Religious* 3 (Nov. 2015), http://assets.pewresearch.org/wp-content/uploads/sites/11/2015/11/201.11.03_RLS_II_full_report.pdf (last visited Jan. 27, 2018).

implicitly the case with the Pew Poll's definition of religion, then the data shows that "the U.S. [is] *Becoming Less Religious*."⁹ However, when religion is viewed inclusively to include both theistic, pantheistic, and non-theistic belief systems, then there is no decline – there is only a shift in the religious demography from decreasing theistic to increasing non-theistic beliefs.

B. The True and Constitutional Definition of Religion is "Comprehensive" and Includes Theistic, Pantheistic and Non-Theistic Belief Systems.

1. The True Definition of "Religion" is Inclusive.

The courts and religious scholars have recognized that many religions are non-theistic while others are "pantheistic." In *God is Not One*, Stephen Prothero, a professor of religion at Boston University, identifies eight "rival religions" that "run the world."¹⁰ Of the eight, only three are entirely theistic: Christianity, Islam, and Judaism. The other five non-theistic and pantheistic religions are Atheism, Confucianism, Hinduism (certain sects), Buddhism, Yourba, and Daoism.

The inclusive nature of religion was recognized by the U.S. Courts beginning in 1957, as a growing number of non-theists began to claim that "religion" was not limited to belief in God, but also included non-theistic belief systems, such as Religious Humanism and Atheism. These cases arose in contexts where non-theistic belief systems benefited by a religious classification. The foundational case, *Fellowship of Humanity v. County of Alameda*, involved a group of Humanist churches in California who sought religious tax exemptions for their church properties. The exemptions were denied by the county because the belief system promoted by the churches was non-theistic – one that denies the supernatural. The California appellate court disagreed:

In the first place there are forms of belief generally and commonly accepted as religions and whose adherents, numbering in the millions, practice what is commonly accepted as religious worship, which do not include or require as essential the belief in a deity. Taoism, classic Buddhism, and Confucianism, are among these religions. In the second place, there are dictionary definitions and decided cases holding that the terms "religion"

9. *Id.*

10. See generally, STEPHEN PROTHERO, *GOD IS NOT ONE: THE EIGHT RIVAL RELIGIONS THAT RUN THE WORLD AND WHY THEIR DIFFERENCES MATTER* (2010).

and “religious worship” do not necessarily import a belief in a deity.¹¹

Judge Peters concluded that “religion” should be defined functionally based on how the belief functions in the lives of the holder: “[t]hus the only inquiry in such a case is the *objective* one of whether or not the belief occupies the same place in the lives of its holders that the orthodox beliefs occupy in the lives of believing majorities. . . .”¹² He then concluded that:

Religion simply includes: (1) a belief, not necessarily referring to supernatural powers; (2) a cult, involving a gregarious association openly expressing the belief; (3) a system of moral practice directly resulting from an adherence to the belief; and (4) an organization within the cult designed to observe the tenets of belief. The content of the belief is of no moment.¹³

The U.S. Supreme Court subsequently adopted Judge Peters’ functional test of religion in a case involving an agnostic¹⁴ conscientious objector who held no belief in a God:

[T]he test of belief “in a relation to a Supreme Being” is whether a given belief [such as an agnostic belief] that is sincere and meaningful occupies a place in the life of its possessor parallel to that filled by the orthodox belief in God of one who clearly qualifies for the exemption.¹⁵

In *Torcaso v. Watkins*,¹⁶ an Atheist elected to an office was required by a statute as a condition to taking the office to give an oath to God that he would perform in a particular manner. Since he did not believe in God, he argued that the statute burdened the free exercise of his religion. In affirming the Atheist, the Court concluded:

11. Fellowship of Humanity v. Cty. of Alameda, 315 P.2d 394, 401 (Cal. Ct. App. 1957).

12. *Id.* at 406 (emphasis added).

13. *Id.*

14. United States v. Seeger, 380 U.S. 163, 165-66 (1965) (“Although he did not adopt verbatim the printed Selective Service System form, he declared that he was conscientiously opposed to participation in war in any form by reason of his ‘religious’ belief; that he preferred to leave the question as to his belief in a Supreme Being open, ‘rather than answer “yes” or “no”’; that his ‘skepticism or disbelief in the existence of God’ did ‘not necessarily mean lack of faith in anything whatsoever’; that his was a ‘belief and devotion to goodness and virtue for their own sakes, and a religious faith in a purely ethical creed.’”).

15. *Id.* (bracketed text added)

16. *Torcaso v. Watkins*, 367 U.S. 488 (1961).

We repeat and again reaffirm that neither a State nor the Federal Government can constitutionally force a person “to profess a belief or disbelief in any religion.” Neither can constitutionally pass laws or impose requirements which aid all religions as against non-believers, and neither can aid those religions based on a belief in the existence of God as against *those religions founded on different beliefs*.¹⁷

In note 11, Justice Black made clear: “Among religions in this country which do not teach what would generally be considered a belief in the existence of God are Buddhism, Taoism, Ethical Culture, Secular Humanism and others.”¹⁸

The comprehensive nature of the constitutional meaning of religion was explained by Justice Frankfurter in *McGowan v. Maryland*, “[b]y its nature, religion – *in the comprehensive sense in which the Constitution uses that word* – is an aspect of human thought and action which profoundly relates the life of man to the world in which he lives.”¹⁹

But where is the demarcation between the secular and the religious if it is not belief or disbelief in God? This question was addressed by Judge Adams of the Third Circuit in two back to back cases – *Malnak v. Yogi*²⁰ and *Africa v. Pennsylvania*.²¹ In *Malnak*, plaintiffs complained that a K-12 public school course in the “science of creative intelligence and transcendental meditation” (SCI/TM) promoted a non-theistic religion in violation of the Establishment Clause. The defendant school countered that it was science and not religion. But, even if it was religion, the Establishment Clause meaning of religion was not as broad as the meaning of religion under the Free Exercise Clause. On the other hand, the plaintiff in *Africa*, a prisoner, argued that his belief in a particular diet was religious and therefore the prison’s withholding of that diet abridged his religious freedom.

Judge Adams concluded after lengthy analysis that SCI/TM was religious for Establishment Clause purposes but beliefs about diet were not. In

17. *Id.* at 495 (emphasis added).

18. *Id.* at 495 n.11. In that same footnote, Justice Black also referenced cases, almanacs, and other sources to support his proposition (“See *Washington Ethical Society v. District of Columbia*; *Fellowship of Humanity v. County of Alameda*; II *Encyclopedia of the Social Sciences*; 4 *Encyclopedia Britannica*; *Archer, Faiths Men Live By*; 1961 *World Almanac*; [and] *Year Book of American Churches for 1961*.”) (citations omitted).

19. *McGowan v. Maryland*, 366 U.S. 420, 461 (1961) (Frankfurter, J. concurring) (emphasis added).

20. *Malnak v. Yogi*, 592 F.2d 197, 211-12 (3d Cir. 1979).

21. *Africa v. Pennsylvania*, 662 F.2d 1025, 1032 (3d Cir. 1981).

reaching his holding in *Africa*, he set out three indicia that may be used to determine the existence of a religion:

First, a religion addresses *fundamental and ultimate questions* having to do with deep and imponderable matters. *Second*, a religion is comprehensive in nature; it consists of a belief-system as opposed to an isolated teaching. *Third*, a religion often can be recognized by the presence of certain formal and external signs.²²

The subject matter of the belief system is listed in the first criteria—“fundamental and ultimate questions.” Adams then elaborated on the nature of “fundamental and ultimate questions:”

Fundamental and ultimate questions. Traditional religions consider and attempt to come to terms with what could best be described as “ultimate” questions—questions having to do with, among other things, life and death, right and wrong, and good and evil. Not every tenet of an established theology need focus upon such elemental matters, of course; still, it is difficult to conceive of a religion that does not address these larger concerns. For, above all else, religions are characterized by their adherence to and promotion of certain “underlying theories of man’s nature or his place in the Universe,”²³

Judge Adams’ conclusion that ultimate questions mark the dividing line between the religious and the secular is consistent with those of religious scholars. Roy Clouser, a professor of philosophy and religion, addresses the question raised by Judge Adams in *The Myth of Religious Neutrality*. Based on fifty years of investigation Clouser sought to “define the nature of religious belief by seeking common features among the central beliefs of the world’s religious traditions . . . [W]e are trying to arrive at an understanding of what religion – any religion – is.”²⁴ In seeking to answer this question, he included in his survey recognized religions such as Judaism, Christianity, Islam, Hinduism, Buddhism, Taoism, as well as ancient religions such as Epicureanism, Druidism, Zoroastrianism, and Shintoism “and a host of other candidates.”

In his search for the common elements of all of these diverse belief systems, Clouser first eliminated elements that *are not common* to all

22. *Id.* (emphasis added).

23. *Id.* at 1033 (quoting *Founding Church of Scientology v. United States*, 409 F.2d 1146, 1160 (D.C. Cir.1969)).

24. ROY A. CLOUSER, *THE MYTH OF RELIGIOUS NEUTRALITY: AN ESSAY ON THE HIDDEN ROLE OF RELIGIOUS BELIEF IN THEORIES* 9 (2005).

religions. Not all religions have rituals, worship, worship of a creator or superhuman controlling power, or a specific code of morality and ethics.²⁵ After excluding common elements one often associates with religion, he then turned to the key question—what *is common* among all of these religious belief systems? What subjects or issues do all religions address?

Clouser concludes that all religious beliefs *begin* with a belief about what is the “unconditional non-dependent reality.” “A religious belief is a belief in something as divine per se no matter how that is further described, where ‘divine per se’ means having *unconditionally non-dependent reality*.”²⁶

For the traditional theist, the ultimate or unconditional non-dependent reality is a self-existing Creator God who created the universe and the life in it and then created life for a purpose. However, for the Atheist, the unconditional non-dependent reality is a self-existing universe that reduces to nothing more than matter, energy, and the forces. Life just *emerges* via random unguided evolutionary processes, not by the intellect of a supernatural entity. In simpler terms, the unconditional non-dependent reality is the answer to this question: *Where do we come from?* What is the ultimate cause of the universe and life?

Clouser then recognizes that “although this definition captures the essential core of religious belief in its primary sense,” it does not “cover still other beliefs in realities thought to be *divine dependent* rather than *divine per se*.”²⁷ Nor does it “cover still other beliefs that also deserve to be called ‘religious’ in yet other secondary senses.”²⁸ So to complete his definition of religious belief he concludes that:

A belief is a religious belief provided that:

- (1) It is a belief in something as divine per se no matter how that is further described, or
- (2) it is a belief about how the non-divine depends upon the divine per se, or
- (3) it is a belief about how humans come to stand in proper relation to the divine per se; and
- (4) where the central core of divinity per se is to have the status of unconditional non-dependent reality.²⁹

25. *Id.* at 10–12.

26. *Id.* at 23 (emphasis added).

27. *Id.*

28. *Id.*

29. *Id.* at 24.

Based on this definition of religious belief, Clouser then classifies religions into three broad categories: the traditional theistic, the materialistic/naturalistic/atheistic or “pagan,” and the pantheistic. In many respects the pantheistic and materialistic/atheistic are harmonious, as they do not depend on a Creator God that intervenes in the universe to make life for a purpose. We note that Clouser’s definition of religious belief addresses three “ultimate questions” that are commonly associated with all religious beliefs:

- (1) Where do we come from – what is the origin of life and the universe?
- (2) What is the nature and purpose of life, if any, and what happens when it ends?
- (3) How should life be lived ethically and morally?³⁰

Answers to these three questions will identify the unconditional non-dependent reality, how the non-divine life depends on that reality and how it may come to stand in proper relationship to it. Thus, Clouser’s definition of religious belief identifies a hierarchy of ultimate religious questions that all religions address: (1) what is the cause of the universe and life, (2) what is their nature, and (3) how should life be lived ethically and morally?

2. To Ensure Neutrality “Religion” is Required to be Inclusive for Both Establishment Clause and Free Exercise Purposes.

The First Amendment, as modified by the Fourteenth Amendment, states that no governmental agency “shall adopt a policy respecting an establishment of religion, or prohibiting the free exercise thereof.”

In *Malnak v. Yogi*, plaintiffs complained that a school course that taught non-theistic transcendental meditation violated the Establishment Clause as it endorsed a particular religious view.³¹ The school defended on the ground that it was permissible to define religion broadly under the Free Exercise Clause so that Atheists would not have to take an oath to God to hold office. However, an inclusive definition of religion under the Establishment Clause would unduly restrict the subject matter that government might support.

30. This definition is consistent with the RANDOM HOUSE WEBSTER’S COLLEGE DICTIONARY (2005) definition of religion: “religion: 1. a set of beliefs concerning the cause, nature, and purpose of the universe, esp. when considered as the creation of a superhuman agency or agencies, usu. involving devotional and ritual observances, and often containing a moral code for the conduct of human affairs.” It is also consistent with the MERRIAM-WEBSTER’S UNABRIDGED DICTIONARY (2018): “religion 1: commitment or devotion to a god or gods, a system of beliefs, or religious observance.” *Id.* (emphasis added).

31. *Malnak v. Yogi*, 592 F.2d 197, 197-98 (3d Cir. 1979).

Judge Adams disagreed for two reasons. First, the word “religion” appears only in the Establishment Clause and not in the Free Exercise Clause. It is incorporated by reference into the Free Exercise Clause. Thus, the meaning is incorporated as well as the word. So if religion is inclusive for Free Exercise purposes, it logically must be inclusive for Establishment Clause purposes.³²

However, Judge Peters explained that the functional need for an inclusive definition of religion in the Establishment Clause is to ensure that its application effects religious neutrality. An exclusive definition would be discriminatory rather than neutral.

Such an approach would create a three-tiered system of ideas: those that are unquestionably religious and thus both free from government interference and barred from receiving government support; those that are unquestionably non-religious and thus subject to government regulation and eligible to receive government support; *and those that are only religious under the newer approach and thus free from governmental regulation but open to receipt of government support. That belief systems classified in the third grouping are the most advantageously positioned is obvious. No reason has been advanced, however, for favoring the newer belief systems over the older ones.* If a Roman Catholic is barred from receiving aid from the government, so too should be a Transcendental Mediator or a Scientologist if those two are to enjoy the preferred position guaranteed to them by the free exercise clause. It may be, of course, that they are not entitled to such a preferred position, but they are clearly not entitled to the advantages given by the first amendment while avoiding the apparent disadvantages. *The rose cannot be had without the thorn.*³³

The 1992 Supreme Court’s decision in *Lee v. Weisman*³⁴ settled the issue. In *Lee*, a public school using a theistic definition of religion argued that an

32. *Id.* at 211.

33. *Id.* at 212-13 (emphasis added).

34. *Lee v. Weisman*, 505 U.S. 577 (1992). *See also* Kaufman v. McCaughtry, 419 F.3d 678, 682 (7th Cir. 2005) (“As the Court put it in *Wallace v. Jaffree*: ‘At one time it was thought that this right [referring to the right to choose one’s own creed] merely proscribed the preference of one Christian sect over another, but would not require equal respect for the conscience of the infidel, the atheist, or the adherent of a non-Christian faith such as Islam or Judaism. But when the underlying principle has been examined in the crucible of litigation, the Court has unambiguously concluded that the individual freedom of conscience protected by the First Amendment embraces the right to select any religious faith or none at all. In keeping with this

invocation at a graduation ceremony was neutral and non-preferential because the God being prayed to was not identified. Non-theistic Free Thinkers³⁵ disagreed as the invocation preferred theists over non-theists.

The Court agreed with the Free Thinkers, holding that religion under the Establishment Clause included both theistic and non-theistic belief systems. In their concurrence, Justices Souter, Stevens, and O'Connor, explained that the "settled law" is that the "Clause applies 'to each of us, be he Jew or Agnostic, Christian or Atheist, Buddhist or Freethinker,'"³⁶ and that many Americans who consider themselves religious are not theistic:

Many Americans who consider themselves religious are not theistic; some, like several of the Framers, are deists who would question Rabbi Gutterman's plea for divine advancement of the country's political and moral good. Thus, a nonpreferentialist who would condemn subjecting public school graduates to, say, the Anglican liturgy would still need to explain why the government's preference for theistic over nontheistic religion is constitutional.³⁷

Justice Kennedy, writing for the majority, noted that a prayer to God reflects a preference that when embraced by the state amounts to the establishment of an impermissible³⁸ "religious orthodoxy."³⁹ The flip side of this is that a thirteen-year program of education based on a materialistic/atheistic orthodoxy would seem to be impermissible as well.

idea, the Court has adopted a broad definition of "religion" *that includes nontheistic and atheistic beliefs, as well as theistic ones.*") (emphasis added).

35. The plaintiff parents and student won the Freethinker of the Year award for 1992 issued by the Freedom from Religion Foundation. FREEDOM FROM RELIGION FOUNDATION, *Freethinker of the Year Award* (1992) <https://ffrf.org/outreach/awards/freethinker-of-the-year-award/item/11919-the-weisman-family> (last visited March 20, 2018). "Freethought" is promoted by the Freedom from Religion Foundation, an atheistic organization that seeks freedom from theistic religion, not all religion. See discussion *infra* Section III.C.

36. *Lee*, 505 U.S. at 611 (quoting *School Dist. of Abington Twp. v. Schempp*, 374 U.S. 203, 319-20 (1963) (Stewart, J., dissenting)).

37. *Id.* at 611 (Souter, J. concurring) (emphasis added).

38. See *id.* at 592 ("A state-created orthodoxy puts at grave risk that freedom of belief and conscience which are the sole assurance that religious faith is real, not imposed.").

39. See *id.* ("What to most believers may seem nothing more than a reasonable request that the nonbeliever respect their religious practices, in a school context may appear to the nonbeliever or dissenter to be an attempt to employ the machinery of the State to enforce a religious orthodoxy.").

C. *Although the Courts Have Defined Religion Inclusively, Few in the Marketplace Use That Definition in Actual Practice.*

One example of the implicit use of a theistic definition of religion is the name of an atheistic organization called the Freedom from Religion Foundation. In 2010, the organization published a series of advertisements during the Christmas season designed to discredit theism and to promote Atheism. Each advertisement promoted a core tenet of Atheism by denigrating the corresponding theistic tenet. The tenet that there is no supernatural or god was proclaimed by a display stating: “YES VIRGINIA, THERE IS NO GOD”; the tenet that life is not created as it emerges from unguided evolutionary processes was promoted by an ad that urged one to “PRAISE DARWIN: EVOLVE BEYOND BELIEF.” The idea that because life reduces to matter, there is no afterlife, was promoted by the slogan: “ENJOY LIFE NOW. THERE IS NO AFTERLIFE,” and the idea that we should rely on human reason rather than the wisdom of God to guide the living of life, was promoted by ads urging the public to celebrate “reason”: “YOU KNOW ITS A MYTH: THIS SEASON CELEBRATE REASON”; and “SLEEP IN ON SUNDAYS: I HAVE FAITH IN PEOPLE, NOT IN A GOD.”⁴⁰

These ads make clear that the Freedom from Religion Foundation does not truly seek to be free of “religion.” Instead it seeks only freedom from theistic religion. Using the constitutionally inclusive definition, the functional name of the organization is the “Freedom from [*Theistic*] Religion Foundation,” a goal the state may not support.

Another example is the manner in which the Pew Research Center that studies religion in the U.S. classifies Atheists. They are included in the category of “religiously unaffiliated” or not religious.⁴¹ Accordingly, because of a noticeable shift in the U.S. from theism to atheism the organization concludes that: “The U.S. Public is Becoming Less Religious.”⁴² In fact, the data shows that the religious nature of the public is *not declining*, rather it is *shifting* from theistic to non-theistic beliefs.

The issue is crucially important in public education. As explained by Judge Adams, *supra*, a not religious classification for Establishment Clause but not for Free Exercise purposes discriminates for atheists and other non-theists and against theists. It entitles non-theistic groups to governmental aid and support but not to governmental regulation. Thus, if Atheism is not

40. INTELLIGENT DESIGN NETWORK, INC., *Christmas Advertising Reported by ABC News During 2010 Christmas Season Illustrating Basic Tenets of Atheism*, http://www.intelligentdesignnetwork.org/Tenets_of_Atheism.jpg (last visited Dec. 13, 2017).

41. PEW RESEARCH CENTER, *supra* note 8, at 17.

42. *Id.* at 3.

religious, then public schools may endorse it and teach all of the tenets of Religious (“secular”) Humanism in the guise of “science.” This was the vision of the founders of “Religious Humanism” developed in the first half of the twentieth century by John Dewey, Charles Potter, and others to insert into the public school.⁴³

III. THE SCOPE OF THE SECULAR SPHERE WHICH GOVERNMENT MAY OCCUPY WITHOUT RESTRICTION TURNS ON THE DEFINITION OF RELIGION

In *Gillette*, the Supreme Court used the metaphor of a “sphere” of human activity with respect to which government activity must be religiously neutral: “[T]he Establishment Clause stands at least for the proposition that when government activities *touch on the religious sphere*, they must be secular in purpose, evenhanded in operation, and *neutral in primary impact*.”⁴⁴

Surrounding the religious sphere is a secular sphere where government can act as it pleases. A way to expand this unrestricted sphere is to define the religious sphere narrowly. This is shown metaphorically in the sphere on the left in the diagram in Section III.B. *infra*.

A. *The Definitions of “Secular” and “Neutral” Turn on the Definition of Religion as “Secular” Means “Not Religious” and “Neutral” Means Not Favoring or Disfavoring One Religious View Over Another.*

As explained in *Kitzmiller’s Error: Defining “Religion” Exclusively Rather Than Inclusively* (“*Kitzmiller’s Error*”) and the Merriam-Webster and Random House dictionaries, the word “secular” means not religious.⁴⁵ The meaning of the word is important as a state may engage in an activity if it does so with a “secular purpose and neutral effect.”⁴⁶

43. CHARLES FRANCIS POTTER, *HUMANISM: A NEW RELIGION* 3, 128 (1930) (“Education is the most powerful ally of Humanism, and every American public school is a school of Humanism. What can the theistic Sunday Schools, meeting for an hour once a week, and teaching only a fraction of the children, do to stem the tide of a five-day program of humanistic teaching?”).

44. *Gillette v. United States*, 401 U.S. 437, 450 (1971) (emphasis added).

45. Calvert, *supra* note 5, at 275-78 (defining “secular” as “1. of or pertaining to worldly things or to things that are not regarded as religious, spiritual, or sacred; temporal: secular interests. 2. not pertaining to or connected with religion.”); See also RANDOM HOUSE WEBSTER’S UNABRIDGED DICTIONARY (1999) (defining “secular” as “1.b. not overtly or specifically religious.”).

46. See *Bd. of Educ. v. Allen*, 392 U.S. 236, 243 (1968) (“Three such tests may be gleaned from our cases. First, the statute must have a secular legislative purpose; second, its principal or primary effect must be one that neither advances nor inhibits religion.”) See also *Lemon v.*

If the effect is secular or not religious, then its effect will likely be deemed neutral as to religion. Thus, if the effect is atheistic (one which excludes God), which is secular under the exclusive definition of religion, then a government that promotes Atheism may be deemed “neutral” as to religion. The opposite is the case if religion includes Atheism or disbelief in a supernatural. Then state promotion of it is neither secular nor neutral.

This is illustrated in the case of *Lee v. Weisman*.⁴⁷ In *Lee*, a school defending an invocation to an unnamed god defined religion as exclusively devoted to the worship of God. It claimed that a prayer to an unnamed god was therefore non-sectarian or neutral as it did not favor one “religion” over another. The court disagreed as “a nonpreferentialist who would condemn subjecting public school graduates to, say, the Anglican liturgy would still need to explain why the government’s preference for theistic over nontheistic religion is constitutional.”⁴⁸

B. The Sphere of State Influence Expands with a Narrow Theistic Definition and Shrinks with an Inclusive Definition of Religion.

As previously mentioned, the extent of the secular sphere varies depending on the definition of religion employed. The diagram below metaphorically compares the scope and size of the central religious spheres and the surrounding secular spheres using an exclusive theistic definition of religion (the spheres on the left) and an inclusive definition (spheres on the right). Note that the central religious sphere on the left is very small as it excludes all religious belief systems other than theistic ones. The opposite is the case with the sphere on the right where non-theistic belief systems are included. With a theistic definition of religion, so long as the state excludes or shuns theistic ideas it remains outside the sphere where it can embrace the non-theistic views exclusively under a false banner of secularity that is not functionally neutral.

With an inclusive definition, the “religious sphere” includes religious issues addressed by all religions that touch on the cause and nature of life and the universe and how life should be lived ethically and morally. This definition expands the restrictive religious sphere enormously. For example, in *Lemon v. Kurtzman*, the Court considered a statute that defined purely secular subjects as including “mathematics, modern foreign languages, physical science, and

Kurtzman, 403 U.S. 602, 612-13 (1971) (the statute must not foster “an excessive government entanglement with religion.”).

47. *Lee v. Weisman*, 505 U.S. 577, 583 (1992).

