

Expert Witness Statement by Eugenie C. Scott

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Respectfully submitted:

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1. Qualifications

My name is Eugenie C. Scott. My curriculum vitae is attached to this Declaration as Exhibit A. I have a Ph.D. in physical anthropology from the University of Missouri and honorary doctorates (D.Sc.) from McGill University, Ohio State University, and Mt. Holyoke College. In December 2006, I will receive an honorary doctorate from the University of Wisconsin-Milwaukee, and in May 2007, from Rutgers University.

I am the Executive Director of the National Center for Science Education (NCSE) in Oakland, California. NCSE is a nonprofit membership organization of scientists and others that defends the teaching of evolution in the public schools. NCSE is affiliated with the American Association for the Advancement of Science. The NCSE monitors the creationism/evolution controversy and maintains an archive of information on the recent history of the controversy, including materials relevant to the history of the creationism/evolution controversy in Cobb County. Before becoming NCSE’s executive director in late 1986, I taught science at the university level at the University of Colorado and at the University of Kentucky. Among other academic work, I published articles about the creationism/evolution controversy in the scholarly literature. I also participated in community

controversies involving the introduction of creationism into the classroom.

Since becoming executive director of NCSE, I have continued to publish scholarly work (available upon request) in journals such as *Science*, *The Quarterly Review of Biology*, *BioScience*, *American Journal of Physical Anthropology*, *Cell*, *Nature*, and elsewhere. I am the author of a book on the creationism/evolution controversy, *Evolution vs. Creationism: An Introduction*, which was published in 2005 by the University of California Press, and named an *Outstanding Academic Title* of 2005 by *Choice*. I am co-editor of a book with Glenn Branch, Deputy Director of NCSE, entitled *Not In Our Classroom: Why Intelligent Design Is Wrong For Our Schools*, published in 2006 by Beacon Press. The articles in the book discuss the “intelligent design” (ID) form of creationism from historical, scientific, legal, theological, and pedagogical perspectives. Articles of mine have been reprinted in collections of scientific readings and anthologies on the creationism/evolution controversy.

I am recognized by scientists and other scholars as an expert on the subject of the creationism/evolution controversy and have received recognition for my work in this area from several scientific and educational organizations and institutions, including receiving the aforementioned honorary degrees. I have also received recognition for my work on the creation/evolution controversy from, among others, the following scholarly organizations: the National Science Board (Public Service Award), the American Society for Cell Biology (Bruce Alberts Award), the American Institute of Biological Sciences (Outstanding Service Award), and the Geological Society of America (Public Service Award). I was selected Outstanding Alumna of the Arts and Sciences College of the University of Missouri. I also received the Distinguished Service Award from the California Science Teachers Association, and the highest honor of the National Association of Biology Teachers, Honorary Member. The American Association for the Advancement of Science made me a Fellow in 2003.

I have consulted for and/or appeared in several PBS documentaries that have dealt with the creationism/evolution controversy, including *In the Beginning* and NOVA’s *Evolution* series, and have consulted on other videos produced by others. In addition, I have consulted with museums on the presentation of evolution in exhibits, and conducted workshops for interpreters at museums and other informal science institutions (such as zoos, national parks). I am featured in video clips in the American Museum of Natural History exhibit on Darwin, now on tour, talking about science and religion, and the creationism/evolution controversy.

I am frequently called upon by the media to provide expert commentary on the creationism/evolution controversy. Among other things, I have appeared on several national television and radio programs, including network and cable news programs. More generally, members of the press regularly cite and consult NCSE as the most important source for information on the creationism/evolution controversy.

I have acted as a consulting expert in *Kitzmiller v. Dover Area School Board*,¹ *Peloza v. Capistrano*

¹ *Kitzmiller v. Dover Independent School District* 400FSupp.2nd: 707.

Unified School District,² *Rodney LeVake v. Independent School District 656, et al.*,³ and a legal case in Australia, all of which dealt with issues surrounding the teaching of creationism and evolution. I was an expert witness for *Hurst v. Newman*⁴, which also involved the teaching of creationism and evolution. I have been asked to testify as an expert on the creationism/evolution controversy and on the teaching of creationism and evolution in public schools.

I believe that I am well-qualified to provide expert testimony on the nature of science; how the scientific definitions of “theory” and “fact” differ from those used among the general public; the history of the creationism/evolution controversy, including the various forms of creationism and the history of antievolution policies (such as “evidence against evolution” and “theory not fact” policies) and their relationship to creationism; the history of the creationism/evolution controversy in Georgia and Cobb County; why “theory not fact” language is inappropriate educational pedagogy; and other topics relating to the teaching of both evolution and creationism.

2. The Nature of Science

My understanding of the nature of the scientific enterprise is the result of approximately 15 years teaching science at the university level, and even more years of presenting science to teachers, and the general public. My knowledge comes from reading and study. There is also a substantial chapter on the nature of science in my book *Evolution vs. Creationism: An Introduction*.

Science can be defined broadly or narrowly, but at the most basic level science is a way of knowing that involves the testing of explanations against the natural world. Testability is thus a fundamental criterion of science. Unlike logic, for example, in which propositions are determined to be true based on their structure, explanations derived through science are repeatedly tested against empirical data. Science’s reliance on empirical data also distinguishes it from explanations deriving from proclamations of an authority (natural or supernatural), as well as information obtained from meditation or other personal states of being.

A second fundamental criterion is that science necessarily is restricted to natural causes. A scientific test requires the ability to predict an outcome that is consistent with the explanation being proposed. Part of the testability of a scientific explanation is, therefore, that some variables are held constant (“controlled”) in order to test claims of causation. If one resorts to supernatural causation, as in “God did it,” it is impossible to test such a claim because one cannot hold constant the actions of a supreme being. When supernatural forces are invoked, *any* outcome of a test is compatible with the actions of an omnipotent being. Hence claims of supernatural causation are by definition outside the realm of what science can test or predict, and science is limited to explaining through natural causes.

3. The Scientific Meaning of “Theory” and “Fact”

My understanding of the meaning of the terms “theory” and “fact” in their scientific context comes

² The Ninth Circuit’s decision in *Pelozo* is available at 37 F.3d 517.

³ *Rodney LeVake vs. Independent School District #656*, State of Minnesota Court of Appeals, C8-00-1613 (May 8, 2001).

⁴ *Hurst v Newman*, case no. 1:06CV-00036, US District Ct for the Eastern District of Calif.

from my understanding of philosophy of science, from having been a practicing scientist myself, and from having taught science to students and the public for decades. It also comes from my work at NCSE, in which I deal regularly with this issue in the context of the creationism/evolution controversy.

Scientists confirm that terms like “theory”, “fact”, and “law” differ in their colloquial and scientific definitions.⁵ A “law” to members of the public is an unchangeable state of affairs that, like laws established by elected bodies, cannot be “broken.” In science, a law is a descriptive generalization, and laws may indeed change (be “broken”) with new data or instrumentation allowing new insights. Mendel’s Law of Independent Assortment, for example, does not hold when genes are too close to one another on the chromosome – an insight unavailable until the discovery of molecular genetics. Similarly, the public views “facts” as unchanging, or carved in stone; in science, a fact is a confirmed observation – which may change with better technology or new data. It was once a confirmed observation (a “fact”) that humans had 48 chromosomes until better instrumentation allowed the more accurate observation that we have 46. But the scientific term with the greatest difference in usage between the public and scientists is the term “theory,” which means “guess” or “hunch” to members of the public, and something far more important to scientists. In science, a theory is a logical construct of facts, laws, and tested hypotheses that *explain* a natural phenomenon. The proper synonym for theory – used in the scientific sense – therefore is “explanation,” rather than “guess.” Because evolution is a well-established scientific theory – in the sense of an explanation – it is no more a guess than the theory of gravitation or the theory of the atom.

4. The History of The Creationism/Evolution Controversy

I base my opinions on the early history of the creationism/evolution controversy on my study of works by well-known scholars in this field such as Ronald Numbers, James Moore, and Edward Larson. The NCSE library and archives also contain primary sources from the creationist literature, which I have availed myself of. My knowledge of the more recent history of the creationism/evolution controversy comes from these archives, as well as my personal collection of creationist materials, dating from approximately 1971. In part, my opinions on the recent history of the creationism/evolution controversy date from my involvement beginning in 1980-81 as a citizen in Lexington, KY, concerned about science education in my community. In the anthropological sense, I have been a “participant observer” of the last 20 years of the creationism controversy, interacting with partisans on both sides.