48. *Id.* at 617 (emphasis added).

physical education.”⁴⁹ Interestingly, the list did not include life science which is secular in content until it addresses the origin and nature of life and the universe. Health science also strays into religion when it addresses issues about abortion and the sanctity of life, human sexuality, and the roles of members of a “family,” and what a family is. With an inclusive definition of religion, state teaching about these issues may not favor or prefer one religious belief over another. Therefore, if the issues are addressed at all they must be addressed with rigorous objectivity.⁵⁰

The effect of the discriminatory and non-discriminatory definitions is shown by the following diagram from *Kitzmiller’s Error*:⁵¹

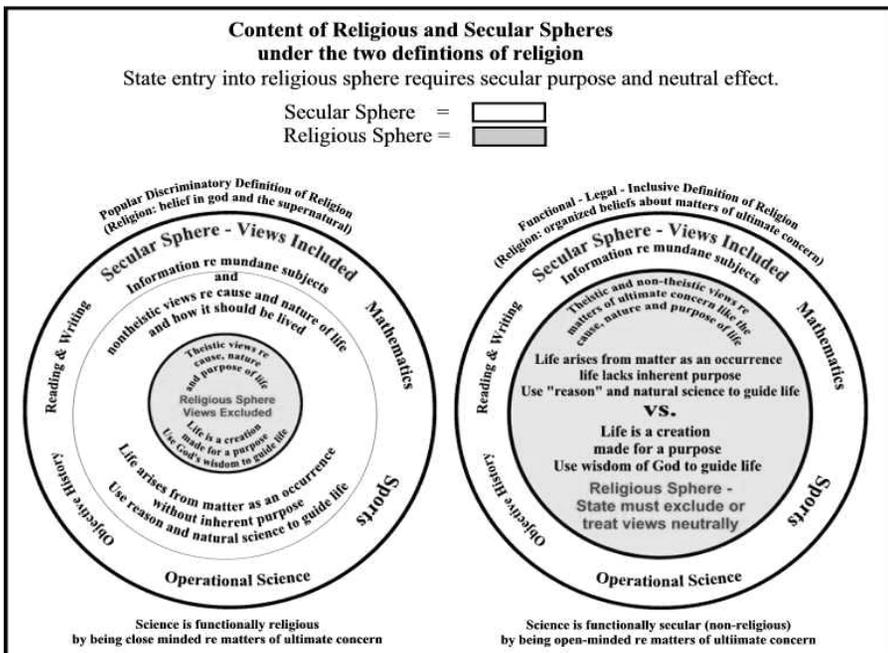


Figure 1: Boundaries of the Religious and Secular Spheres Vary with the Definition of Religion⁵²

49. *Lemon v. Kurtzman*, 403 U.S. 602, 610 (1971).

50. *Epperson v. Arkansas*, 393 U.S. 97, 106-107 (1968) (emphasis added).

51. *Calvert*, *supra* note 5, at 277.

52. *Id.*

IV. IT IS NECESSARY FOR K-12 PUBLIC EDUCATION TO APPLY THE
INCLUSIVE NEUTRAL DEFINITION OF RELIGION

A. *Epperson v. Arkansas Holds That the School has Two Options When its Curricula Touch on the Religious Sphere: Exclude the Religious Issue or Teach it Objectively.*

In *Epperson v. Arkansas*, the State of Arkansas enacted a statute which banned the teaching of evolutionary theory, a materialistic account of origins, in K-12 public schools.⁵³ The Court found that the purpose of the ban was to promote Biblical accounts of origins and was therefore unconstitutional. Importantly, it explained that if the statute had banned all discussion of origins, it would have been constitutional, as being neutral as to religion. The Court explained that a school could enter the religious sphere and teach about religion, but only if the teaching was objective:

While study of *religions* and of the Bible from a literary and historic viewpoint, *presented objectively* as part of a secular program of education, need not collide with the First Amendment's prohibition, *the State may not adopt programs or practices in its public schools or colleges which "aid or oppose" any religion. This prohibition is absolute. It forbids* alike the preference of a religious doctrine or *the prohibition of theory* [teleology] *which is deemed antagonistic to a particular dogma* [the materialistic/atheistic Orthodoxy]. As Mr. Justice Clark stated in *Joseph Burstyn, Inc. v. Wilson*, "the state has no legitimate interest in protecting any or all religions from views distasteful to them . . ."⁵⁴

B. *Religious Subject Matter that Must Be Excluded or Taught Objectively Addresses Ultimate Questions.*

1. The Unconstitutional Theistic Definition of Religion Encourages the Exclusion of Theistic Views and the Inclusion of Non-Theistic Views about Ultimate Questions.

When religion is limited to a belief in God, then it is relatively simple for a school to identify the religious sphere which it must avoid or treat objectively. All it needs to do is look for mention of God or any well-known tenets of the Bible or the Koran. If none of these show up, then the curricula

53. *Epperson v. Arkansas*, 393 U.S. 97, 108-09 (1968).

54. *Id.* at 106-07 (emphasis and bracketed text added) (citations omitted).

is non-religious or secular. If they do show up, then the school has the option of excluding the aspect that makes it theistic or teaching about the theistic view objectively. Since objective teaching is costly and difficult, schools typically exclude from the curriculum any mention of God or the Bible, including its wisdom about how life should be lived ethically and morally.

This paradigm is reflected in numerous judicial decisions since 1940 which have collectively barred the public schools and other governmental facilities from permitting a variety of activities that might appear to endorse theistic religion, including: (a) voluntary Bible studies that occur on school premises before the start of school;⁵⁵ (b) a teacher's silent reading during a study period of the Bible in the view of his English class;⁵⁶ (c) encouraging teachers to provide for a minute of "voluntary prayer or meditation";⁵⁷ (d) a student valedictorian mentioning the student's theistic religious beliefs during her speech;⁵⁸ (e) a kindergartner reading to his class from his "favorite book" if it is a Bible;⁵⁹ (f) a football coach "bending a knee" with his team during their voluntary collective prayer before or during the game;⁶⁰ (g) an invocation to an unnamed God at a high school graduation ceremony;⁶¹ (h) a nativity scene⁶² or (i) a copy of the ten commandments displayed in a public government facility;⁶³ (j) a cross becoming a part of a city logo;⁶⁴ or (k) a cross-shaped memorial to a deceased highway patrolman erected by a private organization in a state highway right of way.⁶⁵

Although the theistic view of religion is excluded in these contexts, the schools typically do not exclude the issue itself. For example, the football coach must still motivate his team to seek an inner strength to defeat the opponent in a grueling contest of wills. However, he simply can't urge them to appeal to a God for that inner strength. Similarly, the issues of where we come from and the nature of life are still included in the science curricula.

55. *Bell v. Little Axe Indep. Sch. Dist. of Cleveland Cty.*, 766 F.2d 1391 (10th Cir. 1985).

56. *Roberts v. Madigan*, 921 F.2d 1047, 1057 (10th Cir. 1990).

57. *Wallace v. Jaffree*, 472 U.S. 38, 70 (1986).

58. David Boroff, Texas High School Valedictorian cut off after mentioning 'God' in graduation speech, *DAILY NEWS* (June 11, 2013) <http://www.nydailynews.com/news/national/valedictorian-cut-mentioning-god-graduation-speech-article-1.1369065>.

59. *Busch v. Marple Newton Sch. Dist.*, 567 F.3d 89 (3d Cir. 2009).

60. *Borden v. School Dist. of East Brunswick*, 523 F.3d 153 (3d Cir. 2008).

61. *Lee v. Weisman*, 505 U.S. 577, 583 (1992).

62. *County of Allegheny v. ACLU Greater Pittsburgh Chapter*, 492 U.S. 573 (1989).

63. *McCreary Cty. v. ACLU of Kentucky*, 545 U.S. 844 (2005).

64. *Robinson v. City of Edmond*, 68 F.3d 1226, 1230 (10th Cir. 1995).

65. *Am. Atheists, Inc. v. Davenport*, 637 F.3d 1095, 1113 (10th Cir. 2010).

However, when students are taught about that issue, all of the evidence which supports belief in a God or any creative mind is excluded and only the evidence which supports materialistic/atheistic religious worldviews is included.

In *Welsh v. United States*, the non-theistic plaintiff had been denied a religious exemption from the draft because the exemption defined religion as only theistic. Justice Harlan in his concurrence explained the discriminatory effect of a theistic definition of religion gerrymandered to exclude non-theistic religious beliefs:

However, having chosen to exempt [due to religious belief], it cannot draw the line between theistic or nontheistic religious beliefs on the one hand and secular beliefs on the other. Any such distinctions are not, in my view, compatible with the Establishment Clause of the First Amendment. . . . The implementation of the neutrality principle of these cases requires, in my view, as I stated in *Walz v. Tax Comm'n, supra*, 'an equal protection mode of analysis. The Court must survey meticulously the circumstances of governmental categories to eliminate, as it were, *religious gerrymanders*. In any particular case the critical question is whether the scope of legislation encircles a class so broad that it can be fairly concluded that [all groups that] could be thought to fall within the natural perimeter [are included].' The 'radius' of this legislation is the conscientiousness with which an individual opposes war in general, yet the statute, as I think it must be construed, *excludes from its 'scope' individuals motivated by teachings of nontheistic religions*, and individuals guided by an inner ethical voice that bespeaks secular and not 'religious' reflection. It not only accords a preference to the 'religious' but also disadvantages adherents of religions that do not worship a Supreme being.⁶⁶

2. The Constitutional Inclusive Definition of Religion Expands the Curricula that Must be Excluded or Treated Objectively.

As explained in the diagram in Section III.B., *supra*, the constitutional religious sphere is not defined by a particular religious belief, rather it is

66. *Welsh v. United States*, 398 U.S. 333, 356-57 (1970) (Harlan J. concurring) (emphasis added); See also *Larson v. Valente*, 456 U.S. 228 (1982); *Texas Monthly, Inc. v. Bullock*, 489 U.S. 1, 17 (1989) ("The Court must survey meticulously the circumstances of governmental categories to eliminate, as it were, religious gerrymanders.") (emphasis and bracketed text added) (citations omitted).

defined by ultimate questions or issues that all religions address. For example, the religious issue involved in *Welsh v. United States*⁶⁷ was one about the sanctity of life. Accordingly, objectivity is required if a religious issue, such as the question of origins or the sanctity of life is retained in the curricula. In *Lemon v. Kurtzman*, the Court recognized that subjects such as “mathematics, modern foreign languages, physical science and physical education” generally do not address ultimate questions.⁶⁸ Notice that the list did not include subjects that seek to explain where we come from, the “nature” of our lives, or subjects arising in health and social sciences that teach about ethical human behavior, human sexuality, family and the sanctity of life. However, all of these subjects are now incorporated in modern K-12 public education.

Accordingly, to determine whether curricula touch the religious sphere, one must know the key issues or questions which all religions address. As explained above they come in a three-tiered hierarchy: (1) What is the cause of the universe, of life and the diversity of life, (2) what is the nature of the universe and life and the purpose of life, if any, and (3) how should life be lived ethically and morally?

K-12 Origins Science generally addresses the first two issues, while health, behavioral and social sciences address the third. These are discussed in more detail below.

V. MODERN ORIGINS SCIENCE IS NOT OBJECTIVE BECAUSE IT IS AN HISTORICAL SCIENCE THAT USES A CONCEALED MATERIALISTIC/ATHEISTIC ORTHODOXY THAT PROHIBITS CONSIDERATION OF SIGNIFICANT EVIDENCE-BASED TELEOLOGICAL ALTERNATIVES

Origins Science is the science that seeks to explain the origin, nature and development of the Universe, of life and the diversity of life. It is often referred to as Cosmological, Chemical and Biological Evolution. Cosmological Evolution is typically covered in curricula about the big bang, and the nature and history of development of the physical universe. Chemical evolution deals with the transition from physical non-life to living systems that operate on functional biological information. Biological evolution deals with the history of the diversity of life from single cell prokaryotes to multicellular organisms of astonishing sophistication and variety. Cosmological, chemical and biological evolution are covered in K-

67. *Id.*

68. *Lemon v. Kurtzman*, 403 U.S. 602, 610 (1971).

12 curricula that deal with biology, geology, astronomy, anthropology and other life and physical sciences.

A. *Modern Institutional Origins Science is Not Necessarily Objective.*

Institutions of science routinely advise students and the public that science is an enterprise that is inherently open-minded and objective. If that is true, then we should expect that explanations of origins developed by those institutions will be objective. If objective, then they should be religiously neutral as the explanations were developed without dogma or preconception and with an open mind. Therefore, can't schools simply take what science has presented and assume it is religiously neutral and objective?

The assertion that "science" is an open-minded enterprise not driven by preconception was expressed by Paul Kurtz, a philosopher and co-author of the Humanist Manifesto II, in his discussion of the difference between science and "religion":

There is a profound difference between science and religion in its conception of truth. Science requires an open mind, free inquiry, critical thinking, the willingness to question assumptions, and peer review. The test of a theory or hypothesis is independent (at least one would hope) of bias, prejudice, faith, or tradition; and it is justified by the evidence, logical consistency, and mathematical coherence.⁶⁹

However, there are at least three reasons modern Institutional Origins Science⁷⁰ does not meet this actually misleading description of science as an objective and open-minded enterprise not driven by preconception.

69. PAUL KURTZ, SCIENCE AND RELIGION: ARE THEY COMPATIBLE? 13 (Paul Kurtz ed., 2003) (emphasis added). Kurtz testified that the belief system he proclaimed in the Humanist Manifesto II was not religious. The Court disagreed and the Eleventh Circuit did not reverse that view. See *Smith v. Bd. of Sch. Comm'rs of Mobile Cty.*, 655 F. Supp. 939, 982 (S.D. Ala. 1987), *rev'd on other grounds*, 827 F.2d 684 (11th Cir. 1987). Religious ("secular") Humanism has been held by four courts, including the *Smith* Court, to be a religion. See *Fellowship of Humanity v. Cty. of Alameda*, 315 P.2d 395 (1957); *Washington Ethical Soc'y v. Dist. of Columbia*, 249 F.2d 127 (D.C. Cir. 1957); *Strayhorn v. Ethical Soc'y of Austin*, 110 S.W.3d 458 (Tex. Ct. App. 2003). The Supreme Court recognized it to be a religion in *Torcaso v. Watkins*, 81 S. Ct. 1680 (1961).

70. I use the phrase "Institutional Origins Science," to refer to the way origins science is conducted by the major institutions of science in the U.S., including the NAS, the AAAS and the NSTA. That method of conduct does not necessarily define what science actually is. Many scientists eschew the Orthodoxy and believe it to be not scientific. The two descriptions of science by Kurtz, *supra*, and Lewontin (*infra* at V.B.1.a.) show that conflict.

B. *There Are at Least Three Reasons Modern Origins Science Is Not in Fact Objective: (1) Its Investigation and Explanations Are Determined by the Orthodoxy of Methodological Naturalism and Not by an Objective Weighing of the Relevant Evidence, (2) Due to the Orthodoxy, It Violates the Logic Necessary for the Conduct of the Historical Science it Is, and (3) Because the Use and Effect of Use of the Orthodoxy is Generally Concealed.*

1. Modern Origins Science Is Not Objective as It Is Guided by a Materialistic/Atheistic Orthodoxy and Not by a Weighing of the Available Relevant Evidence.
 - a. Methodological naturalism.

The first reason that modern institutions of science are not objective when they conduct Origins Science is because they actually employ the Orthodoxy of methodological naturalism. The Orthodoxy is also called scientific materialism or “mechanism.”⁷¹

The Orthodoxy requires one to assume that the apparent design of many natural objects and systems is just an illusion, and that all natural phenomena are due solely to the interactions of matter, energy and the forces per the laws of chemistry and physics, without any intervening intelligence. As a consequence, when one commences to investigate the cause of a past event, one must assume at the outset that it was due to the random interactions of matter, energy and forces per the laws of physics and chemistry. This tunnel vision requires that the explanations for the cause of the universe and life be materialistic/atheistic, regardless of any evidence that an intelligent cause might be involved. Thus, the Orthodoxy mandates that only the evidence which supports the materialistic dogma be put on the scales. Evidence which supports the competing teleological explanation must be excluded. Accordingly, the Orthodoxy precludes a weighing of all the relevant evidence.

The existence and absolute nature of the Orthodoxy was explained by evolutionary biologist Richard Lewontin:

[W]e have a prior commitment, a commitment to materialism. It is not that the methods and institutions of science somehow

71. “[M]echanism . . . a doctrine that holds natural processes (as of life) to be mechanically determined and capable of complete explanation by the laws of physics and chemistry.” MERRIAM-WEBSTER UNABRIDGED DICTIONARY (2018), *available at* https://www.google.com/search?source=hp&ei=lytuWoONG4ezzwLJw7WICg&q=mechanism+definition&oq=mechanism&gs_l=psy-b.1.1.0l10.1942.3981.0.7276.9.6.0.3.3.0.155.712.0j6.6.0....0...1c.1.64.psy-ab..0.9.758...0i131k1.0.hhNSakuG534 (last visited Jan. 1, 2018).

compel us to accept a material explanation of the phenomenal world, but, on the contrary, that we are forced by our *a priori* adherence to material causes to create *an apparatus of investigation and a set of concepts that produce material explanations, no matter how counter-intuitive, no matter how mystifying to the uninitiated. Moreover, that materialism is absolute, for we cannot allow a Divine Foot in the door.*⁷²

The author of many K-12 biology textbooks, Kenneth Miller, describes the Orthodoxy as an “assumption” based on a “considerable leap of faith,” which goes by many names, but I propose we call it “scientific materialism.” Scientific materialism assumes that the objects and events of the natural world can be explained in terms of their material properties. . . . *It’s true that scientific materialism makes a considerable leap of faith.* At its core is the belief that natural phenomena can be explained by material causes.⁷³

Use of the Orthodoxy by modern institutions of science to suppress both evidence and mention of the teleological alternative and to suppress legitimate criticisms of evolutionary theory in public education is documented in the *Kitzmiller* case which is thoroughly discussed in *Kitzmiller’s Error*.⁷⁴

The Orthodoxy is also vigorously enforced. In the past twenty years, many scientists who eschew the Orthodoxy have been effectively excommunicated from institutions of science and education. A 2008 film that documents the strategy employed to enforce the Orthodoxy is *Expelled: No Intelligence Allowed*, starring Ben Stein. The film uses the metaphor of the former Berlin Wall to illustrate the way the Orthodoxy is protected in the scientific community. Those who don’t follow the Orthodoxy are excommunicated,

72. Richard C. Lewontin, *Billions and Billions of Demons*, 44 N.Y. REV. BOOKS (1997) (reviewing CARL SAGAN, *THE DEMON-HAUNTED WORLD: SCIENCE AS A CANDLE IN THE DARK* (1997)) (second emphasis added).

73. KENNETH R. MILLER, *FINDING DARWIN’S GOD: A SCIENTIST’S SEARCH FOR COMMON GROUND BETWEEN GOD AND EVOLUTION* 27 (1999) (emphasis added).

74. See Calvert, *supra* note 5 (In *Kitzmiller v. Dover Area Sch. Dist.*, 400 F. Supp. 2d 707, 735 (M.D. Pa. 2005), Judge Jones described the Orthodoxy as a “self-imposed convention of science, which limits inquiry to testable, natural explanations about the natural world . . . [that] is sometimes known as the scientific method. Methodological naturalism is a ‘ground rule’ of science today which requires scientists to seek explanations in the world around us based upon what we can observe, test, replicate, and verify.”) (internal citations omitted). As explained in *Kitzmiller’s Error*, the Orthodoxy is not in fact embodied in the scientific method, rather it is in conflict with it. Jones’ misleading description conceals the true nature of the Orthodoxy while acknowledging its foundational status.

persecuted, and exiled from the academic and scientific community. One of the persecuted, biologist Jerry Bergman, Ph.D., chronicles the “Slaughter of the Dissidents.”⁷⁵ A more recent book by bioengineer and former dean of the Chemistry and Medical Sciences at Helsinki University and Technology, Matti Leisola, DSc, exhaustively details the pervasive nature of the discrimination: *Heretic: One Scientist’s Journey from Darwin to Design*:

Swimming against the current isn’t easy, of course. My own voyage away from the materialistic evolutionary faith was long and painstaking. In this book, I describe that journey. I also detail the evasions, hatred, suspicions, contempt, fear, power games, and persecution that face scientists who oppose the evolutionary paradigm and the naturalistic worldview behind it.⁷⁶

The Orthodoxy is not only applied against teleologists, but also against materialists who question the adequacy of the standard materialistic explanation that all of the diversity of life is due to random mutations and natural selection.⁷⁷

b. The orthodoxy is not supported by the available evidence and the case is not closed.

(1) The available evidence includes observable evidence that supports a logical inference to intelligent causation.

If there were no observable evidence that contradicted the Orthodoxy’s ban of any intelligent cause, then its use might be plausible. That is normally the case when studying purely physical systems. One does not postulate an intervening mind to explain why an apple falls to the ground when its stem

75. JERRY BERGMAN, *SLAUGHTER OF THE DISSIDENTS: THE SHOCKING TRUTH ABOUT KILLING THE CAREERS OF DARWIN DOUBTERS* 25-27 (2008); *VOLUME II* (2016) AND *VOLUME III* (2018)

76. MATTI LEISOLA & JONATHAN WITT, *HERETIC: ONE SCIENTIST’S JOURNEY FROM DARWIN TO DESIGN* 14 (2018).

77. SUZAN MAZUR, *THE ALTENBERG 16: AN EXPOSÉ OF THE EVOLUTION INDUSTRY* 317 (2010). In Suzan Mazur’s interview of cognitive scientist, Massimo Piattelli-Palmarini, of the University of Arizona, Palmarini said: “[E]ven if we take the many, many biologists in many countries who have contributed to the new rich panorama we have today of non-selectionist biological mechanisms . . . they are reluctant, in my opinion, to steer away from natural selection. . . I think that abandoning Darwinism (or explicitly relegating it where it belongs, in the refinement and tuning of existing forms) sounds anti-scientific. They fear that the tenants of intelligent design and the creationists (people I hate as much as they do) will rejoice and quote them as being on their side. They really fear that.” *Id.*

breaks. Experimental evidence shows that the apple is actually pulled to the ground by the force of gravity.

However, a different question arises when one moves from physics to historical biology and asks, “What is the nature of the apparently designed apple and where did it come from?” We are now dealing with living systems that run on complex functional information of incomprehensible sophistication. We are not dealing with purely physical systems governed entirely by the laws of physics and chemistry. The aperiodic sequence of the four nucleotide bases that carry much of the information in the genome of an organism is not determined by physics and chemistry. This is because any of the four bases may occupy any position along the strands of DNA.⁷⁸ Richard Dawkins put it this way: “Biology is the study of complicated things that give the appearance of having been designed for a purpose [because they run on programmed functional information]. Physics is the study of simple things that do not tempt us to invoke design [because they are ordered by the laws of physics and chemistry].”⁷⁹

Physics and chemistry may explain the hardware of life, but do not explain the software – the information processing systems that direct the assembly of the hardware. In the real world, information processing systems are made only by minds. Thus, when one observes information processing systems in life one finds evidence that supports an inference that a mind of some sort might be involved. The study of the design inference that logically arises from the observation is called teleology.⁸⁰

Humans have studied teleology or intelligent design in nature since the beginning of civilization.⁸¹ This is because a logical inference to an intelligent cause arises when one observes a natural pattern that exhibits a forward looking apparent purpose, end, or function, which is independent of each of the characteristics of the elements that make up the pattern.⁸² Socrates inferred design when he compared the function of the human eye with the function of the furniture in his office. He attributed both to the mind of a craftsman.⁸³ The previous sentence is a pattern consisting of a string of

78. Calvert, *supra* note 5, at 226-27.

79. RICHARD DAWKINS, *THE BLIND WATCHMAKER: WHY THE EVIDENCE OF EVOLUTION REVEALS A UNIVERSE WITHOUT DESIGN*, 4 (1996) (bracketed text added).

80. See *supra* text accompanying note 3.

81. Calvert, *supra* note 5, at 224.

82. WILLIAM A. DEMBSKI, *THE DESIGN INFERENCE: ELIMINATING CHANCE THROUGH SMALL PROBABILITIES* 33, 47 (1998). For a more rigorous discussion of these concepts, see WILLIAM A. DEMBSKI, *NO FREE LUNCH: WHY SPECIFIED COMPLEXITY CANNOT BE PURCHASED WITHOUT INTELLIGENCE* 12-13 (2007).

83. DAVID SEDLEY, *CREATIONISM AND ITS CRITICS IN ANTIQUITY* 81 (2007).

characters. Each individual letter has no independent meaning or significance. However, the integration of all produces a meaning or message. That meaning is independent of the significance of each of the letters and spaces in the pattern. If someone found the sentence drawn in the sand on a beach, one would logically infer that the pattern has an apparent purpose or function that was caused by the activity of a mind. The inference arises because purpose or meaning only derives from a mind or some form of intelligence with foreknowledge. Only a mind can “choose” or “select” a future purpose and then direct output to accomplish it. Matter, energy and the forces, lacking a mind, cannot produce real purpose or ends. However, as discussed in V.B.1.b.(2) below, their apparent fine-tuning for life during the big bang does reflect an apparent purpose for their particular characteristics.

An appearance of design, however, does not establish that the pattern is actually designed. The apparent design might be explained by chance or some natural necessity, in which case the appearance may be a mere illusion of design. For example, a Coroner may find a body with an arrow in the heart but later during an autopsy conclude that the death occurred a day earlier due to a natural heart attack. So, to establish intelligence or agency as an inference to the best explanation, the evidence must not only show an apparent purpose or function, but it must also show that the pattern cannot be adequately explained by chance and or necessity - natural or material causes.

An example of a natural illusion of design is the beautiful pattern of a snowflake. It looks exquisitely designed. However, on close examination one finds that its pattern is due to the peculiar chemical and physical characteristics of hydrogen and oxygen atoms when water is subjected to certain conditions of temperature and pressure. Under the right conditions the chemical and physical properties of the atoms cause them to self-organize into hexagonal lattices. The chance arrangement of the hexagons produces patterns having beautiful hexagonal symmetry.