Definitions of Evolution, Creationism, and Creation Science

“Evolution,” broadly defined, is “a cumulative change through time.” It refers to the fact that the universe has had a history — if we were able to go back in time, we would find different stars, galaxies, and planets, and different forms of life on Earth. Because stars, galaxies, planets, and living

⁵ National Academy of Sciences (U.S.). 1998. *Teaching About Evolution and the Nature of Science*. Washington, DC: National Academy Press. See also: National Academy of Sciences (U.S.). 1999. *Science and Creationism : A View From the National Academy of Sciences*. 2nd ed. Washington, DC: National Academy Press.

things have all changed through time, there is astronomical evolution, geological evolution, and biological evolution, and the concept of evolution is integral to the scientific disciplines of astronomy, geology, and biology. It is also relevant to physics and chemistry. Evolution is therefore a major component of modern science. But evolution needs to be defined more narrowly within each of the scientific disciplines because both the phenomena studied and the processes and mechanisms of cosmological, geological, and biological evolution are different.

Astronomical evolution deals with cosmology: the origin of elements, stars, galaxies, and planets. Geological evolution is concerned with the evolution of our own planet: its origin and its cumulative changes through time. Mechanisms of astronomical and geological evolution involve processes studied by physics and chemistry, including thermodynamics, heat, cold, expansion, contraction, erosion, sedimentation, and the like. In biology, evolution is the inference that living things share common ancestors and have, in Darwin's words, "descended with modification" from these ancestors. The main — but not the only — mechanism of biological evolution is natural selection.

The term "creationism" connotes the theological doctrine of special creationism: that God created the universe essentially as we see it today, and that the universe has not changed appreciably since that creation event. Special creationism includes the idea that God created living things in their present forms, and is reflected in a literalist view of the Bible wherein God created animals and plants as independent "kinds." Within the "kinds" — which are not consistently defined — evolution can take place: this is what special creationists mean by "microevolution." So for example, within the specially created "cat kind," there can be evolution of lions, tigers, pumas, housecats, bobcats, and so on. But there can never be common ancestry of two "kinds." Evolution is rejected between, if not within, kinds.

The concept of special creationism is often associated with an endeavor called "creation science." Creation science includes the view that the universe and the Earth are only (roughly) 10,000 years old, so it is sometimes called "young-Earth creationism." Creation science is largely the descendent of ideas first presented in the 1960s by a hydraulic engineer, Henry M. Morris, who sought to use science to prove the literal truth of Bible stories. The organization that Morris founded, the Institute for Creation Research, continues to promulgate his views to the present day.

Another type of special creationism, however, is "progressive creationism," in which God creates things in their present form, but serially — at different points over a long period of time and not over a six-day period. Progressive creationism would posit, for example, that God first created DNA, then later created a single cell, then later still created simple metazoa, the invertebrate body plans of the Cambrian, and so on. Progressive creationism does not assume that the Earth is only 10,000 years old, but instead accepts the scientific evidence that the Earth is billions of years old. Holding that God engaged in multiple acts of special creation throughout the Earth's history, progressive creationists also reject common ancestry of created "kinds," though there can be microevolution within a kind — although they, like young-Earth creationists, are not specific as to what a "kind" is. Intelligent design is a form of creationism. Its proponents tend to avoid discussion of issues such as the age of the Earth, and focus instead on the core issue of special creation. Intelligent-design proponents believe that God (or, as they put it, "an intelligent agent" with powers greater than any known material agent) specially creates "irreducibly complex" biological structures or processes. The claim is that such complex structures and processes are unexplainable through natural cause,

and therefore, by default, God must have created them specially. The majority of the intelligent-design creationist leadership are progressive creationists, though some are young-earth creationists. Some claim to accept evolution, but what they inevitably are referring to is evolution within the “kind,” which is a common creationist position.

To many Christians, Jews, and others, the idea that God created includes the idea of evolution. Mainstream Christian theology, for example, includes several varieties of “theistic evolution” — the view that evolution occurred, but that it was part of God’s plan.⁶ Theistic evolution is presented in, for example, Catholic high schools, and is expressed in statements on creationism and evolution from officials representing the Episcopalian Church, the Presbyterian Church (USA), the United Church of Christ, and other denominations.⁷ Some forms of theistic evolution involve different degrees of God’s intervention, but none are special creationist, for none hold that God creates things in their present forms. Theistic evolution is specifically rejected by intelligent design creationists; as leading intelligent design proponent William Dembski has said, “Design theorists are no friends of theistic evolution.”⁸ This is because theistic evolutionists accept common ancestry, but the intelligent design proponents do not.

Fundamentalism; Banning Evolution

Religiously motivated hostility toward the teaching of evolution has its roots in the religious tradition of Christian Fundamentalism, which itself arose in the early 20th Century in part as a cultural response to Charles Darwin’s exposition of evolutionary theory as the scientific explanation for the diversity of species.

Initially, antievolutionists, who for religious reasons objected to the scientific theory of evolution, attempted to ban the teaching of that theory altogether. Most famously, there was a Tennessee statute prohibiting the teaching of evolution, which John Scopes was convicted of violating a 1925. Following his conviction, many other states and local school boards adopted laws or policies similar to Tennessee’s, with the result that evolution disappeared from the curricula of public schools throughout the country.

In 1968, however, the Supreme Court ruled in *Epperson v. Arkansas*⁹ that such prohibitions against teaching evolution violated the Establishment Clause of the First Amendment. Shortly thereafter creationists encouraged legislators to submit what came to be called “Genesis bills”¹⁰ which argued for “balancing” the teaching of evolution with the teaching of biblical creationism. Such bills were

⁶ Peters, T. and M. J. Hewlett (2003). *Evolution from Creation to New Creation : Conflict, Conversation, and Convergence*. Nashville, TN, Abingdon Press.

⁷ Matsumura, M., 1995. *Voices for Evolution*, second ed. Berkeley CA, National Center for Science Education.

⁸ Dembski, William A. 1995. “What Every Theologian Should Know About Creation, Evolution, and Design.” *Center for Interdisciplinary Studies Transactions* 3(2):1-8 (p. 3).

⁹ 393 U.S. 97 (1968).

¹⁰ Saladin, Kenneth S., (1986). Educational Approaches to Creationist Policies in Georgia. in Robert W. Hanson, ed, *Science and Creation; Geological, Theological, and Educational Perspectives*. NY: Macmillan Publishing Co., pp. 104-127.

introduced in Georgia, Tennessee, Kentucky, Michigan, Arizona and Washington, although only the Tennessee bill passed. In *Daniel v. Waters*,¹¹ the Appeals Court for the Sixth Circuit ruled that this bill was unconstitutional. This largely ended the effort to encourage equal time for biblical creationism and evolution.¹²

Creation Science

Because of *Epperson* and *Daniel*, evolution could not be banned, nor could biblical creationism be taught with it to “balance” its purported negative effects. Creationists reasoned that even if teaching the Bible in public schools was unconstitutional, teaching an “alternate scientific view” might not be. “Creation science” – a young-Earth movement claiming that a Genesis-based creation story could be supported through scientific data – emerged in the 1970s as this “alternative.” During the late 1970s and early 1980s, at least 23 states passed “equal time” bills requiring the teaching of creation science if evolution were taught.¹³ Arkansas was the first state to pass such a law, and the Rev. Bill McLean, a Presbyterian minister, was lead plaintiff in a suit to overturn the legislation. In 1982, after a full trial, the district court in *McLean v. Arkansas Board of Education*¹⁴ found that creation science was a religious concept, not a scientific one, and therefore held that teaching it in the public schools was unconstitutional. The argument that creationism was a scientific alternative to evolution was so thoroughly routed in *McLean* that the defense (the state) declined to appeal. However, the loss did not discourage creationists from trying the “equal time” strategy again: at about the time that the district court was invalidating the Arkansas law, the nearby state of Louisiana passed a virtually identical equal-time law. It, too, was taken to court – in fact, by multiple parties – which delayed the law’s day in court. Finally, after the passage of several years, the district court invalidated the law on summary judgement. However, unlike *McLean*, the Louisiana law was appealed to the Appeals Court, which agreed with the lower court, and finally to the Supreme Court.

In 1987, the Supreme Court concluded in *Edwards v. Aguillard*¹⁵ that Louisiana’s balanced-treatment law violated the Establishment Clause because it required Louisiana’s public schools to teach a religious concept. Although there were sporadic attempts to pass equal time legislation after *Edwards*, they dwindled rapidly and were scarce by the 1990s.

The *Edwards* decision ushered in the third, current era of the antievolution movement, in which the more sophisticated antievolutionists are trying to find new ways to undermine the teaching of evolution that will survive constitutional scrutiny. When banning evolution failed, and “balancing” evolution by teaching creation science failed, creationists sought to re-label creation science, the first (alleged) “scientific alternative to evolution,” as “intelligent design,” and proposed its teaching in science class. Simultaneously, creationists encouraged denigrating evolution in a variety of ways, such as calling for teaching the “evidence against evolution,” or teaching “strengths and weaknesses

¹¹ 515 F.2d 484 (1975).