The abductive logic used to justify an inference to design is articulated by philosopher and mathematician William Dembski in *The Design Inference and No Free Lunch*.⁸⁴ Dembski explains the three-step process for detecting design using an “explanatory filter.” The filter first asks if a given pattern appears to have a purpose or function or appears to be functional or specified.” If it appears functional, then the filter seeks to determine if the appearance of design is necessary due to some law or regularity? If the laws of physics and chemistry can explain the pattern, as in the case of the

84. WILLIAM A. DEMBSKI, *THE DESIGN INFERENCE* 33, 47 (1998). For a more rigorous discussion of these concepts, see WILLIAM A. DEMBSKI, *NO FREE LUNCH* 12-13 (2007).

snowflake, then one need go no further, and the claim of illusion is supported. However, if laws do not explain the pattern, as is the case with the aperiodic sequences of bases in DNA, then perhaps the apparently designed pattern is due to random or stochastic processes.

If the pattern is simple, perhaps consisting of only a few elements that could plausibly come together by chance, then chance may plausibly explain it and the claim of illusion may be supported. However, if the apparently specified pattern consists of a complex series of integrated elements, as in the case of this sentence that cannot be adequately explained by random processes—if it exhibits “functional complexity,” then an inference of design from the observed evidence is warranted and the claim of illusion remains unsupported.

As explained in Section V.B.2, *infra*, the explanatory filter is a form of abductive reasoning used in historical science to find the best of competing explanations.

The scientific search for an intelligent or teleological cause for a pattern is most frequently used in forensic science. That science asks whether a given pattern, as in the case of one resulting from a death, was due to an intention (homicide or suicide), some necessary or natural cause (heart attack), or chance or accident (such as an auto accident). Thus, the coroner considers four possible hypotheses: intelligent, natural, accidental, or cause unknown—case not closed. To decide on one of the first three, one must find evidence that will do two things—rule in one hypothesis while ruling out the other two. As explained in Section V.B.2 *infra* in the discussion of the use of abductive reasoning in historical science, if the evidence is consistent with two or more of the hypotheses, then it proves neither. The forensic scientist is looking for an inference to the best of the competing explanations.

The living natural world is replete with available evidence that supports the teleological inference. This includes the extremely complex aperiodic sequences of the four nucleotide bases in DNA. However, when the Orthodoxy is employed the investigator must ignore that evidence and develop imaginative narratives that explain only with a combination of chance and necessity (physics and chemistry). Even cause unknown is not allowed as the Orthodoxy mandates that the cause be an unintelligent material cause.

This was explained by Jacques Monod, in his famous book *Chance and Necessity*. Because teleology is not allowed, random changes in the genome “constitute *the only possible* source of” “every *innovation* of all *creation* in the

biosphere.”⁸⁵ Interestingly, in honoring his commitment to materialism Monod masks its inadequacy by using teleological descriptors to label the changes (“innovations”) and the product (“all creation”).⁸⁶ The inadequacy of the chance hypothesis to explain the origin of the software of life is discussed in V.B.1.b.(3) and (4), *infra*.

- (2) The materialistic premise of the Orthodoxy that the physics and chemistry of existing matter, energy and the forces explain all natural events is inconsistent with the facts that (a) the origin of the Universe preceded and gave birth to that physics and chemistry and (b) because that origin has been found to be “fine-tuned” or designed for life.

The following very generally outlines observable evidence which contradicts the materialistic Orthodoxy and supports a teleological inference for the origin of the universe and its physics and chemistry.

- (a) Our universe had a beginning that gave rise to the laws of physics and chemistry, and therefore physics and chemistry do not explain the origin of the cosmos.

The Orthodoxy was born on the assumption that the universe and its matter, energy and the forces—its physics and chemistry—have always been self-existing and infinite. This was the foundation for Epicureanism, an ancient non-theistic religion similar to Religious (“Secular”) Humanism. It was based on the idea of Democritus that given an infinite universe, the unique characteristics of atoms would eventually self-organize via a kind of natural selection into humans.⁸⁷ With an infinite universe, chance has the probabilistic resources to explain anything.

85. JACQUES’ MONOD, CHANCE AND NECESSITY 112-13 (1971). As Jacques Monod explains, “[w]e call these [mutations] accidental; we say that they are random occurrences. And since they constitute the *only* possible source of modifications in the genetic text, itself the *sole* repository of the organism’s hereditary structures, it necessarily follows that chance *alone* is at the source of every innovation, of all creation in the biosphere. Pure chance, absolutely free but blind, at the very root of the stupendous edifice of evolution: this central concept of modern biology is no longer one among other possible or even conceivable hypotheses. It is today the *sole* conceivable hypothesis.” *Id.* (bracketed text added)

86. Innovation is defined as “the introduction of something new: the act or an instance of innovating.” MERRIAM-WEBSTER’S UNABRIDGED DICTIONARY (2018). Minds *introduce* while random changes in matter just *occur*. The random changes Monod is describing are *occurrences*, not innovations. The use of unintended teleological descriptors is ubiquitous in the descriptions of modern life science. See *infra* text accompanying note 244.

87. See Calvert, *supra* note 5, at 224.

However, in the early twentieth century astronomers found that our universe is finite, not infinite. It arose from a “big bang” that occurred some fourteen billion years ago. This is based on observations that our universe is expanding in all directions and the “cosmic microwave background radiation [consisting of] the cooled residue of the primeval fireball that constituted the early universe.”⁸⁸ That evidence suggests that matter, energy, the four fundamental forces and their physics and chemistry arose from an incredibly dense golf-ball sized store of energy during the first few microseconds of the “bang.”⁸⁹

Since the Orthodoxy assumes that the resulting physics and chemistry explain everything, it necessarily does not explain the “bang” that caused the physics and chemistry to come into being. Thus, the cause of the bang and the resulting physics and chemistry is not explained by physics and chemistry.

Accordingly, only chance remains to explain the physics and chemistry materialistically. In an infinite universe, chance might be sufficient as anything can be plausibly explained when infinity is placed in the numerator of the probability equation. However, as described in the following subsection, chance is implausible as the physics and chemistry appear to be “fine-tuned for life.”

- (b) The orthodoxy cannot plausibly explain the laws of physics and chemistry that came into being in a microsecond as a chance occurrence, because the matter, energy and forces they describe reflect functional complexity that is extremely fine-tuned or designed for life.

The Orthodoxy cannot explain the origin of the universe and its physics and chemistry as a chance event, as they are exquisitely “fine-tuned” for life.⁹⁰

88. JOSEPH SILK, *THE BIG BANG* 75 (3d ed. 2000). (bracketed text added)

89. “Enormous energies were achieved at these early moments and resulted in the creation of matter out of almost nothing; that is, out of energy.” *Id.* at 107.

90. Luke A Barnes, *The Fine-Tuning of the Universe for Intelligent Life*, 29 PUB. ASTRONOMICAL SOC’Y AUSTRAL. 529 (2012), <http://arxiv.org/abs/1112.4647>. Barnes provides a review of the scientific literature regarding the view showing that it is one held by a preponderance of the scientific community. The paper also critiques the dissenting view of Victor Stenger that the universe is not fine-tuned:

The reason why FT [Fine Tuning] is an interesting claim is that it makes the existence of life in this universe appear to be something remarkable, something in need of explanation. The intuition here is that, if ours were the only universe, and if the causes that established the physics of our universe were indifferent to

The fact of the fine-tuning is based on the conclusions of a number of cosmologists⁹¹ that the values that describe the properties of matter, energy, and the forces that give rise to the laws of physics and chemistry that emerged from the big bang are such that if any were changed by a slight amount, life on earth would not exist.⁹²

For example, the value of the strength of gravity is a specific number within a practically infinite range of possible strengths. The same is true of the electromagnetic and strong and weak nuclear forces and a number of other constants that determine the structure of matter and of the universe. If any one of these values or free parameters were different by a slight amount, life would not exist.⁹³ Furthermore, the values appear arbitrary—they are not chemically or physically necessary—and are not plausibly explained by chance.⁹⁴ As explained by Francis Collins, the former head of the Human

whether it would evolve life, then the chances of hitting upon a life-permitting universe are very small.

Id. at 529. He then shows two principal competing explanations. The materialistic explanation is:

This universe is one of a large number of variegated universes, produced by physical processes that randomly scan through (a subset of) the set of possible physics. Eventually, a universe will be created that is a member of the life-permitting set. Only such universes can be observed, since only such universes contain observers.

Id. at 530. The teleological is: “There exists a transcendent, personal creator of the universe. This entity desires to create a universe in which other minds will be able to form. Thus, the entity chooses from the set of possibilities a universe which is foreseen to evolve intelligent life.” *Id.*

91. *Id.* Barnes catalogues the scientists who believe the universe is fine-tuned in explaining that Stenger is one of few that deny the observation:

Let’s be clear on the task that Stenger has set for himself. There are a great many scientists, of varying religious persuasions, who accept that the universe is fine-tuned for life, e.g. Barrow, Carr, Carter, Davies, Dawkins, Deutsch, Ellis, Greene, Guth, Harrison, Hawking, Linde, Page, Penrose, Polkinghorne, Rees, Sandage, Smolin, Susskind, Tegmark, Tipler, Vilenkin, Weinberg, Wheeler, Wilczek. They differ, of course, on what conclusion we should draw from this fact. Stenger, on the other hand, claims that the universe is not fine-tuned.

Id. at 6-7.

92. Tim Folger, *Science’s Alternative to an Intelligent Creator: the Multiverse Theory*, DISCOVER, Nov. 10, 2008, <http://discovermagazine.com/2008/dec/10-sciences-alternative-to-an-intelligent-creator> (last visited Mar. 27, 2018) (“Our universe is perfectly tailored for life. That may be the work of God or the result of our universe being one of many.”).

93. GERAINT LEWIS & LUKE BARNES, *A FORTUNATE UNIVERSE: LIFE IN A FINELY TUNED COSMOS* 63 (2016).

94. MARTIN REES, *JUST SIX NUMBERS: THE DEEP FORCES THAT SHAPE THE UNIVERSE*, 148-49 (“I’m impressed by a metaphor given by the Canadian philosopher, John Leslie. Suppose you are facing a firing squad. Fifty *marksmen* take aim, but *they all miss*. If they hadn’t all missed

Genome project, this data produces a compelling logical inference that material causes and the universe itself are created to enable life.⁹⁵ This logical and evidence-based inference to a fine-tuned universe undermines the materialistic Orthodoxy while supporting the teleological alternative that life itself is the purpose and reason for the universe and its laws of chemistry and physics.

Two astrophysicists, one a non-theist and the other a theist, published an extraordinary book in 2016 about our fine-tuned universe, *A Fortunate Universe: Life in a Finely Tuned Cosmos*.⁹⁶ Both scientists agree that the data show that the universe is “fine-tuned” for life. They devote most of the book to explain all the evidence for that conclusion. At the end, they get into a debate over “why” it is fine-tuned. The debate then turns religious.

Martin Rees, an astrophysicist explains in *Just Six Numbers: The Deep Forces that Shape the Universe* how it is that just six numbers, imprinted in the ‘big bang’ determine the essential features of the physical cosmos. Moreover, cosmic evolution is astonishingly sensitive to the value of these numbers. “[I]f any one of them were to be ‘untuned’, there could be no stars and no life This realization offers a radically new perspective on our universe, on our place in it, and on the nature of physical laws.”⁹⁷ It suggests that the universe may be due to an intelligent cause, an inference also recognized by Francis Collins, a geneticist who headed up the Human Genome Project, and physicist Paul Davies, the Director of BEYOND: Center for Fundamental Concepts in Science.⁹⁸

you wouldn’t have survived to ponder the matter. But you wouldn’t just leave it at that – you’d still be baffled, and would seek some further reason [other than chance] for your good fortune.”) (emphasis and bracketed text added).

95. Many scientists, including Francis Collins, the head of the human genome project, find the data imply that the universe is “fine-tuned” for life and therefore is a design. See FRANCIS S. COLLINS, *THE LANGUAGE OF GOD: A SCIENTIST PRESENTS EVIDENCE FOR BELIEF* 75 (2006). See also GUILLERMO GONZALEZ & JAY RICHARDS, *THE PRIVILEGED PLANET* 195-218 (2004); MARTIN REES, *JUST SIX NUMBERS: THE DEEP FORCES THAT SHAPE THE UNIVERSE* 146-48 (2001) (Martin Rees recognizes the inference, but does not prefer it.); PAUL DAVIES, *GOD AND THE NEW PHYSICS* 189 (1983) (“[T]he seemingly miraculous concurrence of numerical values that nature has assigned to her fundamental constants must remain the most compelling evidence for an element of cosmic design.”).

96. GERAINT LEWIS & LUKE BARNES, *A FORTUNATE UNIVERSE: LIFE IN A FINELY TUNED COSMOS* (2016).

97. MARTIN REES, *JUST SIX NUMBERS: THE DEEP FORCES THAT SHAPE THE UNIVERSE* 4 (2000).

98. FRANCIS S. COLLINS, *THE LANGUAGE OF GOD: A SCIENTIST PRESENTS EVIDENCE FOR BELIEF* 75 (2006); PAUL DAVIES, *GOD AND THE NEW PHYSICS* 189 (1983).

A recently developed competing materialistic hypothesis is that an infinite number of universes exist external to this universe. It is argued that these infinite probabilistic resources render a fortuitous occurrence of this hospitable universe plausible. However, there appears to be no way to test the multiverse hypothesis as there appears to be no theoretical possibility of observing these imagined parallel universes from within our universe.⁹⁹ Theoretical Physicist Sabine Hossenfelder labels the idea as “madness” not “based on sound scientific reasoning.”¹⁰⁰ Physicist Peter Woit, explains that “the problem with the multiverse is that it’s an empty idea, predicting nothing. It is functioning not as what we would like from science, a testable explanation, but as an untestable excuse for not being able to predict anything.”¹⁰¹

The two competing ideas are supported by the logic that something - i.e. the universe - cannot come from nothing, because something cannot come from nothing. For the teleologist the something is an evidence-based inference to an intelligent cause. For the materialist, the something is an infinite array of unobservable imagined other universes. But, both the materialist and the teleologist ask the other, well where did that source of intelligence or (parallel universes) come from? Both are caught in an infinite regression. Certainly, as a matter of science we simply do not have an answer to the question. The scientific case is not closed and likely will never be closed.¹⁰² This properly leaves it up to the individual, in a truly secular state, to choose a religion that he or she believes provides the best of the competing explanations.

In conclusion, the cause of the big bang and the cause of the matter, energy, and forces, as well as the physics and chemistry that emerged from it – the material or natural causes themselves – are essentially unknown,

99. Tim Folger, *Science's Alternative to an Intelligent Creator: The Multiverse Theory*, DISCOVER (Nov. 10, 2008), <http://discovermagazine.com/2008/dec/10-sciences-alternative-to-an-intelligent-creator> (“[o]ur universe is perfectly tailored for life. That may be the work of God or the result of our universe being one of many”).

100. Sabine Hossenfelder, *Scientific Theory and The Multiverse Madness*, NPR (Jan. 22, 2018), <https://www.npr.org/sections/13.7/2018/01/22/579666359/scientific-theory-and-the-multiverse-madness>; Sabine Hossenfelder, *More Multiverse Madness*, BACKREACTION (Jan. 25, 2018, 11:40 AM), <http://backreaction.blogspot.com/2018/01/more-multiverse-madness.html>.

101. Peter Woit, *Beyond Falsifiability*, NOT EVEN WRONG (Jan. 17, 2018), <http://www.math.columbia.edu/~woit/wordpress/?p=9938>.

102. Ross Pomeroy, *We'll Never Know for Sure How Everything Began*, REAL CLEAR SCI. (Mar. 19, 2018); https://www.realclearscience.com/blog/2018/03/19/well_never_know_for_sure_how_everything_began.html.

although they do appear *prima facie* fine-tuned or designed for life.¹⁰³ As a consequence, the observable evidence relating to the origin of the universe and its fine-tuned physics and chemistry does not support the materialistic claim of the Orthodoxy but does provide support for the banned teleological alternative.

- (3) The available evidence regarding the cause of life is inconsistent with the orthodoxy but consistent with the teleological alternative.

The Orthodoxy mandates a materialistic explanation for the origin of life, yet no coherent plausible idea has been suggested to explain how that could have happened. The issue is explained in detail in *Kitzmiller's Error*,¹⁰⁴ published in 2009. Nine years later, the case for a materialistic origin of life is worse. Origin of life expert Steven A. Benner, PhD explains in a paper presented at a 2015 conference on the origin of life five “paradoxes,’ pairs of statements, both grounded in theory and observation, that (taken together) suggest that the ‘*origins problem*’ cannot be solved.”¹⁰⁵

But what is the “*origins problem*”? The problem is that the lack of any materialistic explanation for the origin of life contradicts the Orthodoxy. According to Benner the origin of life is “magical.”¹⁰⁶ The five paradoxes are:

- (a) The Asphalt Paradox: An enormous amount of empirical data has established, as a rule, that organic systems, given energy and left to themselves, *devolve to give uselessly complex mixtures, “asphalts”* Conversely, the literature reports (to our knowledge) exactly zero confirmed observations where RIRI evolution [replication involving replicable imperfections] emerged spontaneously from a devolving chemical system. Further, chemical theories, including the second law of thermodynamics, bonding theory that describes the “space” accessible to sets of atoms, and structure theory requiring that

103. Paul Davies explains that there is no known cause for the laws. See Paul Davies, *Taking Science on Faith*, N.Y. TIMES, (Nov. 24, 2007), <http://www.nytimes.com/2007/11/24/opinion/24davies.html>; see also GERAINT F. LEWIS AND LUKE A. BARNES, A FORTUNATE UNIVERSE: LIFE IN A FINELY TUNED COSMOS, 334-37 (2016).

104. Calvert, *supra* note 5, at 226-30.

105. Steven A. Benner, *Paradoxes in the Origin of Life*, 44 ORIGINS OF LIFE AND EVOLUTION OF BIOSPHERES 339, 339 (2014) (emphasis added).

106. *Id.* at 343 (emphasis added); see also *id.* (“Thus, even if we solve the asphalt paradox, the water paradox, the information need paradox, and the single biopolymer paradox, we still must mitigate or set aside chemical theory that makes destruction, not biology, the natural outcome of [our] already magical chemical system.”).

replication systems occupy only tiny fractions of that space, *suggest that it is impossible for any non-living chemical system to escape devolution to enter into the Darwinian world of the "living."*

....

(b) The Water Paradox: Water is commonly viewed as essential for life, and theories of water are well known to support this as a requirement. So are biopolymers, like RNA, DNA and proteins. However, these biopolymers are corroded by water . . . life seems to need a substance (water) that is inherently toxic to polymers (e.g. RNA) necessary for life.

(c) The Information-Need Paradox: Theory can estimate the amount of information required for a chemical system to gain access to replication with imperfections that are themselves replicable. These estimates vary widely. However, by any current theory, *biopolymers that might plausibly support RIRI evolution are too long to have arisen spontaneously* from the amounts of building blocks that might plausibly (again by theory) have escaped asphaltic devolution in water . . . *These propositions from theory and observation also force the conclusion that the emergence of (in this case, biopolymer-based) life is impossible.*

(d) The Single Biopolymer Paradox: Even if we can make biopolymers prebiotically, it is hard to imagine making two or three (DNA, RNA, proteins) at the same time. . . .

(e) The Probability Paradox: . . . [E]xperiments show that RNA molecules that catalyze the *destruction* of RNA are more likely to arise in a pool of random (with respect to fitness) sequences than RNA molecules that catalyze the *replication* of RNA, with or without imperfections. . . . Thus, even if we solve the asphalt paradox, the water paradox, the information need paradox, and the single biopolymer paradox, we still must mitigate or set aside chemical theory that makes destruction, not biology, the natural outcome of are [sic] already magical chemical system.¹⁰⁷

The key problem with a materialistic hypothesis for the origin of life is that, unlike purely physical systems that are explained by physics and

107. *Id.* (emphasis and bracketed text added) (internal citations omitted).

chemistry, life runs on functionally complex information systems that process “messages” in DNA that consist of coded sequences of four nucleotide bases. The code employed is very similar to the Morse code, created by the mind of Samuel Morse. The Morse Code uses dots, dashes and spaces to specify particular letters and punctuation marks in a language. Similarly, every three bases in a coded sequence of DNA specifies for one of twenty amino acids or a stop code. After being copied and error checked, the “messages” are then edited into one of numerous possible variants. The final message is then conveyed to one of millions of ribosomes in the cell’s cytoplasm.¹⁰⁸ The ribosome translates the messages into a string of amino acids which are then folded into a specific three-dimensional shape that serves as a catalyst or building block for a functional part of the organism. The genome of the simplest free-living organism is *mycoplasma genitalium*, with 580,000 base pairs and 482 protein-coding genes.

The problem for the materialistic Orthodoxy is that the sequence of the bases that make the messages, just like the arrangement of dots and dashes in a Morse code sequence, is not ordered by physics and chemistry. This means that the sequence is not ordered by a material cause *unless the sequence can be explained by chance*.

However, as explained by Benner’s “Information Paradox,” “biopolymers that might plausibly support Darwinian evolution are too long to have arisen spontaneously” by chance. For example, the average length of a gene sequence is approximately 900 bases for a single celled bacteria and 9,000 for a human.¹⁰⁹ Since the sequence is not dictated by physics and chemistry the number of possible sequences for any one average sized bacterial gene is 4^{900} or 10^{540} . As a comparison, William Dembski and others calculate that the total number of interactions that have ever occurred in the known universe, assuming it is a billion times twenty billion years old, is 10^{150} .¹¹⁰ Thus the probability of a specific sequence occurring by chance with billions of years of trials is roughly $10^{150} / 10^{540} = 1/10^{390}$ or essentially nil in this universe.

108. “Ribosomes are found ‘free’ in the cytoplasm or bound to the endoplasmic reticulum (ER) to form rough ER. In a mammalian cell there can be as many as ten million ribosomes.” *Ribosome*, BRITISH SOC’Y FOR CELL BIOLOGY, <http://bscb.org/learning-resources/softcell-e-learning/ribosome/> (last visited Mar. 27, 2018).

109. THE AVERAGE LENGTH OF A TYPICAL GENE OF A GRAM NEGATIVE BACTERIA IS 900 BASE PAIRS. BENJAMIN LEWIN, *BACTERIAL GENE NUMBERS RANGE OVER AN ORDER OF MAGNITUDE*, CELLS, [HTTP://BIOSCIENCE.JBPUB.COM/CELLS/MBIO137.ASPX](http://bioscience.jpup.com/cells/MBIO137.aspx) (LAST VISITED APR. 7, 2018). IN COMPARISON THE AVERAGE LENGTH OF A HUMAN GENE IS 8,446 BASE PAIRS. NICLAS JAREBORG ET AL., *COMPARATIVE ANALYSIS OF NONCODING REGIONS OF 77 ORTHOLOGOUS MOUSE AND HUMAN GENE PAIRS*, 9 *GENOME RESEARCH* 815, 826.

110. WILLIAM A. DEMBSKI, *NO FREE LUNCH: WHY SPECIFIED COMPLEXITY CANNOT BE PURCHASED WITHOUT INTELLIGENCE* 21-22 (2007).

Furthermore, origins of life research indicate that the minimal number of protein coding genes necessary for replicating life is around 300. Thus, as explained by Benner's paradoxes, a spontaneous emergence of life by chance is seemingly "impossible." Hubert Yockey, a famous physicist and information theorist has calculated the odds of the chance formation of life at $1/10^{186,000}$.¹¹¹

Although there is no evidence of a material cause for life, the awesomely complex information processing systems observed to be necessary for life provide significant objective observable evidence that supports the teleological alternative. This evidence includes a genetic code that exhibits "Eerie Perfection." In *Life's Solution: Inevitable Humans in a Lonely Universe*, paleontologist geologist Simon Conway Morris devotes a sub-chapter to the extraordinary efficiency of a Genetic Code described as "one in a million," which he calls "Eerie Perfection."¹¹²

Origin of life expert Andrew Knoll has said that humans are basically ignorant as to any natural cause for the origin of life itself.¹¹³ One organization posted a one million dollar origin of life prize for the first scientist to develop a plausible natural process mechanism for a chemical origin of life.¹¹⁴ The prize has yet to be claimed. In 2013, origin of life expert Sara Walker was asked by Suzan Mazur: "So all three questions are still up in the air—when, where and how." Her answer: "Yes. We definitely are still up in the air in the origins of life investigation."¹¹⁵ In 1998 origins of life expert

111. Hubert P. Yockey, *Calculating Evolution*, in 3 COSMIC PURSUIT: IN PURSUIT OF LIFE'S BIG QUESTIONS 28 (2003).

112. SIMON CONWAY MORRIS, *LIFE'S SOLUTION: INEVITABLE HUMANS IN A LONELY UNIVERSE* 13 (2003).

113. NOVA, *How Did Life Begin?*, PBS (July 1, 2004), <http://www.pbs.org/wgbh/nova/orgins/knoll.html> ("[W]e don't really know how life originated on this planet. There have been a variety of experiments that tell us some possible roads, but we remain in substantial ignorance.").

114. *Prize Value*, THE ORIGIN-OF-LIFE PRIZE, <http://us.net/life> (last visited Mar 7, 2018). "The Origin-of-Life Prize" . . . (hereafter called "the Prize") will be awarded for proposing a highly plausible natural-process *mechanism* for the spontaneous rise of *genetic instructions* in nature sufficient to give rise to life. The explanation must be consistent with empirical biochemical, kinetic, and thermodynamic concepts as further delineated herein, and be published in a well-respected, peer-reviewed science journal(s).