¹² Larson, E. J. (2003). *Trial and Error: The American Controversy over Creation and Evolution*, 3rd ed. New York, Oxford University Press.

¹³ References in Scott, E. (2005). *Evolution vs. Creationism: An Introduction*. Berkeley: University of California Press.

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

¹⁵ 482 U.S. 578 (1987).

of evolution,” or “critical analysis of evolution,” or – in the parlance of the intelligent design creationists – “teach the controversy.” I will discuss the “evolution” of creation science into intelligent design creationism, but first I will present the relationship between the “evidence against evolution” approach and creation science.

“Evidence Against Evolution” and Creation Science

The attempt to re-cast creationism as “evidence against evolution” (also frequently called the “teach the controversy” approach) primarily is an attempt to reduce the appearance of religious content in creationist views so that they will appear more legally and constitutionally palatable. But all forms of creationism are inherently religious, and so is the “evidence against evolution” approach.

This approach was widely applied during the period between the *Epperson* and *Edwards* decisions, when antievolutionists pressed for “equal time” for creation science. Supporters of creation science conceive of the creationism/evolution controversy as a dichotomy, with a literal special creationist reading of the creation story in the Book of Genesis as one alternative and “Godless evolution” as the other. The idea is that, with only two choices (evolution and special creation), evidence against one would logically constitute evidence supporting the other. It is therefore not necessary to “prove” (or even support) creationism, merely to disprove evolution. With evolution out of the way, students would accept the conclusion that God specially created.

In the creationist biology textbook *Biology: A Search For Order In Complexity*, the authors are clear about this dichotomy:

There are essentially only two philosophic viewpoints of origins among modern biologists – the doctrine of evolution and the doctrine of special creation. Proponents of the former postulate the gradual appearance of the various forms of life and of life itself by natural processes over vast ages of time. Exponents of the latter assume the essentially instantaneous origin of life and of the major kinds of living organisms by special creative acts utilized directly by the Creator Himself. ... These two models cannot really be harmonized, except at a very superficial level, since they represent diametrically opposite viewpoints of origins.¹⁶

The intelligent design creationist textbook *Of Pandas and People* likewise presents a dichotomous view, this time between evolution and intelligent design, rather than the more familiar evolution and creation science. “From these six areas of biology, we will present interpretations of the data proposed by those who hold *the* two alternative concepts; those with an evolutionary frame of reference, as well as those who adhere to some kind of intelligent design”¹⁷ (emphasis added).

So creation science and intelligent design proponents scoured (and continue to scour) the scientific literature, seeking anomalies that they can proclaim “prove” that evolution did not happen, arguing that therefore the account of special creation must be true. The “evidence against evolution”

¹⁶ Moore, John N., Harold S. Slusher. 1970. *Biology: A Search for Order in Complexity*. 1st ed. Grand Rapids, MI: Zondervan Corporation. p. xvii; p. xviii.

¹⁷ Davis, Percival W, and Kenyon, Dean H. 1993. *Of Pandas and People*. Second ed. Dallas, TX: Houghton, p. viii.

approach has been around for decades: Arguments concerning gaps in the fossil record, the Cambrian explosion, the second law of thermodynamics, the inadequacy of mutation and natural selection to produce major body plans, and so on, are mainstays of the creation-science literature, and most have been incorporated into the intelligent design literature, despite having been thoroughly debunked time and time again. Arguably, the content of creation science and its descendent intelligent design consists almost entirely of “evidence against evolution.”

The “evidence against evolution equals evidence for creationism” argument has a flawed premise: Evolution and a literal reading of the Book of Genesis are not the only two possible explanations for biological origins. On the contrary, there are many different versions of creationism, and there are many religious views that acknowledge evolution. Thus, even if there were evidence against evolution, as creationists assert and as the scientific community overwhelmingly denies, it still would not constitute affirmative evidence for creation science, even though that is how creationists misleadingly present it. In my experience, however, many members of the public are persuaded by the poor logic of the contrived dualism, believing that evolution and special creationism are the only two alternatives; this shows a lack of religious as well as scientific literacy.

Although there are many different religious views, there is only one actual scientific explanation for biological origins and the diversity of species: evolution as understood by scientists, including both the scientific inference that living things share common ancestors and scientific understanding of the mechanisms that produce evolution’s branching tree of life. Lacking any positive evidence to support the sudden appearance of the universe in six twenty-four-hour days less than ten thousand years ago, creation science’s proponents must cling to the position that finding “evidence against evolution” will suffice as scientific support for special creationism, *i.e.*, the belief that God separately created each individual kind.

The lawsuit *McLean v. Arkansas* dealt directly with this argument. The issue of creation science as science, and the logic of the “evidence against evolution” strategy, were directly addressed by Judge Overton in deciding for the plaintiffs:

The two-model approach of the creationists is simply a contrived dualism which has no scientific factual basis or legitimate educational purpose. It assumes only two explanations for the origins of life and existence of man, plants and animals: it was either the work of a creator or it was not. Application of these two models, according to creationists, and the defendants, dictates that all scientific evidence which fails to support the theory of evolution is necessarily scientific evidence in support of creationism and is, therefore, creation science “evidence” in support of Section 4(a) [of the Arkansas “Balanced Treatment for Creation-Science and Evolution-Science Act”].¹⁸

After the Supreme Court in *Edwards* put an end to “balancing” evolution with creation science, the attention of creationists shifted to the idea of teaching “the evidence against evolution” without overtly pointing to creationism as the alternative, since the religious motivation would then be less obvious. In content, however, little change was required, as creation science predominantly consists of “evidence against evolution” anyway. Thus, for example, immediately after the decision in

¹⁸ *McLean v. Arkansas* (1982) 529 F. Supp. 1255.

Edwards made promotion of equal-time laws an unviable strategy, the Institute for Creation Research (then the nation's largest creation-science organization) proposed an "evidence against evolution" strategy:

[S]chool boards and teachers should be strongly encouraged at least to stress the scientific evidences and arguments against evolution in their classes (not just arguments against some proposed evolutionary mechanism, but against evolution per se), even if they don't wish to recognize these as evidences and arguments for creation (not necessarily as arguments for a particular date of creation, but for creation per se).¹⁹

The ICR clearly regards "the evidences and arguments against evolution" as code for "the arguments for creationism." Also, as lawyer Jay Topkis explained during oral argument in the *Edwards* case, the term "evidences" (plural) as used by the ICR derives from Christian apologetics, and is not used in a scientific context, where the term "evidence" (singular) is used. "Evidence(s) against evolution" thus on many levels is equivalent to "arguments for creationism."

Evolution of Creation Science Into Intelligent Design

Because the Supreme Court and lower federal courts declared the teaching of creationism (and creation science) in the public schools to be unconstitutional religious advocacy,²⁰ many modern creationists, such as proponents of intelligent design, avoid the term "creationism" and other obvious religious identifications. For example, the president of the ICR has disapprovingly explained in a mailing to ICR supporters that "[t]he trend among many Christian groups these days is to camouflage their creationism as 'Intelligent Design' or 'Progressive Creationism.'"²¹

Although intelligent design creationism arguably began with the 1984 publication of a book criticizing origin-of-life research,²² it started to become a more serious focus of antievolutionists' attention immediately after the *Edwards* decision was issued. At that time, Dean Kenyon, who had supplied an expert affidavit in *Edwards* claiming that creation science was the only alternative to

¹⁹ Institute for Creation Research, "The Supreme Court decision and its meaning," *Impact* August 1987; 170; available on-line at <http://www.icr.org/pubs/imp/imp-170.htm>. Emphasis in original.

²⁰ *Edwards v. Aguillard*, 482 U.S. 578 (1987); *Peloza v. Capistrano Unified Sch. Dist.*, 37 F.3d 517 (1994); ; *Webster v. New Lenox School District #122*, 917 F.2d 1004 (____); *Freiler v. Tangipahoa Bd. of Educ.*, No. 94-3577 (E.D. La. Aug. 8, 1997), *aff'd*, _____; *McLean*, 529 F. Supp. 1255.

²¹ John Morris, open letter included with April 1999 mailing of ICR newsletter, *Acts and Facts*.