Id. The Prize was suspended after thirteen years on October 26, 2013 due to the complete lack of any qualifying submission. *Late News*, THE ORIGIN-OF-LIFE PRIZE, http://us.net/life/rul_late.htm (last visited Apr. 7, 2018).

115. Suzan Mazur, *Princeton Powwow: RNA World's Last Hurrah?*, SCOOP NEWS (Jan 16, 2013), <http://www.scoop.co.nz/stories/HL1301/S00026/princeton-powwow-rna-worlds-last-hurrah.htm>. (last visited 3-27-2018).

Leslie Orgil explained the difficulty of having a metabolic or energy producing system needed to power life without first having a life of its own that can produce the directed energy needed for life via the citric-acid or Krebs cycle:

There is no agreement on the extent to which metabolism could develop independently of a genetic material. In my opinion, there is no basis in known chemistry for the belief that long sequences of reactions can organize spontaneously—and every reason to believe that they cannot. The problem of achieving sufficient specificity, whether in aqueous solution or on the surface of a mineral, is so severe that the chance of closing a cycle of reactions as complex as the reverse citric acid cycle, for example, is negligible. The same, I believe, is true for simpler cycles involving small molecules that might be relevant to the origins of life and also for peptide-based cycles.¹¹⁶

Origin of life experts Sara Walker and Paul Davies get to the heart of the problem in a 2012 paper titled *The Algorithmic Origins of Life*.¹¹⁷ The heart of the problem lies in the difference between the “hardware of life”—its physical and chemical aspect—and its non-physical “programmed” “software” consisting of functional information that has a “semantic” quality, the same kind of information reflected in this Article that is the product of a mind. They explain:

Of the many open questions surrounding how life emerges from non-life, *perhaps the most challenging is the vast gulf between complex chemistry and the simplest biology*: even the smallest mycoplasma is immeasurably more complex than any chemical reaction network we might engineer in the laboratory with current technology. The chemist George Whitesides, for example, has stated, “How remarkable is life? The answer is: very. Those of us who deal in networks of chemical reactions know of nothing like it”. *The heart of the issue is that we do not know whether the living state is “just” very complex chemistry,*[which the Orthodoxy requires] *or if there is something fundamentally distinct about living matter*. Right at the outset we therefore face a deep conceptual problem, one asked long ago by the physicist Erwin

116. Leslie Orgel, *The Origin of Life—a Review of Facts and Speculations*, 23 TRENDS IN BIOCHEMICAL SCI. 491, 494-95 (1998).

117. Sara Walker & Paul Davies, *The Algorithmic Origins of Life*, 10 J. ROYAL SOC’Y INTERFACE 1 (2013).

Schrodinger, namely, *What is Life? Without a definition for life, the problem of how life began is not well posed.*¹¹⁸

In the above quote, notice how the ultimate question—what is the nature of life?—precedes the other. Where does life come from? The next paragraph indicates that the difference between life and non-life is life’s “*unique informational management properties*,” a concept entirely inconsistent with the Orthodoxy:

Although it is notoriously hard to identify precisely what makes life so distinctive and remarkable, there is general agreement that its informational aspect is one key property, and perhaps the key property. *The manner in which information flows through and between cells and sub-cellular structures is quite unlike anything else observed in nature. If life is more than just complex chemistry, its unique informational management properties may be the crucial indicator of this distinction, which raises the all-important question of how the informational properties characteristic of living systems arose in the first place.*¹¹⁹

The authors then explain that the answer to the question of how these *informational management* properties arose turns on the definition of “biological information.” In defining it, the authors show that the common materialistic description of biological information as “Shannon information,” is not appropriate as Shannon information only measures the “quantity” of information in a “message” in bits, not the quality, functionality or meaning of the message. Rejecting the materialistic definition, Walker and Davies recognize that the key aspect of biological information is its “functionality” that is meaningful and observable. In common parlance, this “functionality” or purpose of a message or digital application program is referred to as the semantic or meaningful aspect of “information.” This is the key problem for the Orthodoxy, as only a mind having forethought can produce meaning. Since mind is not allowed by the Orthodoxy, the authors use “functional” or “contextual” as more neutral modifiers and categorize the “semantic” modifier as “philosophy” rather than science.

This key question of origin may be satisfactorily answered only by first having a clear notion of what is meant by “biological information”. *Unfortunately, the way that information operates in biology is not easily characterized [perhaps because the obvious answer leads to a discussion of teleology which is forbidden by the*

118. *Id.* at 1 (emphasis and bracketed text added) (citations omitted).

119. *Id.* at 2 (emphasis added) (citations omitted).

Orthodoxy]. While standard information-theoretic measures, such as Shannon information, have proved useful, *biological information has an additional quality which may roughly be called “functionality”—or “contextuality”—that sets it apart from a collection of mere bits as characterized by Shannon Information content. Biological information shares some common ground with the philosophical notion of semantic information* (which is more commonly—and rigorously—applied in the arena of “high-level” phenomena such as language, perception and cognition).¹²⁰

In all of these cases where appeal is made to an informational narrative, we encounter context- (state-) dependent causation. In this respect, biological systems are quite unlike traditional mechanical systems evolving according to fixed laws of physics. . . . To be explicit, biological information is distinctive because it possesses a type of causal efficacy - it is the information that determines the current state and hence . . . the future state(s).¹²¹

The Authors then argue that traditional materialistic origin of life theories such as the RNA World hypothesis, fail as they do not recognize the functional, purposeful or teleological nature of biological information as autonomous or self-directing.

An implicit assumption of these traditional approaches [to origin of life] has been that, while information may be manifested in particular chemical structures (digital or analog), it has no autonomy. [Autonomy is “the quality or state of being independent, free, and self-directing.”] As such, information – though widely acknowledged as a key hallmark of life – thus far, has played only a passive role in studies of life’s emergence. Instead, hardware has dominated the discussion, *in accordance with the generally reductionist [materialistic] flavor of biology* in recent decades, with its associated assumption [the materialistic orthodoxy] *that, ultimately, all life is nothing but chemistry.*

...

Thus, the famed chicken-or-egg problem (a solely hardware issue) is not the true sticking point. Rather, the puzzle lies with something fundamentally different, a problem of causal organization having to do with the separation of informational and mechanical aspects into parallel causal narratives. *The real*

120. *Id.* (emphasis and bracketed text added) (citations omitted).

121. *Id.* at 3 (emphasis added) (citations omitted).

*challenge of life's origin is thus to explain how instructional information control systems emerge naturally and spontaneously from mere molecular dynamics.*¹²²

The authors then acknowledge that the recognition that life runs on instructional information control systems has a serious implication for the Orthodoxy as it may render it logically “undecidable.”

We point out a curious philosophical implication of the algorithmic perspective: if the origin of life is identified with the transition from trivial to non-trivial information processing . . . then a precise point of transition from non-life to life may actually be undecidable in the logical sense. This would likely have very important philosophical implications, particularly in our interpretation of life as a predictable outcome of physical law.¹²³

The authors argue that top-down thinking is necessary to develop a coherent origin of life hypothesis. This way of thinking starts with the recognition that all of life has a “Global organization,” as shown below in their “Table 1: The Hallmarks of life.” Global organization is evidenced by physics and chemistry “fine-tuned” for life in an instant during the big bang, and a common genetic code previously discussed. The list is obviously teleological, as it includes, among other things, the idea of a “universal constructor.”

<u>Hallmarks of Life</u>
Global organization
Information as a causal agency
Top-down causation
Analog and digital information processing
Laws and states co-evolve
Logical structure of a <i>universal constructor</i>
Dual hardware and software roles of genetic material
<i>Non-trivial replication</i>
Physical separation of instructions (algorithms) from the mechanism that implements them

Table 1: The hallmarks of life.¹²⁴

122. *Id.* at 5 (emphasis and bracketed text added).

123. Walker & Davies, *supra* note 117, at 8 (emphasis added).

124. *Id.* at 9 (emphasis added).

The paper concludes:

Characterizing the emergence of life as a shift in causal structure *due to information gaining causal efficacy over matter marks the origin of life as a unique transition in the physical realm*. It distinguishes nonliving dynamical systems, which display trivial information processing only, from living systems (and the complex systems derivative of biological systems, such as computers) which display nontrivial information processing as two logically and organizationally distinct kinds of dynamical systems.¹²⁵

In conclusion, the Orthodoxy's essential claim, that the apparent design of the universe and life is an illusion, is wholly unsupported. One may persuasively argue that the weight of the observable evidence clearly favors the teleological alternative.¹²⁶

- (4) Much of the evidence for materialistic increases in the diversity of life is also consistent or more consistent with the teleological alternative.

The fact that all the observable evidence favors an intelligent cause for the origin of the universe, its physics and chemistry and life raises a preliminary question regarding the cause of the diversity of life. If intelligence is necessary to get a universe fine-tuned for life and life started, is there any basis for excluding that alternative from consideration with respect to the origin of major increases in the diversity of life? Why exclude intelligence that is plausibly responsible for prokaryotes (single cell organisms without a nucleus and key organelles) as an alternative for the origin of eukaryotes (single celled organisms having highly organized DNA in a nucleus and membrane bound organelles)? If we include it for that sophisticated innovation, then why exclude it for the origin of all the major phyla during the Cambrian explosion 540 million years ago, orphan genes, human consciousness and other innovative increases in life's diversity? One would think that Occam's razor that selects the simpler of two competing explanations would not cut off the teleological alternative that best accounts for the available evidence for the origin of the universe and life.

However, that is not the case. Just as modern institutions of science assume a material cause for the universe and life, they also employ the

125. *Id.* at 10 (emphasis added).

126. See generally STEPHEN MEYER, SIGNATURE IN THE CELL: DNA AND THE EVIDENCE FOR INTELLIGENT DESIGN 37-38 (2009).

Orthodoxy to permit only materialistic/atheistic explanations for the origin of the diversity of life. One must assume that the same physical and chemical causes that cannot explain their origin or the origin of life do explain the evolution of the single cell prokaryote into a far more sophisticated single cell eukaryote using only random mutation and natural "selection" or sorting.

This historical account of the diversity of life, that uses the tunnel vision of the Orthodoxy rather than abductive reasoning, depends on at least four kinds of evidence to support its materialistic/atheistic narrative: (a) a fossil record and DNA sequences showing a progression of increasingly sophisticated organisms over time suggesting life arising from a common root or ancestor like that of a branching tree, (b) the idea that the process occurred gradually over seemingly limitless periods of time sufficient to explain random increases in complexity, (c) similarities of structure and function among organisms suggesting that all species are related to a common ancestor, and (d) examples of micro-evolution - mutation and selection acting within the populations of various species as is the case with the breeding of dogs and other animals and in cases of bacteria and viruses developing anti-bacterial resistance.

The problem is that nearly all of this evidence is also consistent with or more consistent with the banned teleological alternative. As a consequence, and as a minimum, it proves neither. As discussed in the following subsections, a weighing of all the relevant evidence arguably tips the scales in favor of the teleological alternative. However, the Orthodoxy effectively bans any consideration or weighing of *all* the relevant evidence. Only that which supports the Orthodoxy is considered and put in the scales. As a consequence, these untested explanations amount to nothing more than "dreaded just-so stories."¹²⁷

- (a) Statistical analyses suggest that the expected "waiting times" for increases in functional information increase exponentially and far exceed the available time, while no such analyses show that the apparent design of the complex programmed information in living organisms is an illusion.

The Neo-Darwinian Synthesis of evolution theory has depended primarily on the assumption that 3.5 billion years is sufficient time for random

127. Carol Cleland, *Historical Science, Experimental Science and the Scientific Method*, 29 GEOLOGY SOC'Y AM. 987, 990 (2001) (describing the difference between historical and experimental scientific methodology: "Failure to search for a smoking gun deprives a historical hypothesis of empirical grounding, turning it into a dreaded just-so story."). See *supra* Section V.B.2.

variation and natural sorting to explain all the diversity of life. However, recent experiments and simple math suggest that even trillions of years are not adequate to randomly achieve complex integrated function.

The basic problem with trying to explain innovation using only randomness and natural sorting is that it typically takes multiple coordinated steps to achieve a new function that is needed before positive sorting can occur to “fix” a new trait into a replicating population. For a duplicate gene to develop the recipe for a new binding site on a protein six or more integrated mutations are often required.¹²⁸ Natural sorting only arises when the new function is actually achieved and manifested in the organism. So, until all six steps are taken in an integrated manner nothing arises to be positively sorted.¹²⁹ In these cases natural sorting acts as a saboteur rather than as an innovator. It trashes random assaults on the software when they are not productive. Furthermore, as the new function requires more and more steps the likelihood of the function arising by chance decreases at an exponential rate.

One way to imagine this is to be locked in a barren room that has a combination lock on the door. To get out of the room to get food and water one must turn the knob on the lock to the correct combination. Suppose the lock on the door has only one dial with four positions (A, C, T and G). In the same manner one position or “switch” on a strand of DNA that codes for a particular gene can be occupied by any of the four ACTG nucleotide bases.

If the combination is a single letter A, C, T or G and there is only one dial on the door then the probability of opening the lock with one turn is 1/4. So, you need only turn the dial four times randomly to expect to open the door. P (probability) = $4/4 = 1$. However, suppose instead of one dial, there are three dials and the combination consists of three letters, such as ATG, the code that specifies the starting point for transcription. Then the possibilities are $1/4 \times 1/4 \times 1/4 = 1/64$ or $P = 1/64$. So to expect to get the door opened you now have to turn all three dials sixty-four times in succession $P=64$ (3 turn trials)/64 = 1. So, 3 turns x 64 = 192 discrete turns are necessary to expect to get the door open. This can probably be done in an hour, so you have no worry. You won't starve or die of thirst. But what if there are ten dials and the combination is ten characters long (like an alignment of ten bases on a

128. Michael J. Behe & David W. Snoke, *Simulating Evolution by Gene Duplication of Protein Features That Require Multiple Amino Acid Residues*, 13 PROTEIN SCI. 2651 (2004).

129. *Id.* See also ANN GAUGER, *Science and Human Origins*, in SCIENCE AND HUMAN ORIGINS, 20 (2012) (“The waiting time for seven coordinated neutral mutations to arise in a bacterial population is on the order of 1027 years. To put that in some sort of perspective, remember that the universe is only about ten¹⁰ years old.”); LEISOLA & WITT, *supra* note 74, at 179-193.

strand of DNA)? Now the possibilities are four multiplied by itself ten times or 1,048,576 possibilities. To get the door opened randomly will require 10 x 1,048,576 or 10,048,576 discrete turns which will take about three years of constant turning. You will dehydrate to death after a few days. Adding one more dial will increase the time to nine years, two more dials will take 36 years and thirteen dials will take about 144 years. What is happening is that as the complexity of the task increases only incrementally, the waiting times for function to arise from a random process increase exponentially. A few more dials and even four billion years is insufficient.

The length of an average sized gene in the oldest and simplest form of bacteria is about 900 bases or 900 dials long.¹³⁰ Thus, the gene has 4^{900} or 10^{540} possible combinations. Compare this to the ten-character length of a standard secure password for access to an internet web site. Given its length, random changes to the sequences that will produce new integrated function are exceedingly remote. Also, genomes are filled with “orphan genes,” which have no precursor or homologue in their most recent ancestor.¹³¹ As a consequence their rate of evolution must have been exceedingly fast rather than the gradual change the Darwinian mechanism depends upon. This significantly reduces the waiting times for complex functional information to arise by chance. Instead of billions of years, the evidence suggests changes have occurred in short periods of time, such as the appearance of humans 6 million years after their deemed closest prototype (chimps). Although the coordinated changes necessary to explain the differences likely exceed thousands, if not millions, the waiting time for just two coordinated random changes “would take 216 million years.”¹³² What are the expected waiting

130. The average length of a typical gene of a gram negative bacteria is 900 base pairs. Benjamin Lewin, *Bacterial gene numbers range over an order of magnitude*, CELLS, <http://bioscience.jpub.com/cells/MBIO137.aspx> (last visited Apr. 7, 2018).

131. Domazet-Lošo & Diethard Tautz, *An Evolutionary Analysis of Orphan Genes in Drosophila*, 13 GENOME RESEARCH 2213 (2003) (internal citations omitted). The article goes on to say:

“The evolutionary origin of orphan genes is still enigmatic. The first systematic discussions about the significance of orphan genes started with the completion of the yeast genome project. The term ‘orphan’ originally had a double meaning, namely coding regions without known function and coding regions without matches to other genes in the database. It is the latter definition that is now usually used. All genome projects to date have identified a substantial fraction of open reading frames (ORFs) that have no similarity to other genes in the database.”

Id. See also LEISOLA ET AL., *supra* note 74, at 118-119.

132. GAUGER, *supra* note 127, at 24-25.

times for an entirely new gene arising by chance that requires 900 integrated steps? More than a billion times 20 billion years.¹³³

A paper by biochemist Michael Behe and mathematician David Snoke illustrates the problem with the process even where new function is derived by randomly changing genetic letters in an existing duplicate gene rather than the de novo occurrence of an entirely new orphan gene. It is thought that much biological diversity arises from the accidental duplication of genes, where the duplicate serves no apparent function in the genome. The speculation is that as the duplicate gene is randomly mutated new positive functions may arise that will make the duplicate functional and the organism more fit. However, new function often requires multiple changes, not just one. It may take as many as thirteen changes to the duplicate to get the new function. The Behe - Snoke paper shows that to get new function requiring only six changes, in a replicating population of bacteria one would need to have a population the size of 10^{21} (one trillion, trillion, trillion, trillion) replicating over 100 million generations.¹³⁴

Work by biochemist Michael Behe, molecular biologist Douglas Axe and developmental biologist Ann Gauger show that the waiting times for a new function that requires seven mutations to be statistically implausible due to exponential decreases in probabilities and corresponding exponential increases in waiting times.¹³⁵

The problem is unimaginably compounded when one seeks to explain the origin of irreducibly complex systems. An irreducibly complex system is a single system which is necessarily “composed of several well-matched, interacting parts that contribute to the basic function, wherein the removal of any one of the parts causes the system to effectively cease functioning.”¹³⁶

133. WILLIAM A. DEMBSKI, *NO FREE LUNCH: WHY SPECIFIED COMPLEXITY CANNOT BE PURCHASED WITHOUT INTELLIGENCE* 21-22 (2007).

134. Michael J. Behe & David W. Snoke, *Simulating Evolution by Gene Duplication of Protein Features That Require Multiple Amino Acid Residues*, 13 *PROTEIN SCI.* 2651 (2004).

135. Ann K. Gauger & Douglas D. Axe, *The Evolutionary Accessibility of New Enzyme Functions: A Case Study from the Biotin Pathway*, 2011 *BIOCOMPLEXITY* 1, 2 (2011). See also MICHAEL BEHE, *THE EDGE OF EVOLUTION*, 44-63 (2007); Michael J. Behe & David W. Snoke, *Simulating Evolution by Gene Duplication of Protein Features That Require Multiple Amino Acid Residues*, 13 *PROTEIN SCI.* 2651 (2004). New discoveries show that genes may be expressed in many different ways so that one gene may function to produce many different gene products. Large parts of the genome appear to be ordered per codes yet to be discovered. Some of the depth of this fascinating mystery is found in a compilation of articles published in 2006. See David G. King et al., *Tuning Knobs in the Genome: Evolution of Simple Sequence Repeats by Indirect Selection*, in *THE IMPLICIT GENOME* 77 (Lynn Helena Caporale ed., 2006).

136. MICHAEL BEHE, *DARWIN'S BLACK BOX: THE BIOCHEMICAL CHALLENGE TO EVOLUTION* 39 (1996) [hereinafter *DARWIN'S BLACK BOX*]. Behe added the word “necessarily” in Michael

Certain biological systems, like mouse traps and other human-made machines, require many integrated components before they function as a whole. The flagellum of bacteria that date back to the earliest form of life is an example, as it consists of numerous interacting parts and loses function when one is missing. Until function arises naturally, selection acts as a saboteur rather than a helper during assembly of such systems when function is absent.¹³⁷ That leaves the generation of selectable basic function to random variation that is not statistically plausible where numerous integrated steps are required before selectable function arises.¹³⁸

Scientists whom have banned teleology with the Orthodoxy contend that the argument of irreducible complexity has been defeated.¹³⁹ However, the contention is not supported by detailed statistical analyses.¹⁴⁰ In a response to his critics, Professor Behe lists five highly regarded critics who acknowledge that they are unable to show any detailed Darwinian account for complex biochemical systems, including microbiologist James Shapiro of the University of Chicago, who explains: “There are no detailed Darwinian accounts for the evolution of any fundamental biochemical or cellular system, only a variety of wishful speculations.”¹⁴¹

New discoveries about DNA have caused scientists to question the adequacy of chance to explain biological function. A 2006 paper concludes that 80,000 “simple sequence repeats,” or “SSR’s” found in the human genome are not likely due to chance. SSR’s are segments of DNA not contained in genes that previously were thought to be non-functional “junk.” They are short sequences of bases that on average repeat more than fifty times in a series, such as “CTGCAG CTGCAG CTGCAG. . .” The author explains,

The probability that a particular sequence of n base pairs will appear at a specified site in a random DNA sequence is approximately $(1/4)^n$ [assuming equal proportions of each

Behe, *Reply to My Critics: A Response to Reviews of Darwin’s Black Box: The Biochemical Challenge to Evolution*, 16 *BIOLOGY & PHIL.* 691, 694 (2001) [hereinafter *Reply to My Critics*].

137. Robert Deyes & John Calvert, *We Have No Excuse: A Scientific Case for Relating Life to Mind*, *INTELLIGENT DESIGN NETWORK* 1, 12 (Nov. 28, 2009), www.intelligentdesignnetwork.org/We_have_no_excuse.pdf.

138. See MICHAEL J. BEHE, *THE EDGE OF EVOLUTION: THE SEARCH FOR THE LIMITS OF DARWINISM* 44-63 (2007); Michael J. Behe & David W. Snoke, *Simulating Evolution by Gene Duplication of Protein Features That Require Multiple Amino Acid Residues*, 13 *PROTEIN SCI.* 2651 (2004).

139. See *Reply to My Critics*, *supra* note 136.

140. See *Id.*; GAUGER ET AL., *supra* note 129, at 20.

141. *Reply to My Critics*, *supra* note 134, at 686 (quoting James A. Shapiro, *In the Details* . . . *What?*, *NAT’L REV.* at 62, 64 (Sept. 16, 1996)).

nucleotide]. Thus any repeated sequence longer than 20 or so base pairs is unlikely to appear solely by chance, even once, anywhere in the 3×10^9 base pairs of the human genome.)¹⁴²

If an SSR has an average length of six bases and each sequence has an average length of fifty repeats, then the average length of just one of the 80,000 SSR's is 300 bases. Thus, the probability of a chance formation of one 300 base pair sequence of SSRs is $1/4^{300}$ or roughly $1/10^{180}$ or essentially zero.

Due to recent discoveries, particularly relating to heritable epigenetic changes, a growing number of scientists are moving toward teleological mechanisms rather than only random mutation to explain increases in diversity. The sequencing of the entire genomes of a number of organisms have revealed that much of the human genome previously thought to be an accumulation of evolutionary “junk” is actually functional.¹⁴³ James A. Shapiro, a molecular biologist at the University of Chicago, writes of a revolution in thought that is occurring, one that will replace random mutation and natural selection as the core mechanisms of change.¹⁴⁴ He argues that science must replace orthodoxy with open-minded inquiry.¹⁴⁵ Health scientists find the reduction to natural cause orthodoxy holding back new ways of thinking necessary to achieve cures for disease and cancer.¹⁴⁶

142. David G. King et al., *Tuning Knobs in the Genome: Evolution of Simple Sequence Repeats by Indirect Selection*, in *THE IMPLICIT GENOME* 77, 77 (Lynn Helena Caporale ed., 2006).

143. John S. Matick, *The Hidden Genetic Program of Complex Organisms*, *SCI. AM.*, Oct. 2004, 61, 61-62.

Assumptions can be dangerous, especially in science. They usually start as the most plausible or comfortable interpretation of the available facts. But when their truth cannot be immediately tested and their flaws are not obvious, assumptions often graduate to articles of faith, and new observations are forced to fit them. Eventually, if the volume of troublesome information becomes unsustainable, the orthodoxy must collapse.

Id. at 61.

144. JAMES A. SHAPIRO, *EVOLUTION: A VIEW FROM THE 21ST CENTURY* 1-5 (2011) [hereinafter *VIEW FROM THE 21ST CENTURY*]; see also ALAN BENNETT, *EVOLUTION REVOLUTION: EVOLUTION IS TRUE, DARWIN IS WRONG, THIS CHANGES EVERYTHING* (2014); James A. Shapiro, *A Third Way*, *BOS. REV.* at 32 (Feb. 1997) [hereinafter *A Third Way*].

145. *A Third Way*, *supra* note 144, at 32-33.