²² Charles B. Thaxton, Walter L. Bradley, and Roger B. Olsen, *The Mystery of Life's Origin*, New York: Philosophical Library, 1984. The book was shopped to 176 secular publishers before Philosophical Library accepted it; "We were determined the book would not be published by a Christian publisher, and therefore be ignored," Buell recalls. "It was the first book favorable to creation by a reputable secular publisher in over five decades" (Larry Witham, *Where Darwin Meets the Bible*, New York: Oxford University Press, 2002:220).

the scientific theory of evolution, took the creationist textbook he and his colleagues were then preparing and substituted terms like “intelligent design” and “design proponent” for terms like “creation” and “creationist.” (That book, which was published in 1989 under the title *Of Pandas and People*, was at the center of the recent legal controversy over intelligent design in *Kitzmiller v. Dover*.)

The intelligent-design movement developed and gained importance among religiously motivated opponents of evolution in the early to mid-1990s; and since the late 1990s, its supporters have actively lobbied to have it taught in public schools. Proponents of intelligent design contend that intelligent design is a scientific endeavor to detect “design” in nature, with no necessary connections to religion. It is obvious, however, that design implies a designer. If this designer is supernatural, then intelligent design’s proponents and supporters are clearly promoting a religious ideology. Intelligent design’s proponents therefore claim to be agnostic as to the identity of the “designer.” The designer, they say, could be supernatural or it could be material. A recent news article regarding a creationism/evolution dispute in Roseville, California, cited the public information officer for the intelligent-design think tank the Discovery Institute as actually offering three choices: God, extraterrestrials, or a time-traveler from the future. The Discovery Institute’s representative “said most people affiliated with the institute believe that the designer is God. ‘But a person could logically argue that some sort of human has been able to design features of life working through time travel,’ he said. ‘And some people say aliens are the designer.’”²³ Of course, it is doubtful that any of them truly believe that space aliens created life on earth, but this subterfuge is necessary in order to create the appearance that they have avoided Establishment Clause proscriptions against promoting a religious view in the public schools.

Although the intelligent-design movement proclaims itself to be a scientific alternative to evolution, it is actually an effort to promote a narrow sectarian religious ideology. Intelligent design creationism reduces to an assumption at odds with modern science: that there are some biological phenomena that by their nature are unexplainable through natural causes. Intelligent design assumes not just that there are some biological phenomena that are yet *unexplained* by science, but that there are phenomena that are forever outside of the possibility of explanation through science. Intelligent design assumes that such phenomena must be attributed to the direct action of an “intelligence,” and intelligent-design proponents believe that this agent is God. In other words, intelligent design is a circuitous path to saying “God did it.”

Although many scientists believe in God, all scientists regardless of personal religious or nonreligious views restrict themselves to natural causes *when doing science*. The reasons are simple. First, restricting science to explaining natural phenomena in terms of natural causes has yielded spectacular results, and we see no need to change. More importantly, natural causes are the only ones that we can test. Because it is impossible for scientists to test (*i.e.*, hold constant) the acts of a supernatural agent, we have no choice but to limit ourselves to testable natural causes for purposes of doing science. In other words, as scientists we must reject intelligent design’s proposition that some phenomena cannot be explained except through supernatural causes, and must instead seek natural explanations. The as-yet unexplained is not therefore *unexplainable*, and we do not treat it as such.

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Laurel Rosen, “Darwin Faces a New Rival,” *Sacramento Bee*, June 22, 2003.

Put differently, if scientists were permitted, in their capacity as scientists, to consider supernatural causes, those causes could never be ruled out by scientific experimentation. It would never be possible to disprove that a supernatural force (*i.e.*, God) was responsible for whatever natural phenomenon one was observing. So as a scientist one would never be able to draw conclusions about the natural causes for that phenomenon. To take natural phenomena off the table of natural explanation by regarding them as unexplainable or as potentially attributable to a supernatural force would thus be a “science stopper.”

The methodological limitation that restricts science to natural causes does not mean that there cannot in reality be supernatural causes, nor does it say anything about whether a supernatural agent (*e.g.*, God) does or does not exist. It simply means that, as scientists conducting scientific inquiry, we exclude the supernatural and work to develop the best natural explanations that our observations and data permit. To do otherwise would be to cease engaging in science.

The restriction of science to natural cause is sometimes referred to as “naturalism.” That term generates confusion, however, because there is also a philosophical view called “naturalism,” according to which the supernatural does not exist and reality consists only of material (matter and energy) causes. The philosophical view is a claim that is logically independent of science because science cannot say whether supernatural causes do or do not exist. In the attempt to avoid confusion, philosophers of science often refer to the restriction of science to natural causes as “methodological naturalism,” and the philosophical view as “philosophical (or metaphysical) naturalism.”²⁴

Creationists commonly confuse these two uses of the term “naturalism” because they view evolution as being an antireligious philosophical view.²⁵ They oppose evolution because they believe that acceptance of evolution requires abandonment of faith — a belief that is refuted by the fact that many scientists are also people of faith.²⁶ The district court in the *Kitzmiller* case considered

²⁴ Pennock, Robert 2003. Creationism and Intelligent Design, *Annual. Rev. Genomics Hum. Genet.* 2003. 4:143–63.

²⁵ Religious conservatives are not the only ones who confuse philosophical with methodological naturalism and thus misunderstand the nature of science. Some scientists have written that evolution and faith are incompatible, and creationists love to cite them to support the creationist view. But philosophical materialists (such as Richard Dawkins and William Provine) who claim the authority of science for their philosophical views do not speak for the scientific community. Their claims about science have been strongly criticized even by fellow materialists. Scott, Eugenie C. 2004. *Evolution vs Creationism: An Introduction*. Berkeley, CA: University of California Press and references therein.

²⁶ Much of the objection to evolution found among conservative Christians stems from the belief that acceptance of evolution entails the abandonment of faith. That belief depends on a misunderstanding of the nature of science. Science is a limited way of knowing that attempts to explain the natural world based on natural causes, but it does not claim that science is the only possible way of understanding the world. There are evangelical Christians, such as Francis Collins, who accept evolution; they are frequent contributors to the website and annual meetings of an esteemed organization of evangelical Christians called the American Scientific Affiliation (www.asa3.org).

testimony from some of intelligent design's chief proponents, as well as experts in evolutionary science and science education. The court correctly found that, whereas evolution is a scientific theory that respects these necessary methodological limitations, intelligent design is a non-scientific religious view that assumes there are unexplainable supernatural causes.

Not only is intelligent design's methodology unscientific, but its specific claims have been examined and rejected by scientists.²⁷ Moreover, there are no known articles in the peer-reviewed scientific literature where the principle of intelligent design is being used in the biological sciences to help gain a better understanding of the natural world.

Intelligent design is also recognized by its proponents and the public as a religious view: God directly designs (and creates) certain natural phenomena that are allegedly incapable of being produced through natural causes. Moreover, it is clear both from what intelligent design's proponents do and from what they say that the intelligent design movement is motivated by a religious purpose.

A major spokesperson for intelligent design, philosopher and mathematician William Dembski, has written, "Intelligent design is three things: a scientific research program that investigates the effects of intelligent causes; an intellectual movement that challenges Darwinism and its naturalistic legacy; and a way of understanding divine action."²⁸ Two of Dembski's three identifying qualities of intelligent design are thus expressly religious in nature: combating naturalism (which Dembski and other ID proponents understand to involve atheism), and understanding divine action. As for the third, intelligent design has not made any contributions to the scientific research literature at all, contrary to Dembski's claim that intelligent design is a "scientific research program."

Although many of its proponents purport to disavow any religious motivations, the religious purpose of intelligent design is found in much of the published and on-line intelligent-design literature. The Discovery Institute houses the central think tank of the intelligent-design movement, the Center for Renewal of Science and Culture (now the Center for Science and Culture). The president of the Discovery Institute, in announcing the founding of the CRSC in 1996, stated that the CRSC's goals included: "To defeat scientific materialism and its destructive moral, cultural and political legacies. To replace materialistic explanations with the theistic understanding that nature and human beings are created by God."²⁹ A few years later, he again underscored the essentially religious purpose of the CRSC, writing, "our Center for the Renewal of Science and Culture seeks to show that science supports the concept of design and meaning in the universe — and that that design points to a knowable moral order."³⁰

²⁷Young, M. and Taner Edis (2004). *Why Intelligent Design Fails: A Scientific Critique of the New Creationism*. New Brunswick, Rutgers University Press.

²⁸ William A. Dembski, *Intelligent Design: The Bridge between Science and Theology* (Downers Grove, IL: InterVarsity Press, 1999).

²⁹ Bruce Chapman, Discovery Institute web page, October 1999. This page is no longer available on the website.

³⁰ Bruce Chapman, "Letter from the President," *Discovery Institute Journal* (Spring 1998), p. 3.