146. Marc H.V. Van Regenmortel, *Reductionism and Complexity in Molecular Biology*, *European Molecular Biology Organization*, 5 *EMBO REP.* 1016, 1016 (2004) (“The reductionist method of dissecting biological systems into their constituent parts has been effective in explaining the chemical basis of numerous living processes. However, many biologists now realize that this approach has reached its limit. Biological systems are extremely complex and have emergent properties that cannot be explained, or even predicted, by studying their individual parts. The reductionist approach—although successful in the early days of

Nobel Laureate Robert Laughlin refers to evolution as an “antitheory” that is “not even wrong.”¹⁴⁷

The revolution and need for a new theory of evolution was evidenced by a conference held in Altenburg, Austria in July 2008 where sixteen “rock stars” of evolutionary biology met to develop a revised “evolutionary synthesis.”¹⁴⁸ More recently, Mazur described the state of evolutionary theory as being “mired in the bog.”¹⁴⁹

On January 17, 2018, Keven Laland, a professor of behavioral and evolutionary biology at University of St Andrews in Scotland, joined the cry for major revisions to evolutionary theory to account for inheritable changes that are not due to random mutations:

When researchers at Emory University in Atlanta trained mice to fear the smell of almonds (by pairing it with electric shocks), they found, to their consternation, that both the children and grandchildren of these mice were spontaneously afraid of the same smell. That is not supposed to happen. Generations of schoolchildren have been taught that the inheritance of acquired characteristics is impossible. A mouse should not be born with something its parents have learned during their lifetimes, any more than a mouse that loses its tail in an accident should give birth to tailless mice.

molecular biology—underestimates this complexity and therefore has an increasingly detrimental influence on many areas of biomedical research, including drug discovery and vaccine development As the value of methodological reductionism has been particularly evident in molecular biology, it might seem odd that, in recent years, biologists have become increasingly critical of the idea that biological systems can be fully explained using physics and chemistry.”).

147. ROBERT LAUGHLIN, *A DIFFERENT UNIVERSE: REINVENTING PHYSICS FROM THE BOTTOM DOWN* 168 (2006) (“Most important of all, however, the presence of such corollaries raises the concern that much of present-day biological knowledge is ideological. A key symptom of ideological thinking is the explanation that has no implications and cannot be tested. I call such logical dead ends antitheories because they have exactly the opposite effect of real theories: they stop thinking rather than stimulate it. Evolution by natural selection, for instance, which Charles Darwin originally conceived as a great theory, has lately come to function more as an antitheory, called upon to cover up embarrassing experimental shortcomings and legitimize findings that are at best questionable and at worst not even wrong.”).

148. SUZAN MAZUR, *THE ALTENBERG 16: AN EXPOSÉ OF THE EVOLUTION INDUSTRY* (2010); SUZAN MAZUR, *THE ALTENBERG 16: WILL THE REAL THEORY OF EVOLUTION PLEASE STAND UP?*, available at <http://www.suzanmazur.com/?p=20> (Apr. 12, 2018).

149. Suzan Mazur, *Saga of the Extended Evolutionary Synthesis*, *OSCILLATIONS* (Jan 30, 2018), <https://oscillations.net/2018/01/30/saga-of-the-extended-evolutionary-synthesis/> (the extended evolutionary synthesis “is clearly mired in the bog.”).

If you are not a biologist, you'd be forgiven for being confused about the state of evolutionary science. Modern evolutionary biology dates back to a synthesis that emerged around the 1940s-60s, which married Charles Darwin's mechanism of natural selection with Gregor Mendel's discoveries of how genes are inherited. The traditional, and still dominant, view is that adaptations—from the human brain to the peacock's tail—are fully and satisfactorily explained by natural selection (and subsequent inheritance) [of random mutations that by chance render the organism more fit]. *Yet as novel ideas flood in from genomics, epigenetics and developmental biology, most evolutionists agree that their field is in flux. Much of the data implies that evolution is more complex than we once assumed.*

Some evolutionary biologists, myself included, are calling for a broader characterization of evolutionary theory, known as the extended evolutionary synthesis (EES). A central issue is whether what happens to organisms during their lifetime—their development—can play important and previously unanticipated roles in evolution. *The orthodox view has been that developmental processes are largely irrelevant to evolution, but the EES views them as pivotal.*¹⁵⁰

Denis Nobel, a pioneer of systems biology, argues that the Neo Darwinian Synthesis should be replaced rather than extended. He finds that life is evidenced by teleology which he calls “natural purposiveness,” and that the Neo-Darwinian Synthesis needs to be replaced by a new theory which he calls Biological Relativity.¹⁵¹ He also challenges the use of a materialistic orthodoxy in science.¹⁵²

150. Kevin Laland, *Evolution Unleashed: Is Evolutionary Science Due for a Major Overhaul—or is Talk of ‘Revolution’ Misguided?*, AEON (Jan. 17, 2018); https://aeon.co/essays/science-in-flux-is-a-revolution-brewing-in-evolutionary-theory?utm_source=Aeon+Newsletter&utm_campaign=2f4c662fd1-EMAIL_CAMPAIGN_2018_01_15&utm_medium=email&utm_term=0_411a82e59d-2f4c662fd1-69916465 (emphasis and bracketed text added).

151. DENIS NOBLE, DANCE TO THE TUNE OF LIFE: BIOLOGICAL RELATIVITY 44-45, 112 (2017).

152. *Id.* at 73, 78.

[W]hat went wrong with Neo-Darwinism? In a single word: hubris. What went wrong was that the Modern Synthesis became hardened into dogmatism. Starting from the theory that this is the way in which evolution *could* have happened, it became transformed into the conviction that this was the only way in which evolution *must* have happened.

In summary, the argument that random mutations are adequate to show that the apparent design of living systems is an illusion, is not supported by statistical analysis or recent discoveries of increasingly sophisticated and complex information processing systems in living organisms.

- (b) Darwinian macro-evolution is based on an extrapolation supported by the orthodoxy rather than a weighing of the available evidence.

The weakness of the Orthodoxy to provide evidence to support a materialistic cause for the diversity of life is evidenced by the fact that the undisputed mechanisms which account for micro-evolutionary changes (such as antibiotic resistance and changes in the sizes of finch beaks) are used to explain far more complex macro-evolutionary innovations, such as the origin of orphan genes, eukaryotes and all of the new body plans and physical features that appeared suddenly in the Cambrian Explosion 540 million years ago. All very different kinds of exceedingly complex changes are lumped under the term *evolution*. No distinction is made between micro-evolutionary changes and macro-evolutionary changes. Molecular and Cell biologist Jonathan Wells, refers to it as “a verbal sleight of hand in place of evidence.”¹⁵³

The huge difference between evidence based microevolution and imagine based macroevolution is reflected in systems biologist Ronald Jenner’s summary of macroevolutionary explanations which “may end up being little more than untestable fiction”:

In their recent book on the Cambrian explosion, Erwin and Valentine (2013) *likened our attempts to infer the body plans of ancient animal ancestors to séances*. The older the nodes in question, the more apt this analogy is. *The divergences between most pairs of higher-level crown-group-sister taxa are so significant that the inferences of hypothetical ancestral body plans are generally accompanied by substantial error bars*. These become compounded as one integrates the inferences of increasing numbers of *hypothetical ancestors* to reach deeper and older nodes in the tree. *Add to this matrix of uncertainty the potentially limitless play of our imagination*, and our attempted explanatory

Id. at 137-38 (citations omitted).

153. JONATHAN WELLS, ZOMBIE SCIENCE, MORE ICONS OF EVOLUTION 21 (2017).

historical narratives *may end up being little more than untestable fiction.*¹⁵⁴

The sleight of hand that hides this reality behind the single *evolution* descriptor is called an “extrapolation.” Extrapolations base explanations on conjecture rather than evidence. Webster’s defines an extrapolation as “a projection into an area not known or experienced [i.e. how did an octopus get its eyes?] to arrive at a usually *conjectural knowledge* of the unknown area by inferences based on an assumed continuity, correspondence, or parallelism between it and what is known.”¹⁵⁵

The extrapolation used by modern science is reflected in a word search of the *Framework for K-12 Science Education*¹⁵⁶ and related *Next Generation Science Standards*¹⁵⁷ published in 2012 and 2013, respectively, and embraced by a majority of U.S. states by the end of 2017. The words *micro-evolution*, *macro-evolution*, *microevolution*, and *macroevolution*, do not appear on any of the 950 pages, while the word *evolution* or *evolutionary* appear 120 times.¹⁵⁸ One may search the pages for a glossary of key assumptions and terms such as *science*, *evolution*, *mechanism*, *teleology*, *abduction*, *historical science*, and come up empty handed. The lumping of both micro and macro evolution under *evolution* permits the evidence-based narratives for random micro-evolutionary changes within species to conceal the use of Orthodox driven imagination, to explain the origin of innovative macroevolutionary changes, such as the origin of all the major animal body plans during the Cambrian Explosion.¹⁵⁹ Thus, rather than provide statistical evidence and evidence

154. Ronald A. Jenner, *Macroevolution of Animal Body Plans: Is there Science after the Tree?*, 64 *BIO SCI.* 653, 653, 662 (2014) (emphasis added) (“We have, therefore, little choice but to resort to our more-or-less informed imagination to produce the historical narratives that are the ultimate goal of our studies of animal evolution.”).

155. MERRIAM-WEBSTER’S UNABRIDGED DICTIONARY (2018): “extrapolate: 2. a. (1) : to project, extend, or expand (known data or experience) into an area not known or experienced so as to arrive at a usually conjectural knowledge of the unknown area by inferences based on an assumed continuity, correspondence, or other parallelism between it and what is known ...<extrapolating the present geological state of the earth to its state billions of years ago>”

156. NAT’L RESEARCH COUNCIL OF THE ACADS., *A FRAMEWORK FOR K-12 SCIENCE EDUCATION: PRACTICES, CROSSCUTTING CONCEPTS, AND CORE IDEAS* (2012), <https://www.nap.edu/catalog/13165/a-framework-for-k-12-science-education-practices-crosscutting-concepts> [hereinafter *FRAMEWORK*].

157. *NGSS LEAD STATES, NEXT GENERATION SCI. STANDARDS: FOR STATES, BY STATES* (2013), <https://www.nextgenscience.org/> [hereinafter *STANDARDS*].

158. *Id.*

159. The problems that plague macro-evolution and the Cambrian Explosion are detailed by Stephen Meyer in *DARWIN’S DOUBT: THE EXPLOSIVE ORIGIN OF ANIMAL LIFE AND THE CASE FOR INTELLIGENT DESIGN* (2013).

based analysis to support the claim of illusion for the apparently designed major innovations of life, the modern paradigm depends on an extrapolation that conceals the imagination that supports the required materialistic claim of chance.¹⁶⁰

Empirical research also shows that the misleading nature of the extrapolation is material, not insignificant. Biochemist Michael Behe followed up his International Best Seller, *Darwin's Black Box*, with the *Edge of Evolution: The Search for the Limits of Darwinism*.¹⁶¹ Behe's analyses show that most examples of mutations that have produced recognized adaptations at the micro-evolutionary level amount to loss of function mutations.¹⁶² An example of a beneficial loss of function would be a mutation that provides resistance to malaria through the development of a change in the shape of a blood cell to a sickle cell shape that is resistant to malaria but also harmful to the over-all health of the individual. The frequency of adaptations due to loss of function changes suggests that most mutations actually involve a loss of information rather than a gain of information. For example, one might send a message "Help Jan now." A mutation may cause the letter "a" in "Jan" to become an "o" so the false message is to help Jon instead of Jan. Although, Jon may not need any help, the message would still have a positive effect, as Jon might actually like the help provided. However, in the process Jan might wind up drowning due to the error. Another example of this effect is in research on the Aids virus which mutates rapidly to defy implementing vaccines. The new varieties of virus are resistant to new regimens but actually less robust than the original wild type form because they represent loss of function mutations.¹⁶³

Most studies also show that mutations are very rarely adaptive or beneficial. The far largest proportion are either harmful, fatal or near neutral.

160. James A. Shapiro, *Genome System Architecture and Natural Genetic Engineering in Evolution*, 870 ANNALS N.Y. ACAD. SCI. 23, 31 (1999) ("One of the most important questions in evolution is: How can new adaptations originate? This is a difficult question, because most evolutionary novelties, such as the eye or the wing, involve the orchestrated expression of many different loci, a number of which act in the expression of multiple phenotypes. Conventional explanations that randomly generated advantageous changes in the complex characters accumulate one locus at a time are unconvincing on both functional and probabilistic grounds, because there is too much interconnectivity and too many degrees of mutational freedom."); see also LEISOLA ET AL., *supra* note 76, at 82-85.

161. DARWIN'S BLACK BOX, *supra* note 136; see also MICHAEL J. BEHE, THE EDGE OF EVOLUTION: THE SEARCH FOR THE LIMITS OF DARWINISM 1-7 (2007); *Reply to My Critics*, *supra* note 134.

162. Michael J. Behe, *Experimental Evolution, Loss-of-Function Mutations, and "The First Rule of Adaptive Evolution,"* 85 Q. REV. BIOLOGY 419 (2010).

163. BEHE, *supra* note 161, at 157-58.

Geneticist John Sanford argues that the near neutral ones tend to accumulate within the genome like rust on a car. Eventually the accumulation of near neutral mutations will cause the organism to die.¹⁶⁴

Accordingly, if most mutations that actually improve fitness are of the loss of function type that produce adaptation due to a loss of information rather than a gain of information, then the already too long waiting times for innovative mutations should be off the charts.¹⁶⁵

Behe's overall conclusion in the *Edge of Evolution* is that random mutation and natural selection can operate effectively within species and families of organism, but there appears to be a limit to the kinds of innovations or macro-evolutionary changes we can expect them to produce, certainly not new systems like an eye.¹⁶⁶ Similarly, Matti Leisola, a biomedical engineer who seeks to develop more effective enzymes in the lab using both random and designed techniques, concludes:

It is increasingly clear to me that random mutations cannot produce novel functional information – even one new gene – with or without help from natural selection and with or without help from any of the other ancillary mechanisms proposed to rescue neo-Darwinian theory from the swelling onslaught of contrary evidence.¹⁶⁷

Although Behe's work and that of others may be questioned, it's clear that the extrapolation used by the standard model is subject to substantial evidential questions as well as the logical one of banning the evidence-based teleological alternative. "If you are only prepared [or permitted] to consider one possibility, then there is only one possibility."¹⁶⁸ In such case the evidence really doesn't matter, but really, is that science?

- (c) The orthodox materialistic biological origins narrative depends on the metaphor of a branching tree of life, a pattern that is more consistent with the teleological alternative.

Darwin developed the idea of life emerging gradually like a tree growing seamlessly from a small seed. His idea was that the tree would grow from a

164. JOHN SANFORD, *GENETIC ENTROPY & THE MYSTERY OF THE GENOME* (2005).

165. GAUGER ET AL., *supra* note 129, at 15-43.

166. BEHE, *supra* note 161, at 64-102.

167. LEISOLA ET AL., *supra* note 76, at 171-95.

168. MOSHE AVERICK, *NONSENSE OF A HIGH ORDER: THE CONFUSED WORLD OF MODERN ATHEISM* 99-102 (2016).

common ancestor at the root via the gradual successive natural “selection” or sorting of a series of beneficial random mutations. Just as we can observe trees grow over time one can then imagine life arising in the same gradual way with all limbs and branches of the tree sharing some common traits such as a genetic code, common information and energy processing systems and the like.

The metaphor is powerful if the only causal possibility is chance and necessity. However, when the evidence-based teleological alternative is considered the idea fails to plausibly tip the scales.

First, the observed pattern is not gradual, continuous or seamless. New animal body plans appear abruptly in the fossil record and then persist largely unchanged until they then disappear. Molecular phylogenies show a tangled thicket having different roots rather than the pattern of a tree.¹⁶⁹ According to paleontologist Conway Morris the record shows the origin of similar organs like eyes to have occurred separately on many occasions not via a branching tree pattern from common ancestors, but independently. He suggests that this mystery may be explained by the idea that evolution itself is an overall design, perhaps even with a purpose.¹⁷⁰ Due to the Orthodoxy, but not mentioning it, biologist Ronald Jenner believes the gaps in the pattern can only be filled with “informed *imagination* to produce the [materialistic/atheistic] historical narratives that are the ultimate goal of our studies of animal evolution.”¹⁷¹

The only thing tree-like in the pattern is that life does become more sophisticated over time and does share a common genetic code not explained materialistically. However, this actual pattern observed is even more consistent with a pattern that emerges from a system of common design using a common language. One might draw a tree depicting the evolution of four wheel vehicles beginning with a simple cart or wagon and ending with a sophisticated Lamborghini. The problem for the materialist is that patterns evolving from intelligence typically are interspersed with significant gaps, rather than a continuous flow of change as the Darwinian process dictates but does not show. The evolution of the horse drawn carriage into the

169. JONATHAN WELLS, *ICONS OF EVOLUTION: SCIENCE OR MYTH?* 29-58 (2000); STEPHEN JAY GOULD, *WONDERFUL LIFE: THE BURGESS SHALE AND THE NATURE OF HISTORY* (1989).

170. See MORRIS, *supra* note 112, at 13.

171. Jenner, *supra* 154, at 653 (emphasis and bracketed text added); see also *id.* (“We have, therefore, little choice but to resort to our more-or-less informed *imagination* to produce the historical narratives that are the ultimate goal of our studies of animal evolution. Only by fully engaging with the challenges of devising testable scenarios will we be able to tell where along the spectrum of science and fiction our understanding of animal body plan evolution will finally come to rest.”) (emphasis added).

automobile was not seamless. The internal combustion engine that drives the auto did not arise from the horse, rather it was invented by the minds of men. Since the historical record actually reflects significant discontinuities as in the case of the Cambrian explosion,¹⁷² the evidence of the branching tree arguably supports the banned teleological hypothesis rather than the materialistic one.

Thus, objectivity requires that one be aware that life's branching pattern of increasing sophistication supports both ideas and but is actually more consistent with the teleological hypothesis.¹⁷³

- (d) Similar features among organisms do not prove the materialistic narrative, as they are consistent with the banned alternative.

The materialistic biological origins narrative is based primarily on evidence of similarity of structures and systems among different species. The argument is made that if all life uses the same genetic code then all organisms have adapted by random mutation and natural selection from a common ancestor. The problem with the inference is that the evidence of a common "eerily perfect" genetic code that cannot be explained by chance or physics and chemistry also provides a persuasive case for the disallowed and not mentioned teleological hypothesis. This follows, because there is no materialistic explanation for the origin of the code itself.¹⁷⁴ In human experience "codes" are only produced by minds having the capacity for forethought. Thus, the evidence of a common code is actually more consistent with the teleological hypothesis than the materialistic cause that lacks forethought.

The materialistic argument is based on an extrapolation that fails when both alternatives are considered. The materialist argues that because the limbs of bats, dolphins, horses and humans are similar in structure, they must have arisen via random mutation and natural selection from a common ancestor. Because the developmental stages of embryos, fishes, salamanders, tortoises, chicks, hogs, calves, rabbits and humans appear to be similar they must have the same evolutionary history and share the same common ancestry. Ernst Haeckel expressed the idea as "ontogeny recapitulates

172. STEPHEN MEYER, *DARWIN'S DOUBT: THE EXPLOSIVE ORIGIN OF ANIMAL LIFE AND THE CASE FOR INTELLIGENT DESIGN* 357-58 (2013).

173. See generally WELLS, *supra* note 153, at 25-48.

174. MORRIS, *supra* note 112, at 13; see also Stephen J. Freeland & Laurence D. Hurst, *The Genetic Code Is One in a Million*, 47 J. MOLECULAR EVOLUTION 238 (1998).

phylogeny” through the use of misleading drawings of the embryos purporting to show similar morphologies.¹⁷⁵

However, the larger problem is that similarity in the development can also be explained by significant observed evidence and statistical analysis that implies design and purpose, not random occurrences. Even Richard Dawkins acknowledges that life appears to “have been brilliantly designed for a purpose.”¹⁷⁶ The teleological inference is not drawn from the Bible. Rather, it is inferred from the direct observation and statistical analysis of the information processing systems of life that have been compared to the human designed Linux operating system, which is far less robust.¹⁷⁷ The evidence that different species use the same code and have similar body plans is also consistent with a system that uses common design strategies. Similar cellular systems are analogous to commonly designed Windows-based laptop computers which exhibit a common operating code and keyboards. In fact, if living systems are the product of design then one would expect common design features to be ubiquitous in the natural world as is actually the case.

The teleological alternative is also supported by the fact that many biological systems like eyes have arisen in a number of different animals that do not share the same common ancestry. The phenomena is called convergent evolution. Arguably, ubiquitous convergence suggests common design rather than common ancestry, which convergence lacks.¹⁷⁸

However, the Orthodoxy bans any mention of the competing design hypothesis. The elimination of the competing hypothesis by the Orthodoxy rather than evidence is not explained to students and patrons of science. With the elimination of the competitor by doctrine, then the similarities among all living things makes a very misleading but persuasive case for the materialistic/atheistic claim.

One can imagine a prosecutor telling a grand jury in secret that defendant must be guilty because his fingerprints were on the murder weapon. If he

175. WELLS, *supra* note 169, at 81–109.

176. MAZUR, *supra* note 148, at 99. In an interview of the atheist Richard Dawkins: Where do animals and plants get this powerful impression that they have been brilliantly designed for a purpose? Where does that come from? That does not come from the laws of physics on their own. That cannot come from anything that has so far been suggested by anybody other than [random mutations and] natural [sorting] selection.

Id. (emphasis added.) Of course, “natural” sorting did not operate until after the origin of apparently designed physics and chemistry and replicating life.

177. Carl Zimmer, *Linux Versus E. Coli*, DISCOVER (May 3, 2010), <http://blogs.discovermagazine.com/loom/2010/05/03/linux-versus-e-coli/#.UOxfRXexXQg>.

178. See MORRIS, *supra* note 112, at 13.

omits to also tell the jury that the prints of an alleged burglar who was present at the time of death were also on the gun, the jury may likely indict the wrong person.

- (e) The tunnel vision of the Orthodoxy permits evidence-based arguments against the teleological alternative but not evidence-based arguments for it.

The use of the materialistic Orthodoxy in an investigation about the cause of life is akin to a criminal investigation that uses “tunnel vision” to produce a wrongful conviction:

Tunnel vision . . . results from a narrow focus on a limited range of possibilities. Consequently, alternative theories to the crime are not considered and potential suspects are eliminated from the investigation. This heuristic is particularly ill-suited to solving complex, dynamic investigations. Focusing on the first likely suspect, then closing the investigation off to alternative theories is a recipe for disaster.¹⁷⁹

Tunnel vision infects all the claims typically made by materialists. One example is that of dysteleology. Dysteleology is the argument that because many living systems are poorly designed they are the product of random mutation rather than an intelligence. The dysteleological argument is typically advanced by showing that some organs in humans that previously had function in ancestral systems now lack function. The idea is that if the present system had been designed by an intelligent designer, the designer would have removed these obsolete parts. Therefore, the system is not designed. The evidence advanced to support the poor design argument includes examples of “vestigial organs,” such as so-called junk DNA, the appendix, wisdom teeth and the coccyx or tailbone. Other examples are the supposed suboptimal design of the eye and the existence of human evil, pain, suffering, and disease.

In a sense dysteleology is ubiquitous to the entire case for materialistic evolution. The reason is that, as previously explained by Richard Dawkins, all biological systems look as if they were “brilliantly designed for a purpose.”¹⁸⁰ Thus the entire function of the materialistic argument is to show

179. D. Kim Rossmo, *Failures in Criminal Investigation*, POLICE CHIEF, Oct. 2009, at 54 (emphasis added).

180. MAZUR, *supra* note 148, at 99.

that the appearance of brilliant design is an illusion.¹⁸¹ Dysteleology aids the claim of illusion, but only when the tunnel vision of the Orthodoxy suppresses the counter arguments.

Judge Jones in the *Kitzmiller* case proscribed the discussion of intelligent design in K-12 science classes by classifying the inference to intelligence as religious while classifying the materialistic and atheistic Orthodoxy that bans the inference as science.¹⁸² Effectively, he mandated that students only be taught dysteleology in a robust manner.¹⁸³ This allows students to be systematically taught that living systems are not designed even though they look designed. He effectively outlawed the positive case for teleology as well as legitimate “gaps” or criticisms of the dysteleological argument that supports materialistic evolution.¹⁸⁴

There are three fundamental problems with explicit dysteleology based on suboptimality. First, a poor design does not prove no design. This Article may be viewed by some as poorly designed. However, it is still designed—the product of a teleological process. Thus, an alleged poor design of the eye does not prove it to be not designed. Also, the argument of poor design is a theological argument that assumes the intelligence is an omniscient, ever present all powerful God, which an inference to design does not entail.¹⁸⁵

The argument of “poor design,” also assumes that we know what is “poor.” In many cases, systems that look poorly designed were intentionally designed to achieve other benefits. For example, a car may be designed to use heavy materials to achieve a high safety rating at the expense of lower fuel economy.

Furthermore, many of the systems claimed to be poorly designed have actually been found to have functions beneficial to humans. Junk DNA,¹⁸⁶ the

181. See generally RICHARD DAWKINS, *THE BLIND WATCHMAKER: WHY THE EVIDENCE OF EVOLUTION REVEALS A UNIVERSE WITHOUT DESIGN* 6, 21 (1986) (includes discussions between evolutionary biologists).

182. See Calvert, *supra* note 45, at 313-19 (discussing *Kitzmiller v. Dover Area Sch. Dist.*, 400 F. Supp. 2d 707 (M.D. Pa. 2005)).

183. *Id.* at 326-27.

184. *Id.* at 313-27.

185. *Reply to My Critics, supra* note 136.

186. WELLS, *supra* note 153, at 125-30.

appendix,¹⁸⁷ coccyx¹⁸⁸ and wisdom teeth¹⁸⁹ have all been discovered to be beneficial to humans.