Science does not deal with “theistic understanding[s]” or attempt to make claims about God. Nor is the task of science to “defeat * * * moral, cultural and political legacies.” Those objectives are the province of religion, theology, and perhaps ethics. To the extent that it may be useful to the Court, I am prepared to provide many more examples of the religious purpose underlying intelligent design. Those examples come from Discovery Institute literature, the writings of Discovery Institute fellows and other nationally-known supporters of intelligent design (such as Phillip Johnson, William Dembski, Michael Behe, and Stephen Meyer), and the comments of citizens interested in promoting intelligent design at the local level.³¹

In sum, intelligent design, like creation science, principally involves presenting “evidence against evolution,” positing that there are only two explanations for the origins of biological entities — evolution in accordance with natural processes on the one hand, and “design” (*i.e.*, creation) by a supernatural entity on the other. Like creation science, it posits that any evidence tending to cast doubt on evolution must perforce be evidence in favor of the creationist alternative. And like creation science, it is a religious view, not a scientific theory; neither are testable, and neither are restricted to natural causes.

When creation scientists and intelligent-design proponents are defeated in their attempts to have creationism incorporated into a public school curriculum, they generally adopt a “fall-back” position of seeking to have the teaching of evolution “balanced” against the presentation of supposed

³¹ With respect to such local advocacy, a few examples here will suffice to make the point that intelligent design’s proponents recognize the view to be a religious one. A citizen in Cobb County, Georgia, wrote in a letter to the editor:

The complexities of the human body and the incredible way the earth supports the life upon it are just two examples that make it difficult to believe we simply erupted from nothing. These complexities require an intelligent designer, and that intelligent designer is God.

Kip Howard, letter to the editor, *Atlanta Journal Constitution*, August 22, 2002. An intelligent-design supporter in Ohio explained the identity of the “intelligent designer” this way:

“It’s God, sure,” he answers when pressed for his own belief. “But everyone doesn’t have to say that. I suppose it goes back to the status of the legal situation, that if they can pin down [who ID proponents think the designer is], it might affect whether the courts view ID as an attempt to endorse a religious belief.”

John Mangels and Scott Stephens, “Ohio’s Intelligent Design Crusader,” *Cleveland Plain Dealer*, June 13, 2002. And as Judge Jones explained in the *Kitzmiller* decision, “numerous letters to the editor and editorials” published in the local newspapers in the Dover, Pennsylvania, area “reveal that the entire community has consistently and unwaveringly understood the controversy [over including intelligent design in the high-school biology curriculum] to concern whether a religious view should be taught as science,” and therefore that “the community and hence the objective observer who personifies it, cannot help but see that the ID policy implicates and thus endorses religion.” 2005 WL 3455563, at *22-*23.

evidence against evolution. But because “evidence against evolution” is the core concept in both creation science and intelligent design, the key difference between teaching creation science or intelligent design and the fall-back position turns out to be simply that the fall-back position avoids expressly using the labels “creation science” or “intelligent design.” In other words, it takes one additional step to attempt to obscure the religious underpinnings of the concept, while still seeking the same religious objective of disparaging evolution for the sake of promoting a religious alternative. And because students are highly likely to share the “contrived dualism” dichotomous view (on which evidence against evolution is evidence for creationism), disparaging evolution is likely to promote the default view that God created – without overtly mentioning God.

The denigration of evolution therefore has had a long history in the creationism/evolution controversy. Creationists do not wish their children to be taught evolution; they believe that learning evolution may lead to accepting evolution, which means (according to their theology) that children will lose their faith in God, be lost to salvation, and have no moral rudder to keep them from being immoral people. Not for nothing was the first effort of creationists to attempt to ban the teaching of evolution. On the other hand, if evolution is not considered to be valid science, there is no reason to teach it, and students will not be exposed to it. Teaching the “evidence against evolution” or the “flaws in evolution” leads students to believe that evolution is not valid and can be ignored.

Similarly, teaching students that evolution is “only a theory” rather than a “fact” (reflecting the nonscientific definitions of these terms) has the same effect: evolution is presented as a weak or unsubstantiated view that needn’t be accepted or taken seriously. Efforts to denigrate evolution in this fashion have been part of the antievolution campaign since the 1920s. Because of the aforementioned creationist view that there are only two alternatives, the presentation of evolution as “theory not fact,” like other efforts to denigrate evolution, has the effect of promoting the view of special creationism.

“Theory Not Fact” Policies Are Promoted By Creationists to Denigrate Evolution and Advance Creationism

The contention that evolution should be presented as “theory not fact” began at least as early as the 1920s, shortly after the creation of the American religious movement called Fundamentalism. Along with the supposed incompatibility of evolution with Christianity, arguments that evolution is unsubstantiated “theory” were used to support the subsequent campaign to ban the teaching of evolution. In 1925 – the same year as the Scopes trial – the state of California was deciding upon textbooks to approve for use at the K– 12 level. It was decided that only books that presented evolution as a theory “rather than a fact” would be acceptable.^{32, 33} Newspaper articles reported that the board of education members were made aware of religiously-based public sentiment against evolution in the textbooks. Petitions were received from Baptist and Presbyterian churches protesting the teaching of evolution as being offensive to their religious views. In opposition, a representative from the Scientists League of America

³² Anonymous. 1925. “Textbook Row Near; Evolution Fight in California; Education Board to Decide What Works To Be Used in State; Teaching of Darwinism as Theory Permissible But Not as Fact.” *Los Angeles Times*, July 22.

³³ Kingsley, Philip. 1925. “9 Wise Men Prepared to Back Defense; Evolution Teaching OK Here – As Theory”. *San Francisco Chronicle*, July 16, 1.

protested that the “State Board of Education [ought have] no interest in the question of whether the textbooks used in our public schools are in conformity with the Bible....”

According to a detailed Ph.D. dissertation written by Richard Wilhelm,³⁴ between 1922 and 1978, there were 72 legislative actions (bills, amendments, or resolutions) submitted in 27 state legislatures that attempted to regulate the teaching of evolution. During this period, most of the attempts to prevent evolution from being taught “as fact” occurred towards the end of this time span, between 1964 and 1978. Almost none of these bills became law, but many were seriously debated and only narrowly defeated. The most successful was Tennessee’s SB 394, passed in 1974, which stated, in part:

Any biology textbook used for teaching in the public schools, which expresses an opinion, or relates a theory about origins or creation of man and his world shall be prohibited from being used as a textbook in such system unless it specifically states that it is a theory as to the origin and creation of man and his world and is not represented to be scientific fact.³⁵

The Tennessee law was not only a “theory not fact” provision, it was also a “Genesis Bill,” calling for equal time for biblical creationism:

Any textbooks so used in the public education system which expresses an opinion or relates to a theory or theories shall give in the same textbook and under the same subject commensurate attention to, and an equal amount of emphasis on, the origins and creation of man and his world as the same is recorded in other theories, including, but not limited to, the Genesis account in the Bible.³⁶

Again, the link is made between promoting creationism and denigrating evolution — in this case, a “theory not fact” policy. As mentioned, the Tennessee law was struck down in *Daniel v. Waters*, *op cit*.

Wilhelm’s dissertation covers only the period from 1922 until 1978, but of course efforts to denigrate evolution continue to the present day. With the opening of its national office in 1987, the National Center for Science Education systematically began monitoring the creationism and evolution controversy. The archives of the NCSE cannot claim to be a complete record of the creationism/evolution controversy in the United States, but they do contain extensive information about how this controversy plays out at the local and state level – which are the most important levels at which decisions about public-school education are made. Information archived at NCSE include newspaper clippings; correspondence with citizens and decision-

³⁴ Wilhelm, Richard David. (1978). *A Chronology and Analysis of Regulatory Actions Relating to the Teaching of Evolution in Public Schools*, University of Texas, Austin, TX.

³⁵ Lightner, Jerry P. 1975. “Tennessee “Genesis Law” Ruled Unconstitutional.” In *A Compendium of Information on the Theory of Evolution and the Evolution-Creationism controversy*, edited by J. P. Lightner. Reston, Virginia: The National Association of Biology Teachers. p. 27-28.

³⁶ Lightner, *op. cit.*, p. 28.

makers at the local and state levels; and books and articles analyzing individual cases, and the creationism/evolution issue as a whole.

Perusal of the NCSE archives show clearly that “theory not fact” policies and other policies denigrating evolution are uniformly proposed by antievolutionists: there are no examples of cases where such policies have been proposed to promote the scientific enlightenment of students. This would of course be highly unlikely, given the solid position of evolution in the world of science.³⁷ Evolution is denigrated not by scientists but by individuals and organizations whose goal it is to promote the sectarian religious belief of special creationism. In most cases, this is made clear by comments upon and justifications presented for such policies in public discussions – comments and justifications made by both policy makers and citizens. In many cases in which NCSE has participated as an adviser to citizens in a community, or has monitored from a distance, the community is divided over whether such antievolution policies should be accepted. Because school board members are elected officials, they monitor the electorate; if it appears that a large majority of citizens approve of such policies, creationist policies are more likely to be passed. In situations where the community consists of citizens some of whom favor and others disfavor the policies, school board members are less likely to pass such policies.

There are examples, however, where a school board, even though faced with a divided community, nonetheless threw its support to those who had a religious purpose. In some cases, the school board members themselves were open about their religious motivation for passing the policies. In any event, when the majority of the school board takes sides with that portion of a divided community that wishes to advance a religious agenda, science education suffers.

An example of a “theory not fact” policy from the 1970s is a textbook disclaimer requirement passed by the Texas State Board of Education in 1974. It required, in part, that “Textbooks presented for adoption which treat the subject of evolution substantively in explaining the historical origins of man shall be edited, if necessary, to clarify that the treatment is theoretical rather than factually verifiable. Furthermore, each textbook must carry a statement on an introductory page that any material on evolution included in the book is clearly presented as theory rather than verified.”³⁸ In 1984, an attorney general’s opinion³⁹ declaring the disclaimer unconstitutional finally ended a policy that had exerted a particularly pernicious effect upon evolution education in Texas for several years. As part of the decision, the Attorney General wrote:

Clearly, the board made an effort, as it has stated, to ‘insure neutrality in the treatment of subjects upon which beliefs and viewpoints differ dramatically.’ In our opinion, however, the board, in its desire not to offend any religious group, has injected religious considerations into an area which must be, at least in the public school context, strictly the province of science.

³⁷ National Academy of Sciences (U.S.). 1999. *Science and Creationism : A View From the National Academy of Sciences*. 2nd ed. Washington, DC: National Academy Press.

³⁸ Scott, Eugenie C., 1995, *op. cit.*, p. 206

³⁹ Mattox, Jim, Tom Green, David R. Richards, Rick Gilpin. 1984. Opinion no. JM-134. Office of the Attorney General, State of Texas.

He then goes on to cite *Wright v. Houston* that "... it is not the business of government to suppress real or imagined attacks upon a particular religious doctrine. ... Teachers of science in the public schools should not be expected to avoid the discussion of every scientific issue on which some religion claims expertise."

Because Texas is a highly populous state, it purchases a large number of textbooks; publishers energetically seek to get their books on the "approved" list. If selling textbooks in Texas requires watering down the coverage of evolution, many textbook publishers are willing to do so.⁴⁰ Because books published for Texas also are sold in other states, the Texas "theory not fact" textbook disclaimer had an effect far beyond the borders of this state. The large textbook publisher Holt, Rinehart & Winston "reduced the number of words relating to evolution in *Modern Biology*, the country's largest selling biology textbook, from 18,211 in 1973 to 12,807 in 1981. (The book carries on its introductory page a Texas-inspired disclaimer stating that the material on evolution is presented 'as theory rather than fact.')⁴¹

An example of a "theory not fact" policy from the 1990s is a Tennessee law that was only narrowly defeated after passing the requisite committees and also surviving debate on the House floor. The bill was unusually draconian, requiring that: "No teacher or administrator in a local education agency shall teach the theory of evolution except as a scientific theory. Any teacher or administrator teaching such theory as fact commits insubordination, as defined in Section 49-5-501(s)(6), and shall be dismissed or suspended as provided in Section 49-5-511." The final vote in the Senate, in which the bill was narrowly defeated, was preceded by a series of state legislators each proclaiming their Christian faith. Even some legislators voting against the bill proclaimed their Christian faith, but excused their negative votes on the grounds that they didn't want Tennessee to be once again the butt of jokes as it had been in 1925. Newspaper articles also attested to community pressure from religious conservatives to pass the bill.

Perhaps the most notorious textbook disclaimer of the 1990s, however, is the infamous Alabama disclaimer of 1996, which became the model for textbook disclaimers in several states and communities around the country over the next several years. This was an unusually detailed disclaimer that informed students that "No one was present when life first appeared on earth. Therefore, any statement about life's origins should be considered as theory, not fact." It then went on to confuse students about the definition of evolution, and to list a number of traditional creationist examples of alleged "evidence against evolution" intended to make students reject evolution as valid science. Here again, contemporary press reports support the conclusion that such policies are proposed by those wishing to promote the narrow sectarian Christian view of special creation.

The Alabama "theory not fact" disclaimer was picked up by the small community of Beebe, Arkansas, in the mid-1990s, but modified in the early 2000s to include a reference to intelligent

⁴⁰ Thomas Jukes quotes a publisher as saying, "You're not going to find the word 'evolution' in the new textbook *Experiences in Biology*. The reason for self-censorship is to avoid ...controversy. We'd like to sell thousands of copies". Jukes, Thomas H. 1984. "The Creationist Challenge to Science". *Nature* 308 (5958):398-400, p. 400.

⁴¹ Anonymous. 1984. "The Texas Textbook Censors: Bad for the Image." *Discover*, January, 6.

design creationism. The Beebe disclaimer began with wording identical to that of the Alabama disclaimer, but then inserted a modification:

This textbook discusses evolution, a controversial theory some scientists present as a scientific explanation for the origin of living things, such as plants, animals and humans. *Many people believe that evolution alone is not adequate to explain the origins of life. For these people, the idea of an intelligent designer seems to make sense.* (Emphasis added)

The disclaimer then continued with the familiar Alabama wording, “No one was present when life first appeared on earth. Therefore, any statement about life’s origins should be considered as theory, not fact.” It also included the Alabama disclaimer’s bulleted list of creationist arguments supposedly questioning the validity of evolution. The Beebe disclaimer illustrates the equation of intelligent design with creationism. In July 2005, citing fear of a lawsuit after the decision in *Selman v. Cobb County* was issued, the Beebe Board of Education agreed to take the stickers out of the book.⁴²

A requirement for an oral disclaimer was passed by the Louisiana parish of Tangipahoa in 1994. Although it did not use the specific term “fact,” the disclaimer to be read to students was specifically indicated as “a disclaimer from endorsement of such theory,” as if the Tangipahoa Board of Education wanted students to be clear that the governing body of the school district discouraged them from accepting evolution. In 1997 the measure was declared unconstitutional by a district court in *Freiler et al v. Tangipahoa Parish Board of Education*⁴³ on the grounds that the disclaimer promoted Biblical Christianity. The disclaimer included the sentiment that evolution “should be presented to inform students of the scientific concept and not intended to influence or dissuade the Biblical version of Creation or any other concept.”

“Theory not fact” policies continue to proliferate into the 21st century. In the fall of 2003, a controversy sprang up in Washakie County, Wyoming, over the teaching of evolution as “theory not fact” (and an encouragement of the teaching of “evidence against evolution”). The policy read:

It shall be the policy of the Washakie County School District No. 1 when teaching Darwin’s theory of evolution that it is only a theory and not a fact. Teachers shall be allowed in a neutral and objective manner to introduce all scientific theories of origin, and the students may be allowed to discuss all aspects of the controversy surrounding the lack of scientific evidence in support of the theory of evolution.

News accounts of the Washakie controversy attest to the testimony of pastors encouraging the

⁴² McCoy, Joan. 2005. “Board Votes to Remove Stickers”. *The Arkansas Leader*, July 13. Available at <http://www.arkansasleader.com/2005/07/top-story-board-votes-to-remove.html> (accessed 11/8/06).

⁴³ *Freiler et al. v. Tangipahoa Parish Board of Education*, 975 F. Supp. 819 (E. D. La. 1997).

denigration of evolution as weak science and the introduction of intelligent design creationism.⁴⁴ In a later school board meeting, the Washakie policy was adjusted to encourage the teaching of intelligent design as well as denigration of evolution.⁴⁵ This linking of “theory not fact” or other denigrations of evolution with the teaching of some form of creationism is not uncommon: lacking positive scientific evidence for special creation, the content of creation science and intelligent design defaults to “evidence against evolution” in its various forms. Other instances of “theory not fact” policies since 2000 are recorded in NCSE’s archives, including in the communities of Bakersfield, California, Lancaster, California, Oshkosh, Wisconsin, and other communities. During this half-decade, there also have been several pieces of legislation promoting “theory not fact” policies, which can be made available if the court wishes.