Arguments that the eye is poorly designed have been met by other arguments showing the design to be optimal rather than suboptimal.¹⁹⁰ Much of the evidence for dysteleology evaporates as new discoveries and greater understanding of systems is achieved. For thirty years, a major argument for dysteleology was the contention that 98% of the human genome consisted of non-coding junk. Not only was the junk thought to be evidence of discards from random mutations over eons of time, but the existence of the junk made clear the system could not have been designed. No designer would clutter his invention with 98% junk. Since the completion of the human ENCODE project in 2012, a consortium of scientists discovered that at least 80% of the junk is actually functional.¹⁹¹ Furthermore, the project has revealed a breathtaking unimagined level of information processing sophistication. Thus, as our knowledge of the functional information that runs life increases the dysteleological arguments become embarrassments.¹⁹²

A third problem with explicit dysteleology is that it omits to explain that it is an idea driven by the Orthodoxy, which is itself explicitly dysteleological. Thus, if the Orthodoxy was not imposed, both the teleological and

187. “New research suggests that the seemingly useless organ [the appendix] provides a safe haven for good bacteria to hang out in the gut.” Jennifer Warner, *Appendix May Actually Have a Purpose: Researchers Say the Appendix May Be a Place Where Good Bacteria Can Live Safely*, WEB MD (Oct 12, 2007), <https://www.webmd.com/digestive-disorders/news/20071012/appendix-may-have-purpose#1>.

188. “The coccyx serves as an attachment site for tendons, ligaments, and muscles. It also functions as an insertion point of some of the muscles of the pelvic floor. The coccyx also functions to support and stabilize a person while he or she is in a sitting position.” *Coccyx*, HEALTHLINE (Feb. 26, 2015), <https://www.healthline.com/health/human-body-maps/coccyx/male#1>.

189. Shawn Watson writes:

Our earliest ancestors survived on a diet of raw meat, nuts, roots, berries, and leaves. Cro-Magnon man didn't have the luxury of using knives to cut and prepare his food and cooking his meat wasn't even thought of then. Chewing these tough, coarse, and rugged foods required a broader jaw and strong molars—including the wisdom teeth.

Shawn Watson, *Why Do We Have Wisdom Teeth? Blame Our Ancestors for Those Painful Teeth*, VERYWELLHEALTH (March 25, 2018), <https://www.verywell.com/why-do-we-have-wisdom-teeth-1059377>.

190. Pablo Artal, Antonio Benito, & Juan Tabernero, *The Human Eye is an Example of Robust Optical Design*, 6 J. VISION 1, 4-6 (2006); WELLS, *supra* note 153, at 131-48.

191. The ENCODE Project Consortium, *An Integrated Encyclopedia of DNA Elements in the Human Genome*, NATURE, Sept. 6, 2012, at 57.

192. JONATHAN WELLS, THE MYTH OF JUNK DNA 97-104 (2011).

materialistic ideas would be viewed as legitimate competitors. In that case, the spectators in the audience would then have to ask, does the evidence as a whole show the appearance of “brilliant” design to be an illusion.

- (f) The statement that all “real” scientists agree that life is due to random mutation and natural selection is both false and misleading.

The often heard statement is clearly false as natural selection only operates with replication. Replication does not occur until after the origin of life. As explained above in Section V.B.1.b.(2), the weight of the relevant evidence favors a teleological explanation for the origin of life, not a materialistic one.

The statement is also false in that many recognized scientists actually have publicly registered dissent from the idea. The Discovery Institute maintains a website of scientists holding doctoral degrees that have publicly stated their skepticism of the ability of random mutation and natural selection to account for the complexity of life. The statement reads, “A SCIENTIFIC DISSENT FROM DARWINISM. ‘We are skeptical of claims for the ability of random mutation and natural selection to account for the complexity of life. Careful examination of the evidence for Darwinian theory should be encouraged.’”¹⁹³ As of 2016, the list had grown to over 1,000, “a disproportionate number [of which] are tenured faculty members, nearing retirement, and/or emeritus faculty [which one] would expect in an academic culture where voicing skepticism of Darwinian dogma can be dangerous to one’s career.”¹⁹⁴

In addition, as previously discussed, due to increases in our scientific knowledge of the genome and epigenome, numerous reputable scientists are seeking a replacement of the Neo-Darwinian Synthesis as they do not believe random mutation and natural selection are adequate to explain all the diversity of life.¹⁹⁵ The books listed document a recent revolution in evolutionary theory. As new evidence is discovered through the Human

193. *A Scientific Dissent from Darwinism*, DISSENTFROMDARWIN.ORG 1 (Nov. 2016), <http://www.discovery.org/scripts/viewDB/filesDB-download.php?command=download&id=660>.

194. LEISOLA ET AL., *supra* note 76, at 113 (emphasis and bracketed text added).

195. MAZUR, *supra* note 148; SUZAN MAZUR, *THE PARADIGM SHIFTERS: OVERTHROWING ‘THE HEGEMONY OF THE CULTURE OF DARWIN’* (2015) [hereinafter *THE PARADIGM SHIFTERS*]; SUZAN MAZUR, *ROYAL SOCIETY: THE PUBLIC EVOLUTION SUMMIT* (2016) [hereinafter *ROYAL SOCIETY*]; NOBLE, *supra* note 151, at 44–45, 73 (2017); *VIEW FROM THE 21ST CENTURY*, *supra* note 144; J. SCOTT TURNER, *PURPOSE & DESIRE: WHAT MAKES SOMETHING “ALIVE” AND WHY MODERN DARWINISM HAS FAILED TO EXPLAIN IT* (2017); BENNETT, *supra* note 144; ANDREAS WAGNER, *ARRIVAL OF THE FITTEST: SOLVING EVOLUTION’S GREATEST PUZZLE* (2014); DR. LEE SPETNER, *THE EVOLUTION REVOLUTION: WHY THINKING PEOPLE ARE RETHINKING THE THEORY OF EVOLUTION* (2014).

Genome and ENCODE projects, scientists are becoming increasingly skeptical that innovations may be explained with only the stochastic processes of random mutation and natural selection. Geneticist James Shapiro, a leader in this movement, concludes that changes in the genome are being engineered by the cell itself through “natural genetic engineering.”¹⁹⁶ Adding the “natural” modifier facially conforms the idea to the Orthodoxy. More recently, Denis Noble, a pioneer of systems biology, argues that life is evidenced by teleology which he calls “natural purposiveness,” and that the Neo-Darwinian Synthesis needs to be replaced by a new theory which he calls Biological Relativity.¹⁹⁷

Suzan Mazur, a science journalist, has been reporting on the activities of the “Paradigm Shifters” at a number of closed door meetings.¹⁹⁸

Of course, the more serious problem with the frequently heard statement of consensus is that it fails to explain that institutions of science demand compliance with the Orthodoxy to be a “real scientist.” Thus, the consensus is essentially mandated rather than the result of an objective consideration of all the available evidence. The Orthodoxy permits only materialistic explanations of complex semantic information found in the origin of the universe and in all living systems. Since Neo-Darwinism (random mutation and natural sorting) is the only permitted cause for the origin of all biodiversity, a modern scientist who depends on institutions of science for tenure, employment or publication simply cannot register any dissent without significant cost to both the person and the family of the scientist.

A 2008 film that documents the strategy employed by the authority to enforce the Orthodoxy is *Expelled: No Intelligence Allowed*,¹⁹⁹ starring Ben Stein, while books by the persecuted chronicle the cases of many other dissidents.²⁰⁰

Kitzmiller’s Error explains how the Orthodoxy has actually become a religious orthodoxy that is promoted with religious zeal.²⁰¹

196. VIEW FROM THE 21ST CENTURY, *supra* note 144, at 2.

197. NOBLE, *supra* note 151, at 44-45, 112.

198. MAZUR, *supra* note 148; THE PARADIGM SHIFTERS, *supra* note 195; ROYAL SOCIETY, *supra* note 195.

199. EXPELLED: NO INTELLIGENCE ALLOWED (Premise Media Corporation Apr. 18, 2008).

200. See *supra* Section V.B.1.a; see also JERRY BERGMAN, SLAUGHTER OF THE DISSIDENTS 1-7 (2008); LEISOLA ET AL., *supra* note 76, at 113.

201. See Calvert, *supra* note 45, at 297-306.

2. Modern Origins Science, a Historical Science, is Not Objective
Because the Orthodoxy Violates the Logic Necessary for the Testing
of its Historical Hypotheses.

The second reason modern origins science is not objective is that it is a historical science that uses the Orthodoxy and its command rather than the logic of abductive reasoning that is necessary to make its case. Abductive reasoning seeks an inference to the best of the possible explanations for an unobserved past event based on the available evidence. It is the tool used for testing historical hypotheses.²⁰² However, due to the Orthodoxy's ban of the competing teleological hypothesis the test is not permitted. As a consequence, modern origins science explanations lack "empirical grounding, turning [them] into . . . dreaded just-so stor[ies]."²⁰³

Historical science is different from empirical science that relies on experiment and observation to test hypotheses using deductive and inductive reasoning. The hypothesis that the apple is pulled to the ground by the force of gravity when its stem breaks can be tested repeatedly under the same observed conditions. However, when one asks, "where does the apple tree, its seeds, and other plants come from in general," one may not presently observe the series of integrated events that caused the first seed. The pathway of events and the initial conditions of each have occurred millions of years ago under circumstances that cannot be presently observed or replicated.

Instead one must look for evidence or clues that do presently exist about the past, develop possible hypotheses as to the initial cause or causes, and then weigh the available evidence to permit an inference to the best of the competing explanations. Any conclusion will be necessarily probabilistic and based in part on imagination, speculation, opinion, the validity of assumptions used by the investigator and also the bias of the investigator.²⁰⁴

202. See generally Carol Cleland, *Historical Science, Experimental Science, and the Scientific Method*, GEOLOGY, Nov. 2000, 987, 987-990 (describing the difference between historical and experimental scientific methodology). For a good description of the difference between deductive, inductive, and abductive reasoning see *Tip Sheet: Deductive, Inductive and Abductive Reasoning*, BUTTE COLLEGE, <http://www.butte.edu/departments/cas/tipsheets/thinking/reasoning.html>.

203. Carol Cleland, *Historical Science, Experimental Science, and the Scientific Method*, GEOLOGY, Nov. 2000, at 987, 990. "Failure to search for a smoking gun deprives a historical hypothesis of empirical grounding, turning it into a dreaded just-so story." *Id.*

204. The following reflects an evolutionary explanation for the origin of the eye that is based on imagination, rather than evidence: "It's easy to *imagine* how a random mutation *might have* produced a patch of light-sensitive cells that helped a primitive creature tell day from night. You can also *imagine* how another mutation *might have* bent this patch of cells into a concave shape that could detect the direction a light or shadow was coming from—

An objective approach requires a disclosure and justification of the assumptions and speculations used and the bias of the investigator.²⁰⁵ Often the evidence is insufficient to permit an inference to the best explanation, in which case one must acknowledge that the case is not closed. Newly discovered evidence, such as the discovery that most of the “junk” in the human genome is functional, may necessitate a reweighing of the evidence.²⁰⁶

The fact that origins science is a historical rather than an experimental science was explained in 2000 by the renowned evolutionary biologist Ernst Mayr:

Darwin introduced historicity into science. Evolutionary biology, in contrast with physics and chemistry, is a historical science—the evolutionist attempts to explain events and processes that have already taken place. *Laws and experiments are inappropriate techniques for the explication of such events and processes. Instead one constructs a historical narrative, consisting of a tentative reconstruction of the particular scenario that led to the events one is trying to explain.*²⁰⁷

Carol Cleland, a philosopher of science, agrees. “Although fields such as paleontology and archaeology provide the familiar examples, historical hypotheses are also common in geology, biology, planetary science, astronomy, and astrophysics. The focus of historical research is on explaining existing natural phenomena in terms of long past causes.”²⁰⁸

Cleland explains that “scientists engage in two very different patterns of evidential reasoning, and one of these patterns predominates in historical research and the other in classical experimental research.”²⁰⁹ Experimental research uses primarily deductive and inductive reasoning while historical science relies primarily on abductive reasoning.

Because historical sciences depend on abductive reasoning to determine the best of competing explanations for the cause of unobserved and unobservable past events, historical narratives reduce to opinions not facts.

helping creatures with the mutation stay clear of predators.” Claudia Wallis, *The Evolution Wars*, TIME 27, 30 (Aug. 15, 2005) (emphasis added).

205. ROB STADLER, THE SCIENTIFIC APPROACH TO EVOLUTION; WHAT THEY DIDN'T TEACH YOU IN BIOLOGY 7-24 (2016).

206. WELLS, *supra* note 153, at 125-30 (2017).

207. Ernst Mayr, *Darwin's Influence on Modern Thought*, 283 SCI. AM. 79, 80 (2000) (emphasis added).

208. Carol E. Cleland, *Methodological and Epistemic Differences Between Historical Science and Experimental Science*, 69 PHIL. SCI. 474, 474-75 (2002).

209. *Id.* at 476.

The opinions are expressed in probabilistic terms—event *A* was "most likely" or "beyond a reasonable doubt" caused by *X*. A third possibility is "we don't know"—we lack the evidence necessary to reasonably determine a "best explanation" for the cause of event *A*.

Origins Science is like forensic science that seeks to determine the cause of a death. Was the death more likely due to an accident, natural, or an intelligent cause (suicide or homicide) or do we lack the evidence sufficient to close the case in favor of one of those explanations? The difference is that in origins science we seek to explain the cause of life rather than the cause of a death.

Cleland recognizes that the methods of abductive reasoning used by criminal investigators are essentially the same as those used in Origins Science:

This places scientists investigating the remote past in the position of criminal investigators. Just as there are many different possibilities for catching a criminal, so there are many different possibilities for establishing what caused the demise of the dinosaurs, *the origin of the universe*, etc. Like criminal investigators, historical scientists collect evidence, *consider different suspects, and follow up leads. More precisely, they postulate differing causal etiologies for the traces they observe, and then try to discriminate from among them by searching for a 'smoking gun'—a trace(s) that identifies the most plausible culprit among the primary suspects. Unlike stereotypical criminal investigations, however, a smoking gun for a historical hypothesis merely picks out one hypothesis as providing the best explanation currently available; it need not supply direct confirming evidence for a hypothesis independently of its rivals.*²¹⁰

...

In the prototypical scenario, an investigator observes puzzling traces (effects) of long-past events. Hypotheses are formulated to explain them. The hypotheses explain the traces by postulating a common cause for them. Thus the hypotheses of prototypical historical science differ from those of classical experimental science insofar as they are concerned with event-tokens instead of regularities among event-types. This helps to explain the narrative character of many historical explanations. The complexity of the causal conditions and the length of the causal chain (connecting the cause to its current traces) bury the regularities in a welter of

210. *Id.* at 490 (emphasis added).

contingencies. Accordingly, it is hardly surprising that historical explanations often have the character of stories that, lacking reference to specific generalizations, seem inherently untestable. Nonetheless, it would be a mistake to conclude that hypotheses about the remote past can't be "tested."²¹¹

Cleland explains that the historical or forensic scientist tests or bases the "best explanation" on a clue or clues that will collectively rule in one hypothesis while ruling out the others. This is typically accomplished by finding a "smoking gun."

Instead of inferring test implications from a target hypothesis and performing a series of experiments, historical scientists *focus their attention on formulating mutually exclusive hypotheses and hunting for evidentiary traces to discriminate among them*. The goal is to discover a "smoking gun." A smoking gun is a trace(s) that unambiguously discriminates one hypothesis from among a set of currently available hypotheses as providing "the best explanation" of the traces thus far observed.²¹²

...

A smoking gun is a trace (or subcollection of traces) that (so-to-speak) cinches the case for a particular causal story. *A smoking gun does not, however, uniquely determine a hypothesis outside the context of a set of specific, competing hypotheses; it merely establishes that one of them is superior when it comes to causally explaining the traces thus far observed* Furthermore, it is always possible that future observations or theoretical developments will depose a smoking gun and that another hypothesis (new or old) will attain the status of the best explanation.²¹³

Most importantly, Cleland recognizes that the "[f]ailure to search for a smoking gun deprives a historical hypothesis of empirical grounding, turning it into a dreaded just-so story."²¹⁴

211. *Id.* at 480 (emphasis added).

212. *Id.* at 480–81 (emphasis added).

213. Carol Cleland, *Methodological and Epistemic Differences Between Historical Science and Experimental Science*, 69 PHIL. SCI. 474, 482 (2002) (emphasis added).

214. Carol Cleland, *Historical Science, Experimental Science, and the Scientific Method*, GEOLOGY, Nov. 2000, at 987, 990 (describing the difference between historical and experimental scientific methodology) (emphasis added).

Dreaded just-so stories are the effects of the Orthodoxy. It mandates a ban on any consideration of the teleological smoking guns that are littered throughout the history of the universe, including: (1) an apparently fine-tuned or designed-for-life universe and laws of physics and chemistry that can't be plausibly explained by chance or any material cause, (2) an "eerily perfect"²¹⁵ genetic code necessary and common to all life for which there is not even an idea of a possible materialistic explanation, (3) first life that requires unimaginably sophisticated genetic programming to exist and replicate and that is deemed materialistically "impossible" by at least one prominent origin of life scientist,²¹⁶ (4) the Cambrian explosion, (5) orphan genes with no detectable homologs, and (6) human consciousness.

Thus, the tunnel vision of the Orthodoxy effectively renders the materialistic narrative nothing more than a "dreaded just-so story" as it studiously avoids any consideration of an alternative supported by a number of significant smoking guns. According to Molecular and Cell biologist Jonathan Wells, this is "Zombi Science," not science that seeks to search for truths about the natural world.²¹⁷

As a consequence of both the nature of origins science as an historical science and use of the tunnel vision of MN in writing the history, the opinions regarding origins issued by modern institutions of science are not objective. Rather they reduce to "dreaded" materialistic/atheistic "just-so stories" required by the tunnel vision of a materialistic/atheistic Orthodoxy.

3. Modern Origins Science is Also Not Objective Because it Conceals the Use and Effect of Use of the Orthodoxy.
 - a. Modern science requires that the use and effect of use of key assumptions be adequately explained.

It would seem axiomatic that any objective explanation of a complex issue must include an adequate disclosure of the use and effect of use of any key assumption, particularly if the assumption relates to the education of an impressionable young mind by a state school about where the child comes from, the nature of the child's life, and how it should be lived ethically and

215. Simon Conway Morris devotes a sub-chapter to the extraordinary efficiency of the Genetic Code, which he calls "EERIE PERFECTION." MORRIS, *supra* note 112, at 13; see also Stephen J. Freeland & Laurence D. Hurst, *The Genetic Code is One in a Million*, 47 J. MOLECULAR EVOLUTION 238, 238-48 (1998).

216. See *supra* Section V.B.1.b.(2); Steven A. Benner, *Paradoxes in the Origin of Life*, 44 ORIGINS LIFE & EVOLUTION BIOSPHERES 339 (2014) (paper presented at the conference Open Questions on the Origin of Life, held July 12-13, 2014, by the International Institute for Advanced Studies (IIAS) in Kizugawa, Kyoto, Japan.).

217. WELLS, *supra* note 153.

morally. The child's beliefs about these ultimate issues will likely shape the child's religious worldview for life.

One may go to jail if a key assumption is concealed or not disclosed in connection with the purchase or sale of securities. Securities and Exchange Commission Rule 10b-5 makes it "unlawful for any person, directly or indirectly, . . . [t]o make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading . . . in connection with the purchase or sale of any security."²¹⁸

Deceptive Origins Science Education does not necessarily involve any immediate economic damage, rather, as discussed below, it involves a violation of the Constitutional rights of parents to direct the religious education of the child and the rights of their child to not be indoctrinated by a state school to accept a particular religious worldview.²¹⁹

Modern science also requires adequate disclosure of assumptions upon which an explanation is based. This is reflected in the *Framework for K-12 Science Education*²²⁰ and related *Next Generation Science Standard*²²¹ adopted in 2012 and 2013, respectively, now embraced by a majority of U.S. states.

*Because all models contain approximations and assumptions that limit the range of validity of their application and the precision of their predictive power, it is important to recognize their limitations.*²²²

. . . .

*Any model of a system incorporates assumptions and approximations; the key is to be aware of what they are and how they affect the model's reliability and precision. Predictions may be reliable but not precise or, worse, precise but not reliable; the degree of reliability and precision needed depends on the use to which the model will be put.*²²³

A primary use to which the materialistic/atheistic Origins Science model will be put is the formation of non-theistic religious worldviews by the entire

218. 17 C.F.R. § 240.10b-5 (2018).

219. See *infra* Section V.C.; *Edwards v. Aguillard*, 482 U.S. 578, 588-89 (1987); see also John Calvert, *Religious Rights of Parents and Students in US K-12 Public Education*, in *RELIGIOUS LIBERTY AND THE LAW: THEISTIC AND NON-THEISTIC PERSPECTIVES* 133 (Angus J.L. Menuge ed. 2018).

220. *Framework*, *supra* note 156, at 56.

221. *Standards*, *supra* note 157, at 81, 98, 120.

222. *Framework*, *supra* note 157, at 56 (emphasis added).

223. *Id.* at 93 (emphasis added).

human population. This would suggest the need for a high degree of precision.

Modern science also recognizes that assumptions are extremely complex, and should not be expected to be understood by primary and middle school students. “By *high school*, students should also be able to identify the assumptions and approximations that have been built into a model and discuss how they limit the precision and reliability of its predictions.”²²⁴ This affirms the need to delay origins science education until the ninth grade, although it now starts in kindergarten.

Rob Stadler, who holds a Ph.D. in biomedical engineering from Harvard, invents medical devices to improve health. In 2016, he published a book about the level of scientific confidence needed to have a device approved by the Food & Drug Administration as opposed to the level of scientific confidence in evolutionary theory. He discusses in detail “six criteria of high confidence science:” (1) repeatability, (2) directly measurable, (3) prospective, interventional study, (4) careful to avoid bias, (5) careful to avoid assumptions (if assumptions are used they must be disclosed and justified), and (6) sober judgement of results.²²⁵

He concludes that although micro-evolutionary theory may be based in part on high confidence science, macro-evolutionary theory is not. For Stadler chemical evolution is nothing but a “faith-based” idea. He also explains the distinction between historical and experimental science:

Here is one of the most important points in this book: by controlling confounding variables, well-conducted prospective interventional experiments are able to conclude causality, that is determine what caused the results that were observed. Retrospective [historical] observational studies are not able to control variables and therefore can only *suggest associations*, not conclude causality.²²⁶

He also explains that “high confidence science, and good scientists, must make every effort to exclude bias.” With regard to assumptions, he explains that if one is made, “it is very important that I follow up with two actions. First, I need to acknowledge this assumption in my description of the

224. *Id.* at 94 (emphasis added).

225. ROB STADLER, *THE SCIENTIFIC APPROACH TO EVOLUTION: WHAT THEY DIDN'T TEACH YOU IN BIOLOGY* 7–24 (2016).

226. *Id.* at 14 (emphasis added).

experiment. Second, I need to include a justification for making the assumption”²²⁷

Thus, it is imperative that the use and effect of use of the Orthodoxy be adequately disclosed in “scientific” explanations about where we come from and the nature of life. Our religious worldviews depend on it.

- b. Although modern science requires adequate disclosure of the orthodoxy, its practice is to conceal its use and the effect of its use.

The concealment of the Orthodoxy occurs through omission and misrepresentation. The *Framework* acknowledges that the Orthodoxy is used in the generation of the *Standards*. However, the *Standards* omit to direct students to be informed of that use in the *Standards* relating to origins and behavioral science. In addition, disclosure of the use in the *Framework*, is very subtle and not couched in terms of “scientific materialism” or “methodological naturalism.” Instead, the *Framework* uses the label of “mechanism” rather than “materialism” or “naturalism.”

This is deceptive, because, to the uninitiated, the idea to look for a mechanism seems eminently reasonable, as a mechanism colloquially does not necessarily exclude a mind or an intelligent cause. However, “mechanism” is “a philosophical doctrine that holds that natural processes and especially the processes of life are mechanically determined and capable of complete explanation by the laws of physics and chemistry—compare TELEOLOGY, VITALISM.”²²⁸ Thus, “mechanism.” “materialism” and “naturalism” are functionally synonymous. This doctrine excludes the intervention of any intelligent cause and provides the foundation for Atheism, Religious (“secular”) Humanism and other non-theistic religions. Accordingly, the *Framework* and *Standards* limit explanations of the cause of any event in the natural world to only those caused by a “mechanism,” or as explained by Dr. Lewontin, by a “material cause.”²²⁹

The use of the Orthodoxy is superficially acknowledged in the *Framework*:

227. *Id.* at 18.

228. See WEBSTER’S UNABRIDGED DICTIONARY (2014).

229. See *supra* Section V.B.1.a.; see also Richard C. Lewontin, *Billions and Billions of Demons*, 44 N.Y. REV. BOOKS 31 (1997).

2. *Cause and effect: Mechanism and explanation.* Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and *explaining causal relationships* and the *mechanisms* by which they are mediated.²³⁰

Additionally,

In this way, *the physical sciences—physics and chemistry—underlie all natural and human created phenomena*, although other kinds of information transfers, such as those facilitated by the genetic code or communicated between organisms, may also be critical to understanding their behavior. An overarching goal for learning in the physical sciences, therefore, is to help students see that there are *mechanisms of cause and effect in all systems and processes that can be understood through a common set of physical and chemical principles.*²³¹

Although use of the Orthodoxy is subtly acknowledged in the *Framework*, no standard calls for students to be educated about its use and the effect of its use on Origins Science explanations to be learned and embraced. One step in such education would actually be quite easy. The textbook could simply append Lewontin's candid explanation²³² to each discussion of origins science. Other essential steps include adequate curricula that explain the teleological alternative that is banned and the evidence that supports it and that contradicts the materialistic explanations ordained by the Orthodoxy as suggested in Section VI *infra*.

- c. Rather than disclose the use of the orthodoxy and its effects on explanations of ultimate religious issues, modern science and the Standards conceal its use and effect through material misrepresentations and omissions.

The concealed use of the preconception is evident. NGSS Appendix H, page 5 shows a progression that causes five-year olds to begin to "search for cause and effect relationships to explain natural events," including the cause of life. Beginning in the third grade the child learns that "mechanisms" explain the cause of those events: "Science explanations describe the mechanisms for natural events." The problem is the child does not know or realize that there is embedded in this simple statement that seems quite reasonable a very deep and overarching materialistic/atheistic orthodoxy that

230. *Framework*, *supra* note 156, at 84 (second and third emphasis added).

231. *Id.* at 103 (emphasis added).

232. *See supra* Section V.B.1.

will lead the child to eventually accept that everything in the natural world is explained by material causes and not by any intelligent cause. The presupposition is to be inculcated as a fact incrementally, progressively and comprehensively for thirteen years, but never objectively disclosed. If the child's life is reduced to a mere fortuitous occurrence it has no inherent purpose as only a mind, not matter, can produce purpose.

The following are a number of examples of misrepresentations in the *Framework* and *Standards* that have the effect of concealing the use and effect of use of the Orthodoxy.

Misrepresentations that scientific explanations are consistent with all the evidence and are intellectually honest when the Orthodoxy mandates the contrary, particularly in origins science:

Scientific explanations are (a) “consistent with the available evidence”²³³ (b) “[o]pen to [r]evision in [l]ight of [n]ew [e]vidence,”²³⁴ (c) “guided by a set of values to ensure accuracy of measurements, observations, and *objectivity*,”²³⁵(d) “guided by habits of mind such as intellectual honesty, tolerance of ambiguity, skepticism and openness to new ideas,”²³⁶ and (e) are based on “empirical standards, logical arguments, and skeptical review.”²³⁷

The goal is to ensure that children develop an acceptance of the “beauty and wonder of [materialistic/atheistic] science:”

The overarching goal of our framework for K-12 science education is to ensure that by the end of 12th grade, all students have some appreciation of the beauty and wonder of science; possess sufficient knowledge of science and engineering to engage in public discussions on related issues; are careful consumers of scientific and technological information related to their everyday lives; are able to continue to learn about science outside school; and have the skills to enter careers of their choice, including (but not limited to) careers in science, engineering, and technology.²³⁸

This *view* is to be incorporated into their “scientific worldview,” which is materialistic/atheistic due to the Orthodoxy. “*To capture the vision in the Framework, students should be assessed on the extent to which they have*

233. *Framework*, *supra* note 156, at 52 (emphasis added).

234. *Standards*, *supra* note 157, app. H, at 5 (2013).

235. *Id.* (emphasis added).

236. *Id.* at 6 (emphasis added).

237. *Id.*

238. *Framework*, *supra* note 156, at 1 (emphasis added).

*achieved a coherent scientific worldview [that is materialistic/atheistic].”*²³⁹ “These [crosscutting] concepts help provide students with an organizational framework for connecting knowledge from the various disciplines into a coherent and *scientifically* [materialistically/atheistically] *based view of the world.*”²⁴⁰

However, because of the use of the Orthodoxy, the word "scientific" is actually synonymous with materialistic/atheistic. The worldview is really not scientific because that Orthodoxy closes the mind to any evidence that undermines the Orthodoxy or supports the banned teleological alternative.

The subtle concept is also embedded in the standards through the use of hidden extrapolations, false dichotomies, and false descriptors.

The conflation of microevolution and macroevolution under the single label of “evolution,” conceals the fact that the strong evidentiary basis for microevolution is being extrapolated to support the ordained imaginative and conjectural evidentiary basis for macroevolution.²⁴¹

A key false dichotomy is that that all systems can be divided into two kinds: living systems which are “natural,” and human made systems which are designed: “The shape and stability of structures of *natural and designed objects* are related to their function(s).”²⁴²

A dichotomy takes a single group or class like all objects and then divides it into two distinct classes, one of which lacks an attribute of the other. In this case, the dichotomy of “natural and designed objects” subtly teaches impressionable children that natural objects lack the attribute of design that inheres in human made objects. However, the dichotomy is false, since that is not actually the case, as everyone agrees that living systems appear designed and much objective evidence actually supports that inference. This false dichotomy reflects a concealed use of the Orthodoxy.

The use of this false dichotomy is one of many subtle tools that likely indoctrinate many students, parents and taxpayers to believe that life is just the product of material causes and that one’s intuition that it is due to an intelligent cause happens to be wrong. Others may conclude that their theistic religions are built on a faulty premise that life is a creation made for a purpose. Of course, the message is not that explicit. A subtle and continuous use of the hidden preconception over thirteen years should be expected to be far more effective.

239. *Standards, supra* note 157, app. G at 3 (2013) (emphasis and bracketed text added).

240. *Framework, supra* note 156, at 83 (emphasis and bracketed text added).

241. *See supra* Section V.B.1.b.(4)(b).

242. *Standards, supra* note 157, at 14 (emphasis added).

The *Framework* and *Standards* also use descriptors that implicitly classify the natural world as just "material," consistent with the materialistic tenet of the Orthodoxy: "[s]cientists study the *natural and material* world."²⁴³

Under this descriptor, the word "material" describes the natural world. The subtle message is that the natural world is just material. Of course, the descriptor is false as we do know that living systems incorporate non-material complex functional/semantic information. There actually appear to be many non-material entities, including the genetic code, "genetic programming,"²⁴⁴ that generates, operates, maintains and organizes the processes of living systems and human consciousness. The fine-tuning of the universe also implies the existence of an immaterial mind that may have designed the entirety of the natural world.

The statements that natural objects, systems, and structures are just material or physical substances that just occur and are not designs made for a purpose, are not facts. As explained by Judge Hand in the *Smith v. Board of Education*, they are faith-based assumptions that reflect "*the commitment of humanists to a non-supernatural and non-transcendent analysis, even to the point of hostility towards and outright attacks on all theistic religions.*"

*Dr. Paul Kurtz testified that secular humanism is a scientific methodology, not a religious movement Dr. Kurtz's attempt to revise history to comply with his personal beliefs is of no concern to this Court For first amendment purposes, the commitment of humanists to a non-supernatural and non-transcendent analysis, even to the point of hostility towards and outright attacks on all theistic religions, prevents them from maintaining the fiction that this is a non-religious discipline. This Court is concerned with the logic and consistency, the rationality, one might say, of Dr. Kurtz's contention that secular humanism is not a religious system, but science. Secular humanism is religious for first amendment purposes because it makes statements based on faith-assumptions.*²⁴⁵

The *Framework* and *Standards* also use the false descriptor of "natural selection" to mislead the public and children into the false belief that the physics and chemistry that drive evolutionary theory have the capacity of a

243. *Id.* at 15 (emphasis added).

244. *Framework, supra* note 156, at 139 ("Life is self-contained, self-sustaining, self-replicating, and evolving, operating according to laws of the physical world, as well as genetic programming.").

245. *Smith v. Bd. of Sch. Comm'rs of Mobile Cty.*, 655 F. Supp. 939, 982 (S.D. Ala. 1987) (emphasis added), *rev'd on other grounds*, 827 F.2d 684 (11th Cir. 1987).

human mind that can “select” one of a variety of alternatives due to its capacities of memory, thought, self-awareness and forethought. Purely physical systems lack all of these capacities.

The “natural selection” descriptor is false because the mechanism it describes is one which physically sorts, not selects or chooses, as the postulated mechanism lacks an actual mind and the capacity to “choose.” It consists merely of the effects of random changing environmental constraints that tend to positively sort or enhance the survival of organisms that happen by chance to be most fit for those constraints.

The misrepresentation that this mindless mechanism “selects” is also materially misleading because it leads one to believe that a mindless materialistic mechanism has the capacity of a mind that can therefore explain the apparent design of living systems, when much of the observable evidence suggests not.

Ironically, devout materialists also complain about the use of misleading metaphors or descriptors. They classify as misleading those “metaphors” which describe living systems as “machines” that run on “information.” The irony is that the so-called “metaphor” is in fact accurate. However, many materialists don’t like the metaphor because it suggests that the system is designed, when in fact, due to the Orthodoxy, it’s not. Per the Orthodoxy living systems are not designed “machines,” rather they are just material entities or mechanisms that just occur due to the laws of physics and chemistry and chance. Recently, Professor of Philosophy Massimo Pigliucci suggested that because “the machine information metaphors have been grist to the mill of ID creationism, fostering design intuitions and other *misconceptions* about living systems, we think it is time to dispense with them altogether.”²⁴⁶tat

Thus, rather than disclose the use and effect of use of the Orthodoxy and its effects on explanation as to the enormously important issue of the cause and the nature of life, modern science and the *Standards* conceal its use and the effect of its use through misrepresentations and omissions.

246. Massimo Pigliucci, *Why machine-information metaphors are bad for science education, part II: the search for new metaphors*, FOOTNOTES TO PLATO (Mar. 19, 2018), <https://platofootnote.wordpress.com/2018/03/19/why-machine-information-metaphors-are-bad-for-science-education-part-ii-the-search-for-new-metaphors/>; see also Massimo Pigliucci, *Why machine-information metaphors are bad for science education, part I: biological machines and intelligent design*, FOOTNOTES TO PLATO (Mar. 13, 2018), <https://platofootnote.wordpress.com/2018/03/13/why-machine-information-metaphors-are-bad-for-science-education-part-i-biological-machines-and-intelligent-design/>.

- d. The fact of the concealment indicates the weakness of the orthodoxy itself.

Typically, concealments through misrepresentation and omission are used to hide a weakness. The weakness is that the teleological evidentiary smoking guns are ubiquitous in the natural world. Accordingly, to effect acceptance of the materialistic/atheistic religious worldview that is called “scientific,” the evidence against it must be hidden. It should be obvious that modern Origins Science is dogmatic, not objective.

C. *It is Constitutionally, Scientifically, and Educationally Necessary to Teach Origins Science Objectively.*

1. It is Constitutionally Necessary to Teach Religious Issues Objectively Because Parents Have the Exclusive Right to Direct the Religious Education of Their Children, and Students Have the Right to Not Be Indoctrinated by the State with Respect to a Particular Religious View.

The use of a theistic orthodoxy in state education that favors a theistic view of origins over a non-theistic view has been held to be a violation of the Establishment Clause in numerous cases, including *Epperson v. Arkansas*, *Edwards v. Aguillard*, and *Lee v. Weisman*.²⁴⁷ Since religion includes non-theistic belief systems, the same result should logically follow for the concealed use of the materialistic/atheistic Orthodoxy that favors non-theistic views on ultimate religious issues over theistic views.

This result should be particularly the case for the consumers of that education, the children and parents whose distinct religious rights are affected by the indoctrination. In *Edwards v. Aguillard*, the Supreme Court established that the parents, not the state, have the exclusive right to direct the religious education of their children, and the child has the right to not be indoctrinated by the state to accept a particular religious view.²⁴⁸ The rights are discussed in more detail in *Religious rights of parents and students in U.S. K-12 public education*.²⁴⁹

The rights arise under the First and Fourteenth Amendments of the U.S. Constitution. The First Amendment states that “Congress shall make no law

247. *Epperson v. Arkansas*, 393 U.S. 97, 109 (1968); *Edwards v. Aguillard*, 482 U.S. 578, 588–89 (1987); *Lee v. Weisman*, 505 U.S. 577, 617 (1992).

248. *Edwards v. Aguillard*, 482 U.S. 578, 588–89 (1987).

249. John Calvert, *Religious Rights of Parents and Students in US K-12 Public Education*, in *RELIGIOUS LIBERTY AND THE LAW: THEISTIC AND NON-THEISTIC PERSPECTIVES* (Angus J.L. Menuge ed., 2018).

respecting an establishment of religion, or prohibiting the free exercise thereof, or abridging the freedom of speech."²⁵⁰ A century later, after the Civil War, the Fourteenth Amendment was adopted. It prohibits a state from depriving "any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws."²⁵¹ In 1940, the Supreme Court held in *Cantwell v. Connecticut* that the Fourteenth Amendment caused the First Amendment to be applicable to not just the Federal "Congress," but also to any state or local governmental agency.²⁵²

Since *Cantwell* the Supreme Court has effectively construed the First and Fourteenth Amendment together to mean that *no governmental agency, whether federal, state or local, shall make any law or policy* respecting an establishment of religion, or prohibiting the free exercise thereof, or abridging the freedom of speech. This has the effect of requiring all public K-12 schools to be secular and neutral with respect to "religion."

Following *Epperson's* requirement that religious issues be taught objectively,²⁵³ the Supreme Court in *Edwards* ruled on a case brought by parents and others complaining about a state law that required public schools to teach "Creation Science" whenever the "theory" of evolution is taught. Creation Science was found to be an investigation to find evidence that supports a "particular interpretation of the Book of Genesis by a particular religious group."²⁵⁴ Because of the non-theistic Orthodoxy that guides it, modern origins science is conceptually similar to Creation Science. That is,

250. U.S. CONST. amend. I.

251. U.S. CONST. amend. XIV.

252. *Cantwell v. Connecticut*, 310 U.S. 296, 303 (1940).

253. *Epperson v. Arkansas*, 393 U.S. 97,106-7 (1968); *see supra* Section IV.A.

254. *Edwards v. Aguillard*, 482 U.S. 578, 593 (1987). *See also id.* at 596 n.18 ("Of this group, the largest proportion of superintendents interpreted creation science, as defined by the Act, to mean the literal interpretation of the Book of Genesis."). "The 'overriding fact' that confronted the Court in *Epperson* was 'that Arkansas' law selects from the body of knowledge a particular segment which it proscribes for the sole reason that it is deemed to conflict with . . . a particular interpretation of the Book of Genesis by a particular religious group.'" *Epperson v. Arkansas*, 393 U.S. 97, 103 (1968). Similarly, the Creationism Act is designed either to promote the theory of creation science which embodies a particular religious tenet by requiring that creation science be taught whenever evolution is taught or to prohibit the teaching of a scientific theory disfavored by certain religious sects by forbidding the teaching of evolution when creation science is not also taught. The Establishment Clause, however, 'forbids alike the preference of a religious doctrine or the prohibition of theory which is deemed antagonistic to a particular dogma. *Id.* at 106-107 (emphasis added). Because the primary purpose of the Creationism Act is to advance a particular religious belief, the Act endorses religion in violation of the First Amendment."

modern science education teaches only the evidence that favors and supports the Orthodoxy's materialistic/atheistic worldview.

Teleology is not Creation science. It is an essential part of an investigation conducted per the scientific method to collect relevant evidence that will yield an inference to the best of the competing teleological and materialistic hypotheses about the origin of the cosmos, of life and the diversity of life. It is not rooted in any dogma or orthodoxy in any religious text. As described above, teleology is a logical inference drawn from observable evidence. The case of a prosecutor in a murder trial is teleological.

This is not to say that a teleological inference is without religious implications. Both materialistic and teleological inferences have religious implications due to the religious issues addressed by Origins Science itself.

Although Creation Science was found in *Edwards* to promote a particular theistic orthodoxy, there was no contention that evolution was based on the Orthodoxy of Methodological Naturalism. To the contrary, it was described by the Court as a "theory" that implicitly is conducted and taught objectively.²⁵⁵ Similarly in the case of *Seagraves v. California* the court issued its ruling in favor of the teaching of evolution on the basis of a representation that evolution—origins science—is conducted objectively and not dogmatically:

Court, "And, moreover, science is not dogmatic in that it is open ended and there is an absence of preset conclusions?" The witness, "Yes, sir." I commend this, to the State Board of Education, as a beautiful and pertinent statement of what science is all about, as a layman.²⁵⁶

The representation to the Court may have been true thirty-eight years ago. However, as reflected in the *Framework* and *Standards*, it is not true in 2018.²⁵⁷

In ruling for the parents, the *Edwards* Court explained that the parent, not the state, has the exclusive right to direct the religious education of the student, and that the student has the right to not be indoctrinated by the state

255. *Edwards v. Aguillard*, 482 U.S. 578, 588-89 (1987) ("If the Louisiana Legislature's purpose was solely to maximize the comprehensiveness and effectiveness of science instruction, it would have encouraged the teaching of all scientific theories about the origins of humankind. But under the Act's requirements, teachers who were once free to teach any and all facets of this subject are now unable to do so.") (emphasis added).

256. *Seagraves v. State of California*, No. 278978, slip op. at 9 (Sacramento Super. Ct. 1981), available at http://ncse.com/webfm_send/1062.

257. See *supra* Section V.B.3.c.

to accept a particular religious view. To protect those rights the court established a trust:

The Court has been particularly vigilant in monitoring compliance with the Establishment Clause in elementary and secondary schools. Families *entrust* public schools with the education of their children, *but condition their trust on the understanding that the classroom will not purposely be used to advance religious views that may conflict with the private beliefs of the student and his or her family*. Students in such institutions are impressionable and their attendance is involuntary.²⁵⁸

The religious rights of parents and students especially arise in the context of an Establishment Clause violation where the state is establishing a theistic or non-theistic religious “orthodoxy.”²⁵⁹ At least eight Supreme Court cases and six Circuit Court cases recognize the parent and student religious rights explained by *Edwards*.²⁶⁰

All of the cases hold that public education may not promote a religious orthodoxy or preference. Since the materialistic/atheistic Orthodoxy used by modern origins science gives a preference to non-theistic religion, then the only way a public school may teach modern origins science in a public K-12 school is to teach it objectively so that the teaching produces a religiously neutral effect. Objectivity will, as a minimum, require adequate explanations of the use and effect of use of the Orthodoxy as suggested in Section VI, *infra*. Alternatively, the state or school may choose not to teach origins science at all.

258. *Edwards v Aguillard*, 482 U.S. 578, 583-84 (1987) (emphasis added) (citations omitted).

259. *Lee v. Weisman*, 505 U.S. 577, 592 (1992) (“A state-created orthodoxy puts at grave risk that freedom of belief and conscience which are the sole assurance that religious faith is real, not imposed.”).

260. See *McCullum v. Board of Education*, 333 U.S. 203, 205-06 (1948); *Engel v. Vitale*, 370 U.S. 421, 424 (1962); *Abington Sch. Dist. v. Schempp*, 374 U.S. 203, 224-25 (1963); *Valley Forge Christian College v. AUSCS*, 454 U.S. 464, 486 (1982); *Wallace v. Jaffree*, 472 U.S. 38 (1985); *Edwards v. Aguillard*, 482 U.S. 578, 584-85 (1987); *Lee v. Weisman*, 505 U.S. 577, 584; (1992); *Elk Grove Unified School District v. Newdow*, 542 U.S. 1, 17-18 (2004) (provided the parent has legal custody of the child). See also *Bell v. Little Axe ISD*, 766 F.2d 1391, 1398 (10th Cir. 1985); *Fleischfresser v. Dir. of Sch. Dist.* 200, 15 F.3d 680, 683-84 (7th Cir 1994); *Moss v. Spartanburg CSD Seven*, 683 F.3d 599, 607 (4th Cir. 2012); *Steele v. Van Buren Public School Dist.*, 845 F.2d 1492, 1495 (8th Cir. 1988); *Doe v. Beaumont ISD*, 240 F.3d 462, 466 (5th Cir. 2001); *Grove v. Mead Sch. Dist. No. 354*, 753 F.2d 1528, 1531-32 (9th Cir.1985); *Sullivan v. Syracuse Housing Authority*, 962 F.2d 1101, 1109-10 (2d Cir. 1992).

2. It is Scientifically Necessary to Teach Origins Science Objectively.

The scientific necessity for teaching origins science objectively is explained *supra* at V.B. Assumptions must be adequately disclosed and justified. However, there is actually a greater necessity. Use of the Orthodoxy when seeking explanations about where we come from and the nature of life and how it should be lived address ultimate religious questions. Even if adequately disclosed, scientific inquiry itself becomes a non-theistic religious enterprise rather than a truly objective, open minded enterprise that seeks truths rather than particular answers to religious issues. To avoid that classification, institutions of science must, as a minimum, adequately and objectively explain its use and the effect of the use of the Orthodoxy before the schools are asked to teach about it.

3. It is Educationally Necessary to Teach Origins Science Objectively.

The *Framework* and *Standards* are built around the concept of students engaging in objective critical thinking, which starts with the necessity for students to ask and seek answers to questions:

- (1) *Asking questions* (for science) and defining problems (for engineering)
- (2) Developing and using models
- (3) *Planning and carrying out investigations*
- (4) *Analyzing and interpreting data*
- (5) Using mathematics and computational thinking
- (6) *Constructing explanations* (for science) and designing solutions (for engineering)
- (7) *Engaging in argument from evidence*
- (8) Obtaining, evaluating, and *communicating information*.²⁶¹

In Origins Science, the entire idea is undermined by the use of the concealed overarching Orthodoxy that bans any question that contradicts its materialistic/atheistic preconception. As a consequence, to implement the critical thinking practices it is educationally necessary to adequately explain the use and effect of use of the Orthodoxy. Adequate information will allow cognitively mature and knowledgeable students to conduct investigations that may yield evidence contradictory to the Orthodoxy. Otherwise the standards become a tool of indoctrination in a non-theistic religious worldview.

261. *Framework, supra* note 156, at 49. (emphasis added).

VI. SUGGESTIONS FOR THE OBJECTIVE TEACHING OF SCIENCE THAT
ADDRESSES RELIGIOUS ISSUES

A. *Essentials for an Objective Teaching of Modern Origins Science in K-12
Public Schools.*

The development of objective Origins Science educational standards will require the input of numerous experts. The experts must necessarily include scientists who have professionally questioned the use of the Orthodoxy and have collected and analyzed evidence that is inconsistent with its two claims that only material causes have operated to form the universe and everything in it and that the competing evidence-based teleological hypotheses is invalid.

It will not be an easy process. However, to achieve the required neutrality, objectivity seems critically necessary for K-12 public science education that address ultimate religious questions. The subject is discussed in more detail in *Religious Rights of Parents and Students in US K-12 Public Education* and *Kitzmiller's Error*.²⁶²

An objection will be that a number of cases have ruled that “evolution” cannot be questioned. However, none of these cases have dealt with the Orthodoxy, other than *Kitzmiller*. As explained in *Kitzmiller's Error*,²⁶³ the *Kitzmiller* decision is based on the use of an erroneous definition of religion. When the required inclusive definition of religion is applied to the facts the objective policy adopted by the Pennsylvania school board becomes necessary rather than unconstitutional. For reasons previously explained, *Epperson* and *Edwards* both require objectivity rather than orthodoxy. In *Seagraves*²⁶⁴ and *Pelozza*²⁶⁵ the Courts were told or assumed that the Orthodoxy was not used in the teaching of evolution. That may have been the case in 1982 and 1994, but it is not the case today.

Given the religious issues addressed by Origins Science, the required neutrality makes objectivity essential. The following are believed to be

262. John Calvert, *Religious Rights of Parents and Students in US K-12 Public Education, in RELIGIOUS LIBERTY AND THE LAW: THEISTIC AND NON-THEISTIC PERSPECTIVES*, (Angus J.L. Menuge ed., 2018); see generally John Calvert, *Kitzmiller's Error: Defining “Religion” Exclusively Rather Than Inclusively*, 3 LIBERTY U. L. REV. 213 (2009).

263. Calvert, *supra* note 45, at 306-327.

264. *Seagraves v. State of California*, No. 278978, slip op. at 9 (Sacramento Super. Ct. 1981) (“Court, ‘And, moreover, science is not dogmatic in that it is open ended and there is an absence of preset conclusions?’ The witness, ‘Yes, sir.’ I commend this, to the State Board of Education, as a beautiful and pertinent statement of what science is all about, as a layman.”).

265. *Pelozza v. Capistrano Unified Sch. Dist.*, 37 F.3d 517 (9th Cir. 1994).

necessary elements of a minimal set of objective Origins Science educational standards:

(1) *Students should be informed of the religious issues that arise from the questions the science curriculum lead them to ask: where do we come from? What is the nature of life? What happens when it ends? How should we live our lives ethically and morally?* Any origins curriculum should first inform students about the religious issues at stake and the competing religious tenets that rely on the competing materialistic and teleological explanations. They should know that any study of Origins Science involves profound and complex scientific and religious issues. They should also understand why a religiously neutral state school must teach the issues objectively. Finally, they should know that the school is required to protect their religious right to make their own informed choice about what to believe, consistent with any religious education and training provided by their parents. In this respect the school may not advocate for or against any particular origins science explanation.

(2) *Origins Science cannot be taught objectively to cognitively immature, unknowledgeable and impressionable minds.* The issue of origins science is extremely complex and potentially harmful to a child's developing worldview, whether theistic, atheistic or pantheistic. Therefore, to achieve objectivity and neutrality it should only be covered with age-appropriate audiences, where students are cognitively mature, knowledgeable and have already formed their worldview at home.²⁶⁶ To be knowledgeable, students should have first mastered courses in math, chemistry, and physics as well as basic curricula in astronomy, biology and earth/space science with the issue of origins omitted. Instruction in basic statistics and the calculation of probabilities should also be a prerequisite. This is necessary as the core issue in Origins science is the plausibility of random events to account for the

266. See *Bell v. Little Axe ISD*, 766 F.2d 1391, 1404 n. 11 (10th Cir. 1985). “Dr. Thomas J. Berndt, a specialist on psychological development of children and adolescents, testified on behalf of plaintiffs that a child between the ages of 6 and 11 does not have the cognitive ability to ‘appreciate the difference between his point of view and that of somebody else. It’s as if he simply assimilates and takes, unthinkingly, what other people have taught to him.’” Children at this age are particularly influenced by authority figures, including teachers. *Id.* at 210. As children move into their adolescent years, ages eleven to fifteen, peer influence takes on increasing weight. *Id.* at 211. It is not until the age of eighteen that the child fully develops the ability to make decisions independent of authority figures and peers. *Id.* at 212. (Defendants’ expert, Dr. Paul Schmidt, a clinical psychologist, basically agreed with this view of child development). The Framework also recognizes that students do not achieve the ability “to identify the assumptions and approximations that have been built into a model and discuss how they limit the precision and reliability of its predictions” until high school. *Framework*, *supra* note 156, at 94.

origin of the universe, life and the diversity of life. The questions students should ask and answer is whether chance explanations of a cause are statistically plausible within the available time. As a practical matter, it may be a course that should be deferred until the eleventh or twelfth grade, in high school.