Perhaps the most important manifestation of “theory not fact” policies since 2000 is the pro-intelligent design policy passed by the Dover, Pennsylvania, school district in 2004. This policy read, in part, “Because Darwin’s Theory is a theory, it is still being tested as new evidence is discovered. The Theory is not a fact. Gaps in the Theory exist for which there is no evidence.” Both parts of this “theory not fact”/intelligent design hybrid policy were struck down in federal district court in *Kitzmiller v. Dover*, in December 2005. Judge John E. Jones III ruled that intelligent design is a form of creationism, and also that policies denigrating evolution are part of the creationist program. Specifically referring to “theory not fact” policies, Jones cited *Selman v. Cobb County* that such policies are “one of the latest strategies to dilute evolution instruction employed by antievolutionists with religious motivations.”

5. History of Creationism in Georgia

My understanding of the history of creationism in Georgia comes from the sources cited, especially the articles by Georgia professor Kenneth Saladin, who carefully researched this topic using primary sources in the records of the Georgia courts. The recent history comes from my involvement as director of NCSE, and my personal knowledge of legislation submitted.

Opposition to evolution in Georgia has deep roots. Like those in other southern states, Georgia legislators were enthusiastic over Scopes-type antievolution laws in the 1920s. William Jennings Bryan, in fact, visited Georgia to promote a “theory not fact” bill. In 1923, he urged the Georgia House to pass a bill that would “forbid teachers from teaching evolution as a fact, declaring that they had no right to present it to their pupils as anything other than a theory or hypothesis.”⁴⁶

Although this and subsequent bills in 1923 and 1924 failed, the topic generated considerable discussion and controversy. After about 1930, efforts to ban the teaching of evolution declined in Georgia as well as in other states, mostly because by that time evolution had essentially vanished

⁴⁴ Anonymous. 2003. “School Board Gives Nod to Creationism, Abstinence-only”. *Star Tribune*, August 31.

⁴⁵ Schneider, Zachary. 2003. “Washakie School Board Weighs ‘Intelligent Design’”. *Star-Tribune*, October 12.

⁴⁶ Saladin, Kenneth S. 1983. Sixty Years of Creationism in Georgia. *Society* 20 (2):17-25, p. 19

from the high school curriculum owing to textbook publishers removing it from their books.⁴⁷ There was little antievolution activity in Georgia until the 1960s, when evolution returned to the high school curriculum. In 1973, Georgia's legislature debated a "Genesis" bill calling for equal time for evolution and special creationism. It was rejected largely for "local option" reasons: lawmakers felt they did not need to legislate the teaching of creationism because the state had approved a creation science textbook, *Biology: A Search For Order in Complexity*, and if districts wished to bring creationism into the classroom, the availability of the book on the approved list would facilitate this.⁴⁸ This book remained on the approved list for a decade, even after its use had been declared an unconstitutional advancement of religion in an Indiana State Court in 1977.⁴⁹

In 1979, the earlier Genesis bill was rewritten as an equal time for evolution and creation science bill, and almost passed both houses. It was proposed by a young minister recently elected to the House, Tommy Smith. Opponents of the bill sought to keep it bottled up in committee, noting how difficult it would be to vote against it on the House or Senate floor. The main reason given for stalling the bill was financial – not that creation science was poor science education.⁵⁰ Judge Braswell Deen, Chief Justice of the Appeals Court, enthusiastically combated evolution in speeches, articles, and even a college-level course at Oglethorpe University (soon ended due to protests from the science faculty).⁵¹ Rejecting evolution for religious and moral reasons, he once famously claimed that "This monkey mythology of Darwin is the cause of permissiveness, promiscuity, pills, prophylactics, perversions, pregnancies, abortions, pornotherapy [sic], pollution, poisoning, and proliferation of crimes of all types."⁵²

Smith again tried to get his bill passed in 1981 and 1982, and failed. Discouraged by the rout of creation science in the *McLean* decision, Smith ceased his efforts for equal time for creation science legislation after 1982, and no one else in the legislature took up his campaign for the rest of the decade.

In 1996 the legislature again considered evolution education, although rather than calling for "balancing" the teaching of evolution with the teaching of creationism, the new bill called for an "evidence against evolution" approach. The bill read,

As part of any science curriculum wherein students are taught concerning the origins of life and living things, including the origins of humankind, teachers shall have the right to

⁴⁷ Grabiner, Judith V. and Peter D. Miller. 1974. Effects of the Scopes Trial. *Science* 185 (4154):832-837.

⁴⁸ Saladin, Kenneth S. 1986. Educational Approaches to Creationist Politics in Georgie. In *Science and Creation: Geological, Theological, and Educational Perspectives*, edited by R. W. Hanson. New York: MacMillan Publishing Co.

⁴⁹ *Hendren v. Campbell* Sup. Ct. No. 5, Marion County, Indiana (1977)

⁵⁰ Saladin, 1986, op. cit.

⁵¹ Saladin, 1983, op. cit. p. 20

⁵² Nelkin, Dorothy. 1982. "From Dayton to Little Rock: Creationism Evolves". *Science, Technology, & Human Values* 7 (40): 47-53, p. 47, citing an article in *Time*, March 16, 1982, p. 82.

present and critique any and all scientific theories about such origins and all facts thereof, including without limitation scientific theories other than evolutionism.

The bill failed, but evolution education was also an issue at the state Department of Education. Linda Schrenko, the state Superintendent of Education, was a proponent of creationism and other Bible-based curricula. In February 1996, she requested a ruling from the state attorney general as to whether it was legal to teach creationism in science class. The answer she received, in March 1996, was that it was not. She also asked, “If evolution is taught, should we balance the curriculum with creationism or refer this matter to parents?” The answer was that *Edwards* held that balancing evolution with the teaching of creationism unconstitutional. Her third question reflected a theme that has come up many times in Georgia: “If we teach only evolution, we are at cross purposes with what many parents teach at home and certainly what is taught in our churches. Do we have the right to do so?” The Attorney General responded that any alternatives to evolution must have a secular purpose. Note that there is an assumption in Schrenko’s question that evolution necessarily conflicts with religion: she contended that evolution is “certainly” at “cross purposes” with “what is taught in our churches.” On the contrary, evolution is compatible with what is taught in *many* churches; Schrenko’s concern reflects a narrow sectarian view. The question itself reflects a religious purpose in its asking.

Legislators had not given up on legislating restrictions on evolution education, however, and were back in 1998 with another “evidence against evolution” law, which read:

Whenever a theory of the origin of humans or other living things that might commonly be referred to as ‘evolution’ is included in a course of study offered by a local unit of administration, both scientific evidence supporting or consistent with the theory and scientific evidence problematic for, inconsistent with, or not supporting the theory shall be included.

The wording of this legislation had been circulated to state legislators by creationists, and had been proposed in Ohio and in other states. This legislation also failed. Antievolution legislation was also submitted in 2001 and 2005, according to NCSE archives.

The most recent Georgia state-level controversy over evolution concerned the establishment of the state science education standards in 2004. By mandate of the federal No Child Left behind education bill, states must begin testing public school students for proficiency in science by the year 2007. As a result, most states have been revising their science education standards over the last five years; Georgia is no exception. In February 2004, the state Department of Education released the first draft of the proposed science standards. The topic of evolution was omitted, amid protests from scientists and other citizens, as well as national science organizations such as the American Association for the Advancement of Science and the Council for Basic Education.

The state Superintendent of Education, Kathy Cox, had deleted evolution from the standards on the grounds that it would “make it easier for teachers”; the Georgia Science Teachers Association vehemently disagreed. Evolution eventually was restored to the Georgia science standards, partly as a result of pressure from the governor.

It is clear that there has been a pattern in Georgia for public officials to try to assuage the religious concerns of creationists by compromising science education. Either evolution is omitted, or it is given cursory treatment, or it is qualified in some fashion to signal to students that they needn't pay attention to it – or to their teachers who are attempting to teach it.

6. Creationism in Cobb County

My knowledge of creationism in Cobb County comes from NCSE archival material, and from personal contact with citizens, teachers and administrators in the country. NCSE monitors the creationism/evolution controversy nation-wide; as Cobb County has been a hotbed of creationist sympathies for over two decades, it certainly has been a community of interest to NCSE.