(3) *Origins Science should be Optional.* Origins Science should be an elective as neither the teleological or materialistic explanations are consistent with origins narratives contained in some religious texts. Even if the curriculum is supposed to be objective, it likely will not actually meet that standard as all teachers will have a personal bias. Furthermore, many parents may not want their children to consider scientific alternatives to religious tenets that the parents want them to firmly believe. Children should be required to take operational science, but not historical origins science.

(4) *Students should understand that the Question of Origins is an unsolved mystery – a case not closed that may never be scientifically closed.* As a prerequisite, students should understand that modern science does not know the cause of the universe, of life and all the diversity of life. Furthermore, the issue turns on more than scientific evidence. What we believe about where we come from depends in major part on our own subjective experiences and biases that are not intersubjectively accessible to others. A book recently published by a neurosurgeon recalls a near death experience that is extraordinarily subjective.²⁶⁷ The experience caused the scientist to switch from atheism to theism. Some believe Jesus was a fraud, while others recount deep personal experiences with him that are not inter-subjectively accessible. Furthermore, the law precludes the school from telling a student which religious idea is valid.²⁶⁸ So, the entire idea of a public school curriculum about origins should be to keep the mind of the child open. This requires a program that will truly inform rather than indoctrinate.

(6) *The Standards should require that students have an adequate knowledge and understanding that (a) materialistic Origins Science explanations of Modern Science are based on the use of the Orthodoxy and (b) the effect of that use on the adequacy of the explanations provided.* Due to the objectivity and neutrality required by the Constitution, the requirements of science to adequately disclose and justify key assumptions, and the needs of public education to instill critical thinking, the purpose use and effect of use of the Orthodoxy must be adequately explained to age-appropriate students who receive Origins Science instruction. This includes standards that require

267. EBEN ALEXANDER, M.D., *PROOF OF HEAVEN: A NEUROSURGEON'S JOURNEY INTO THE AFTERLIFE* (2012).

268. See Calvert, *supra* note 45, at 248; *United States v. Ballard*, 322 U.S. 78, 87 (1944).

teaching about the evidence and logical inferences from the evidence that tend to support or contradict the Orthodoxy. It also includes objective teaching about evidence and logical inferences from the evidence that tend to support or contradict the competing teleological alternatives for the origin of the Universe, of the laws of physics and chemistry, of life and the diversity of life. In particular, standards should require that students know and understand that origins science is an historical science that depends on abductive reasoning that requires a consideration of competing alternatives and that the Orthodoxy violates that logic by banning the evidence-based teleological alternative so that only materialistic/atheistic explanations are permitted.

(7) *Teach the difference between historical and experimental science and the method of reasoning employed by both.* A good way to do this is to compare the methods of historical science with the methods of operational science. Forensic science employs both. It performs scientific analysis of clues like blood analysis to link blood to a particular individual or to find out what might have been consumed by the victim prior to death. It then uses the methods of historical science to link the clues into a narrative that best explains the unobserved cause or causes of a particular event like a death. Historical science is used to fill gaps in our knowledge that cannot be observed or duplicated in the lab. It depends on a rigorous competition of rival ideas and a search for clues that will collectively rule in one idea while ruling out the others.

(8) *Require that Origins Science Curricula strive to teach students the actual state of our scientific knowledge about origins as defined by Daubert v. Merrill Dow without application of any orthodoxy.* The curriculum should be limited to origins explanations based on inferences drawn from intersubjective accessible evidence developed per the scientific method.²⁶⁹ Thus it should seek to inform students of the actual state of our scientific knowledge regarding origins. This excludes a discussion of narratives drawn from religious texts such as the Bible, Koran, Torah, Hindu Vedas, the Humanist Manifestos, etc.

(9) *Require that curriculum be posted on websites made available to parents, students and taxpayers.* Transparency is essential. It gives parents

269. See Calvert, *supra* note 45, at 280-83; Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 590 (1993). According to *Daubert*, for an inference or assertion to qualify as scientific knowledge, it must be derived by the scientific method rather than a preconception. *Daubert* explains that true science seeks the most “reliable” explanations rather than explanations that seek to reach a pre-ordained conclusion. The Court pointed out that the focus should be “on principles and methodology, not on the conclusions that they generate.” *Id.*

and other stakeholders the opportunity to assess the objectivity of the curriculum. Complaints will cause schools to improve the curriculum. Eventually, the process should result in a consensus about what is objective and neutral.

As one can see, the cost of constitutional public education may be high if it is to deal with religious issues. However, given our Constitution, there seems to be no alternative if parents are effectively required to place their children in the care and trust of the state.

B. Teaching Other Subjects That Deal With How Life Should be Lived Ethically and Morally.

Origins science explanations responsive to the first two ultimate religious issues (where do we come from and what is the nature of life) will significantly impact how we answer the third ultimate question—how should life be lived ethically and morally. Are we creations made for a purpose or are we just accidents of randomly occurring interactions of matter, energy and the forces per the laws of physics and chemistry? Although the *Framework* and *Standards* do not deal with specific moral issues, they teach a materialistic/atheistic worldview that is expected to cohere with all other subjects²⁷⁰ and that is expected to influence the student's personal and civic decision making. The preface to the *Framework* explains that “[t]he understanding of, and interest in, science and engineering that its citizens bring to bear in their personal and civic decision making is critical to good decisions about the nation's future.”²⁷¹ Clearly it is designed to influence “their individual lives and their roles as citizens:

The framework principally concerns itself with the first task—what all students should know in preparation for their individual lives and for their roles as citizens in this technology-rich and scientifically complex world [U]nderstanding science and engineering . . . is essential for every American citizen. [As it is necessary for them to make] informed everyday decisions [and it] can be meaningful and relevant on a personal level, opening new worlds to explore and offering lifelong opportunities for enriching people's lives.²⁷²

270. *Framework*, *supra* note 156, at 306.

271. *Id.*

272. *Id.* at 7, 10 (emphasis and bracketed text added).

[A] major goal for science education should be to provide all students with the background to systematically investigate issues related to their personal and community priorities. They should be able to frame scientific questions pertinent to their interests, conduct investigations and seek out relevant scientific [materialistic/atheistic] arguments and data, review and apply those arguments to the situation at hand, and communicate their scientific understanding and arguments to others.²⁷³

Because the Orthodoxy applies to all “sciences,” it is also foundational in health and social sciences that deal with issues of ethics and morality. Health science teaches Comprehensive Sex Education which deals with issues all religions address relating to human sexuality, marriage, family, and the sanctify of life (e.g., abortion). National Sex Education standards teach about these issues but only from a non-theistic perspective.²⁷⁴

Social science covers a number of subjects that address religious issues, including civics and the morals and ethics deemed necessary to be a “good citizen.” These include issues regarding human sexuality, discrimination, family, care for the environment, and “social justice,”²⁷⁵ a tenet of Religious (“secular”) Humanism.²⁷⁶

Nancy Pearcey, a best-selling author and Professor of apologetics at Houston Baptist University, explains the effect of a materialistic/atheistic view of the body on the resulting ethics and morality of a culture in *Love Thy Body: Answering the Hard Questions about Life and Sexuality*.²⁷⁷ When the body lacks intrinsic purpose, then it may be used however one pleases. However, if the body is viewed as a creation made for a purpose, then it has an intrinsic value that must be respected to achieve that purpose.

To protect the religious rights of parents and students to a religiously neutral public education, it would seem that public schools must also analyze health, behavioral and social science standards and curriculum for issues

273. *Id.* at 278 (emphasis and bracketed text added).

274. John Calvert, *Religious Rights of Parents and Students in US K-12 Public Education, in Religious Liberty and the Law, in RELIGIOUS LIBERTY AND THE LAW: THEISTIC AND NON-THEISTIC PERSPECTIVES* 145-52 (Angus J. L. Menuge ed., 2018).

275. *Id.* at 150-151.

276. Humanism and Its Aspirations: Humanist Manifesto III, a Successor to the Humanist Manifesto of 1933, AM. HUMANIST ASS'N (2003), <https://americanhumanist.org/what-is-humanism/manifesto3/>; Sincere Kirabo, More than Words: Humanists Should Stand for Secular Social Justice, HUMANIST (Dec. 1, 2015), <https://thehumanist.com/commentary/more-than-words-humanists-should-stand-for-secular-social-justice>.

277. NANCY R. PEARCEY, *LOVE THY BODY: ANSWERING THE HARD QUESTIONS ABOUT LIFE AND SEXUALITY* (2018).

relating to ethics and morality and then write them to ensure that they treat those religious issues objectively and neutrally.

VII. IMPORTANCE OF THE ISSUE – WILL OUR PUBLIC SCHOOLS BE PERMITTED TO ESTABLISH NON-THEISTIC RELIGION IN THE U.S. SO THAT IT BECOMES AN ATHEOCRACY RATHER THAN A SECULAR NATION?

A. *New National Education Standards Seek to Establish a Non-Theistic Religious Worldview in All Students in the United States.*

As explained by Justice Jackson in 1947,²⁷⁸ public schools were founded on the idea that they would be limited to the secular basics of reading, writing, math, English literature, and physical science where religious issues do not arise. In the 1980s and 1990s one might have encountered a two week course in evolution in the tenth or eleventh grade. But this would have occurred after the student had formed his worldview from his parents and community.²⁷⁹ Also, it was presumed that evolution would be taught objectively as it was “science.”²⁸⁰

However, this paradigm began to change dramatically in 2010. Common Core State Standards in Math and English for grades K-12 were released for adoption by states on June 2, 2010.²⁸¹ By November 2013 they had been adopted by “45 states and the District of Columbia,”²⁸² induced in part by

278. *Everson v. Bd. of Educ. of Ewing Twp.*, 330 U.S. 1, 23-24 (1947) (Jackson, J., dissenting) (holding that a state may pay the bus fares of all students, including those who attend parochial schools).

279. Studies and surveys by the Barna Group show that “a person’s worldview is primarily shaped and is firmly in place by the time someone reaches the age of 13; it is refined through experience during the teen and early adult years; and then it is passed on to others during their adult life.” Barna Group, *Barna Survey Examines Changes in Worldview Among Christians over the Past 13 Years*, BARN (March 9, 2009), <https://www.barna.com/research/barna-survey-examines-changes-in-worldview-among-christians-over-the-past-13-years/>.

280. *Segraves v. California*, No. 278978, slip op. at 9 (Sacramento Super. Ct. 1981) (“Court, ‘And, moreover, science is not dogmatic in that it is open ended and there is an absence of preset conclusions?’ The witness, ‘Yes, sir.’ I commend this, to the State Board of Education, as a beautiful and pertinent statement of what science is all about, as a layman.”).

281. *National Governors Association and State Education Chiefs Launch Common State Academic Standards*, NAT’L GOVERNORS ASS’N (June 2, 2010), https://www.nga.org/cms/home/news-room/news-releases/page_2010/col2-content/main-content-list/national-governors-association-a.html.

282. ACHIEVE, *CLOSING THE EXPECTATIONS GAP, 2013 ANNUAL REPORT ON THE ALIGNMENT OF STATE K–12 POLICIES AND PRACTICE WITH THE DEMANDS OF COLLEGE AND CAREERS* 6 (2013), <https://www.achieve.org/files/2013ClosingtheExpectationsGapReport.pdf>.

U.S. Department of Education monetary grants²⁸³ and waivers of non-compliance with the requirements of No Child Left Behind.²⁸⁴ The standards in Math and English do not explicitly address religious issues. However, they provide the foundation for national standards for all students in all other subjects.

Using a theistic rather than an inclusive definition of religion, the *Framework* and *Standards* were offered to states for adoption in 2013 to capitalize on the success of the Common Core. By January 1, 2018, they had been adopted explicitly or implicitly by thirty-two states.²⁸⁵ In 2012 the K-12 National Sexuality Education Standards were published “to promote the institutionalization of comprehensive sexuality education in public schools” that were “informed by. . . the *Common Core State Standards for English Language Arts and Mathematics*.”²⁸⁶ A year later C-3 National Social Studies State Standards were released, and designed to be aligned with the Common Core Standards.²⁸⁷

The *Framework* and *Standards* seek to establish a “scientific worldview” in every student in the Country, beginning at age five and ending thirteen years later at the child’s graduation from High School.²⁸⁸ The worldview includes acceptance of the view that “*all organisms are related by [materialistic] evolution, and that [unguided] evolutionary processes have led to the tremendous diversity of the biosphere.*”²⁸⁹ Because of the Orthodoxy, the

283. *Common Core State Standards Initiative*, WIKIPEDIA (March 27, 2018, 9:17 PM), https://en.wikipedia.org/wiki/Common_Core_State_Standards_Initiative.

284. *Common Core Repeal Costs Oklahoma its NCLB Waiver*, POLITICO, https://www.politico.com/story/2014/08/oklahoma-common-core-no-child-left-behind-waiver-110421_Page2.html#continue.

285. *State Adoptions of Science Standards Since 2013*, COPE, INC., www.copeinc.org/docs/State-Adoptions.pdf.

286. FUTURE OF SEX EDUCATION INITIATIVE, NATIONAL SEXUALITY EDUCATION STANDARDS: CORE CONTENT AND SKILLS, K-12, (2012), <http://www.futureofsexed.org/documents/josh-fose-standards-web.pdf>.

287. NATIONAL COUNCIL FOR THE SOCIAL STUDIES (NCSS), COLLEGE, CAREER, AND CIVIC LIFE (C3) FRAMEWORK FOR SOCIAL STUDIES STATE STANDARDS: GUIDANCE FOR ENHANCING THE RIGOR OF K-12 CIVICS, ECONOMICS, GEOGRAPHY, AND HISTORY, 7 (2013).

288. *Standards*, *supra* note 157 at 3, APPENDIX G - CROSSCUTTING CONCEPTS (“To capture the vision in the *Framework*, students should be assessed on the extent to which they have achieved a coherent scientific worldview”; FRAMEWORK, *supra* note 156, at 41-42, 48; John Calvert, *Religious Rights of Parents and Students in US K-12 Public Education*, in *Religious Liberty and the Law*, in RELIGIOUS LIBERTY AND THE LAW: THEISTIC AND NON-THEISTIC PERSPECTIVES 145-46 (Angus J. L. Menuge ed., 2018).

289. *Framework*, *supra* note 156, at 139 (“Without unifying principles, it would be difficult to make sense of the living world and apply those understandings to solving problems. A core principle of the life sciences is that all organisms are related by [materialistic] evolution and

worldview is materialistic/atheistic. Its indoctrination during the years the child is expected to develop a worldview is incremental, progressive, comprehensive, and deceptive.²⁹⁰ The inheritance of traits is to be introduced in the first grade.²⁹¹ Each year another concept is added. The basics of the worldview can be expected to be established by middle school and refined in high school.

The Framework and Standards are based on psychological studies that recognize that children intuitively develop “misconceptions” about the natural world.²⁹² One “misconception” is that life is designed by a creator. Inexplicably the curricula standards are structured to change the “misconception” by the end of middle school, when the child is thirteen to fourteen.²⁹³ The psychological studies that form a part of the basis for the F&S

that [unguided] evolutionary processes have led to the tremendous diversity of the biosphere.”) (emphasis and bracketed text added). *Id.* at 161 (“Biological evolution explains both the unity and the diversity of species and provides a unifying principle for the history and diversity of life on Earth.”).

290. *Framework, supra* note 156, at 25 (“The implication of these findings for the framework is that building progressively more sophisticated [materialistic/atheistic] explanations of natural phenomena is central throughout grades K-5, as opposed to focusing only on description in the early grades and leaving explanation to the later grades.”) (emphasis and bracketed text added). The progression is deceptive as the Orthodoxy is concealed from the students. *See also* Section V.B.3, *supra*.

291. *Standards, supra* note 157, DCI Arrangements of the Next Generation Science Standards, at 13.

292. *Framework, supra* note 156, at 24-25 (“Children entering kindergarten have surprisingly sophisticated ways of thinking about the world, based in part on their direct experiences with the physical environment, such as . . . observing plants and animals. They also learn about the world through everyday activities, such as talking with their families . . . As children try to understand and influence the world around them, they develop ideas about their role in that world and how it works . . . Although they may lack deep knowledge and extensive experience, they often engage in a wide range of subtle and complex reasoning about the world. Thus, before they even enter school, children have developed their own ideas about the physical, biological, and social worlds and how they work . . . Such initial ideas may be more or less cohesive and sometimes may be incorrect. However, some of children's early intuitions about the world can be used as a foundation to build remarkable understanding, even in the earliest grades. Indeed, both building on and refining prior conceptions (which can include misconceptions) are important in teaching science at any grade level. The implication of these findings for the framework is that building progressively more sophisticated [materialistic/functionally atheistic] explanations of natural phenomena is central throughout grades K-5, as opposed to focusing only on description in the early grades and leaving explanation to the later grades.”) (emphasis and bracketed text added).

293. Paul L. Harris & Melissa A. Koenig, *Trust in Testimony: How Children Learn About Science and Religion*, *Child Development*, 77 *CHILD DEV.* 505 (2006), https://www.researchgate.net/publication/7094106_Trust_in_Testimony_How_Children_Learn_About_Science_and_Religion; *Framework, supra* note 156, at 249; NATIONAL RESEARCH

recognize that it is not an easy task as materialistic evolution is counterintuitive. However, educational psychologists find that impressionable children tend to naturally accept what authority figures tell them is true. Eventually, like their teachers, they will embrace materialistic explanations of the key questions of life - where do we come from and what is the nature of life.²⁹⁴

In addition, the *Framework and Standards* seek to make the “scientific worldview” cohere with all other subjects.²⁹⁵ Accordingly, the concealed materialistic/atheistic Orthodoxy guides the child’s education not only about the child’s origins and nature, but also about how the child should live life consistent with the Orthodoxy. In Health Science students are taught comprehensive sex education where the student learns only non-theistic views about human sexuality, sanctity of life, and family. In the social sciences, the child learns how to be a “good citizen” using a non-theistic perspective.

All of this is being done when the child lacks the knowledge and cognitive maturity necessary to make any reasonably informed decision about what to accept and believe. As children are impressionable and tend to accept as true what they are told by their teachers, one may expect the continued concealed use of the Orthodoxy to eventually establish a non-theistic religion throughout the country.

Most States have provisions that allow a knowledgeable parent to opt a child out of a lesson that is offensive to the religion the parent seeks to instill in the child. However, opt-outs do not cure an Establishment Clause violation as parents and students are entitled to education that is religiously neutral.²⁹⁶

Furthermore, opt-outs from modern origins, health, and social sciences that are incrementally, progressively, comprehensively and deceptively woven into the entire K-12 educational experience are completely ineffective, unworkable and counter-productive for numerous reasons. Parents have no access to what is planned to be taught on a particular day or any given week. Even if they were generally informed they are not likely to have the expertise

COUNCIL, LEARNING SCIENCE IN INFORMAL ENVIRONMENTS: PEOPLE, PLACES AND PURSUITS 113 (Philip Bell et al. eds., 2009) (citing E.M. Evans, *Cognitive and Contextual Factors in the Emergence of Diverse Belief Systems: Creation versus evolution*, 42 COGNITIVE PSYCHOL. 217-266 (2001)).

294. *Id.*

295. *Framework*, *supra* note 156, at 306 (“Basically, a coherent set of science standards will not be sufficient to prepare citizens for the 21st century unless there is also coherence across all subject areas of the K-12 curriculum.”).

296. *Sch. Dist. of Abington Twp. v. Schempp*, 374 U.S. 203, 224-25 (1963).

necessary to recognize that an increment of indoctrination is actually part of a larger thirteen-year agenda. Origins science education is extremely sophisticated and, as explained, deceptive. To effectively opt out of the indoctrination the parent would have to remove the child from all public K-12 education and bear the \$10,000 average per child per year expense of private schooling or the loss of a parent's employment to provide for adequate home schooling.

Thus, as a practical matter, most middle and low income families are likely to have no recourse other than the courts.

B. Polls Show That Use of the Concealed Orthodoxy with an Exclusive Theistic Definition of Religion Is Changing the Religious Demography of the United States from Theistic to Non-Theistic at a Rate of About 1% Per Annum.

The transition from a theistic to a non-theistic culture is reflected in Pew Research reports that show the percentage of U.S. residents holding non-theistic beliefs to have increased from 16% in 2007 to about 23% in 2014 of the total population with the rate of increase at about one percent per year.²⁹⁷ The Standards should accelerate this change as they have been adopted by thirty-four states and the District of Columbia at the rate of about seven adoptions a year since 2013.²⁹⁸ At this rate nearly every state in the nation will have embraced them by 2020. By 2033, one might reasonably expect most children in the country to have received the complete thirteen-year K-12 program of indoctrination in the materialistic/atheistic worldview mandated by the Orthodoxy.

The effect on the school children is revealed by a recent poll by the Barna Group. It shows that around 35% of teenagers age thirteen to eighteen are now Atheistic, Agnostic or Pantheistic.²⁹⁹

297. *America's Changing Religious Landscape*, PEW RESEARCH CENTER (May 12, 2015), www.pewforum.org/files/2015/05/RLS-08-26-full-report.pdf.

298. Citizens for Objective Public Education, *State Adoptions of NGSS: Arkansas, California, Connecticut, Delaware, District of Columbia, Hawaii, Illinois, Iowa, Kansas, Kentucky, Maryland, Michigan, Nevada, New Jersey, Oregon, Rhode Island, South Dakota, Vermont, Washington, West Virginia, and Wyoming*, COPE (May 2016), <http://copeinc.org/docs/StateAdoptions.pdf>.

299. Barna Group, *Atheism Doubles Among Generation Z*, BARN (January 24, 2018), https://www.barna.com/research/atheism-doubles-among-generationz/?utm_source=Barna+Update+List&utm_campaign=fb6ed9e928EMAIL_CAMPAIGN_2017_12_28&utm_medium=email&utm_term=0_8560a0e52e-fb6ed9e928-180643653&m_c_id=fb6ed9e928&m_c_eid=56872fc6e8.

It may come as no surprise that the influence of Christianity in the United States is waning. Rates of church attendance, religious affiliation, belief in God, prayer and Bible-reading have been dropping for decades. Americans' beliefs are becoming more post-Christian and, concurrently, religious identity is changing.

Enter Generation Z: Born between 1999 and 2015, they are the first truly 'post-Christian' generation The percentage of Gen Z that identifies as atheist is *double* that of the U.S. adult population.³⁰⁰

Presumably the reason for the cutoff at age thirteen, is that is the age at which children normally have formed their religious worldview.³⁰¹ Age thirteen is the age of the typical eighth grader. The *Framework and Standards* begin the indoctrination at age five and expect eighth graders to have accepted all the basics of the materialistic narrative. It is then refined in high school. Given that indoctrination one might expect the non-theistic religious percentages in the Barna poll to increase significantly in the next few years.

VIII. CONCLUSION

Under the current paradigm, one may persuasively argue that it is the state, not the parent that is effectively directing the religious education of cognitively immature and impressionable children that lack the knowledge necessary to make an informed decision about the matter. This Article argues that the key to correcting this unconstitutional paradigm is for K-12 public schools to execute the trust established by *Edwards* using a true and constitutional definition of religion in an objective and neutral manner that will protect the religious rights of parents and students.

Using the inclusively legal definition of religion, they must then identify curricula that address religious issues. These include curricula relating to origins, health, behavioral and social sciences. Once an issue is identified, the school must either develop objective and neutral curricula to teach it, or remove the issue from the classroom. If not removed, because it is claimed to be objective and neutral, schools need to inform parents, students and

300. *Id.*

301. Studies and surveys by the Barna Group show that "a person's worldview is primarily shaped and is firmly in place by the time someone reaches the age of 13; it is refined through experience during the teen and early adult years; and then it is passed on to others during their adult life." See Barna Group, *Barna Survey Examines Changes in Worldview Among Christians over the Past 13 Years*, BARN (March 9, 2009), <https://www.barna.com/research/barna-survey-examines-changes-in-worldview-among-christians-over-the-past-13-years/>.

taxpayers as to how the included religious issues will be taught. This may be accomplished by posting implementing curricula on publically accessible websites.

Citizens for Objective Public Education, Inc. is a non-profit organization which has been active in efforts to enforce the Trust. Information and resources may be found at www.copeinc.org.

As Justice Jackson noted, the concept of a truly secular public education may not be “possible or wise.” One alternative to protect the religious rights of parents would be vouchers. States could issue vouchers to parents for endorsement to a private or public school of their choice.³⁰² Thus, parents could select the school, whether public or private, that would provide the religious and best secular education of their choice. As schools would be competing for the vouchers, one might imagine that such a competitive voucher program would actually produce a better education than that now produced by non-competitive unionized public schools.

302. *Zelman v. Simmons-Harris*, 536 U.S. 639 (2002).