As with the rest of Georgia, evolution education in Cobb County, Georgia, has been a perennial sore spot. A controversy over evolution erupted in Cobb County in 1979 when the Cobb School Board approved on a 7–0 vote a “balanced treatment of evolution” resolution submitted by board member John McClure. The goal of the policy was to teach creation science along with evolution. The district spent \$7,600 on instructional materials purchased from two creationist organizations, the Institute for Creation Research and the Creation Research Society. Teachers protested both the policy and the instructional materials, rating them as scientifically and pedagogically substandard,⁵³ and according to one source, threatened to strike if the policy wasn't rescinded.⁵⁴

In the mid-1980s, the district became embroiled in a controversy over the alleged teaching of “humanism” as part of a values clarification exercise in the elementary school classes.⁵⁵ One of the people who had been central in promoting creationism in the 1980s, Carolyn Sanford, was prominent in this controversy as well. She included evolution education as part of the breakdown of morals in society that she saw as part of a creeping influence of “humanism” in the schools. To try to settle the issue, the Superintendent's office circulated a memo restricting classroom discussion on a number of topics, including “evolution, abortion, communism, religion, and [values clarification]”.⁵⁶ This memo, “Standard Practices to be Observed With Instructional Materials for Selected Curriculum Topics,” was circulated to teachers in December 1984. Although teachers were permitted to supplement the county-approved instructional materials for all other controversial topics, materials used for teaching evolution were restricted to “that selected and purchased through county procedures.”⁵⁷ The policy was protested by the president-elect of the citizens group, Georgia Council for Science Education, Paula Eglin, a biology teacher in Cobb County. Because there were at the time no written guidelines for teaching evolution in Cobb County, the restriction on instructional materials were seen as a

⁵³ Saladin, Kenneth S. 1984. Teachers Denied Normal Latitude in Teaching Evolution. *Quarterly Newsletter of the Georgia Council for Science Education* 3 (4).

⁵⁴ Anonymous. 1980. New Battle Over Teaching of Evolution. *U.S. News and World Report*, June 9, 82.

⁵⁵ Howard, Susan. 1985. Classroom Wars. *Atlanta Journal and the Atlanta Constitution*, April 21.

⁵⁶ Hechinger, Fred M. 1985. About Education; Far Right Steps Up Effort To Control Classrooms. *New York Times*, April 16, 10.

⁵⁷ Saladin, 1986, op. cit. p.111.

burden by teachers.⁵⁸ The policy remained in place.

In the mid-1990s, evolution returned to Cobb County as a controversial issue, when parents complained about the inclusion of a few pages about the origin of the solar system and Earth in a fourth-grade science book. Parents Jeffrey and Beth Wright objected to the Macmillan/McGraw-Hill book *Changing Earth* because one chapter, “The Birth of Earth,” included a discussion of different theories about the origin of the solar system, and also mentioned — briefly — the Big Bang. The Wrights were quite clear that their objections to the book were because it conflicted with their biblically based views of creation. To quote from a news story: “We’re not fanatics,” says Beth Wright, “but we believe in creation. If creation isn’t being taught, then nothing should be taught.”⁵⁹ The Board of Education, arguing that the topic of the evolution of the earth wasn’t part of the fourth grade curriculum anyway, requested that the publisher reprint the books deleting pages 72–85. The publisher agreed, which generated a considerable amount of discussion in the community, including fiery letters to the editor from both sides of the controversy. During the course of this controversy, reporters uncovered the fact that the official Cobb County policy “Theories of Origin,” Policy IDBD, proscribed the teaching of human evolution in several ways. The policy, originally passed in December of 1979, had undergone a number of revisions, the most recent in August of 1995. This policy would, in a few years, be seen to conflict with the contents of new textbooks.

During the next cycle of textbook adoptions, beginning in 2001, the 1995 policy conflicted with both the new state science education standards and the scientific content of commercially available textbooks, the vast majority of which include the topic of evolution. The decision of the School Board to require that science textbooks have a “theory not fact” disclaimer sticker is the topic of the trial. During this period, I and other NCSE staff were in touch with citizens of Cobb County, including some school district personnel, who objected to the denigration of evolution by way of a textbook disclaimer sticker. When it became clear that the disclaimer was not stoppable, we provided advice on alternative language that we believed had more integrity than the “theory not fact” sticker that was finally voted in.

My opinion is that decision of the state Board of Education to disclaim the textbooks was religiously motivated. The Board of Education favored that segment of the citizenry with religious objections to evolution over that segment of the citizenry seeking a standard science education for students in the district. Given the long history of contention over the teaching of evolution in Cobb County, and the obvious religious motivations of those who object to the teaching of evolution, the board must have realized that it was making a policy decision which favored a sectarian religious view. As will be discussed below, there is no pedagogical reason for the disclaimer policy; such policies are not promoted by scientists and educators but by people who object to the teaching of evolution on religious grounds.

“Theory not Fact” Policies Are Pedagogically Harmful

⁵⁸ Saladin, 1984, op. cit.

⁵⁹ Greising, David. 1996. Monkey Business in the Classroom. *Business Week*, June 10, 1996, 38.

I have taught science and evolution at the university level, and since becoming director of NCSE, have taught workshops for K-12 teachers and have had other extensive interaction with classroom teachers and administrators. I believe I am qualified to comment on pedagogical matters regarding the teaching of science as a way of knowing, and upon the teaching of evolution. I am recognized as an expert on these topics by other scientists, and by professional science educators at the National Science Teachers Association, and the National Association of Biology Teachers. I have written articles on teaching evolution, and articles for teachers on how to teach evolution while minimizing opposition. I am qualified to comment on the pedagogical issues related to the misunderstanding of the terms “theory not fact” and how they relate to attempts to interject religion into the science classroom.

What is the pedagogical value of a “theory not fact” disclaimer sticker in a textbook? It is my opinion that there is no enhancement of the learning experience whatsoever, and in fact, such practices result in negative educational outcomes. “Theory not fact” policies are of course a component of the long-standing creationist strategy of denigration of evolution, which in itself is a means of promoting special creationism. This is due to the well-known dichotomous creationist mindset in which creationism and evolution are seen as polar opposites between which a choice must be made. “Evidence against evolution” is therefore “evidence for creationism.” According to creationists, instilling in students’ minds that evolution is “just a theory”, something to be ignored, will encourage them to believe in creationism.

If there were genuine scientific evidence against evolution, *i.e.*, if scientists actually had scientific debates over whether evolution occurred there might be a secular pedagogical reason for teaching students to question the reality of evolution. The scientific community, however, overwhelmingly views evolution (the inference of common descent of living things) as a solidly-supported scientific view. Indeed, the consensus of the scientific community is that “[t]he contemporary theory of biological evolution is one of the most robust products of scientific inquiry.”⁶⁰ The professional organizations of science teachers agree with the scientists. The National Association of Biology Teachers states “Modern biologists constantly study, ponder and deliberate the patterns, mechanisms and pace of evolution, but they do not debate evolution’s occurrence.”⁶¹ Similarly, the National Science Teachers Association has stated, “There is no longer a debate among scientists over whether evolution has taken place,” and specifically recommends that “[p]olicy-makers and administrators should not mandate policies requiring the teaching of creation science or related concepts such as ‘intelligent design’, ‘abrupt appearance’, and ‘arguments against evolution’” (emphasis given).⁶²

The expectation of professional educational societies such as NSTA and NABT is that their members will teach evolution without compromise: their responsibility to students is to present

⁶⁰ American Association for the Advancement of Science, AAAS Board Resolution on Intelligent Design Theory, 2002, available on-line at <http://www.aaas.org/news.releases/2002/1106id2.shtml>. The AAAS is the largest general scientific society in the world.

⁶¹ National Association of Biology Teachers (2004). “NABT’s Statement on Teaching Evolution.” http://nabt.org/sub/position_statements/evolution_supportingmaterial.asp

⁶² NSTA (National Science Teachers Association) Position Statement on the Teaching of Evolution, in *Teaching About Evolution and the Nature of Science*, pp. 125, 124.

the consensus view of science. In fact, it is widely recognized that the job of the public-school science teacher is to introduce students to the basic and central methods and results of mainstream science. Because the scientific community rejects the idea that there is any credible scientific evidence against evolution, it would be inappropriate and unprofessional for science teachers to suggest otherwise.⁶³ Such disclaimers, then, put teachers in the position of having to choose between the district and their professional responsibilities: either they contradict the disclaimer, or they are forced to comply with or acquiesce to educational policies that their professional standards consider pedagogically unsound.

Furthermore, the policy is likely to bring religion into the science classroom, as students may well ask why the disclaimer was affixed to the books. This could lead to a discussion of views that the science teacher is not trained to deal with, and that are unnecessary distractions from the proper concerns of a science classroom.

In summary, my opinion regarding pedagogical aspects of this practice is that the “theory not fact” disclaimer sticker is pedagogically unsound because it sends the wrong message about the scientific status of evolution within the scientific community. It requires teachers to choose between their responsibility to their employers and their responsibility to their profession, and it entangles the science teacher with subject matter that he or she is not trained to deal with. The end result is likely to be that the amount of evolution learned will be reduced or even eliminated, to the detriment of the students’ education.

⁶³ National Association of Biology Teachers Statement on Teaching Evolution, op. cit.