

## **Darwin versus Intelligent Design in US Courts: Does Teaching Intelligent Design in Biology Classes Violate the US Constitution?**

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### **Abstract**

Darwinian evolution is accepted by the great majority of scientists as the method by which the diversity of earth's organisms, including humans, evolved. Current research continues to expand our knowledge of evolutionary mechanisms. However, certain religious groups, supporting teaching the creation of earth's species as outlined in Genesis ("Creationism"), challenge in US courts teaching only Darwinian evolution in biology classes. The Courts must decide whether teaching creationism violates the Constitution's First Amendment prohibiting government "establishment of religion". In a 2005 challenge (US District Court, Pennsylvania), a local school board mandated a disclaimer be read to biology classes stating there were gaps in Darwin's theory and that "Intelligent Design" (ID), propounded as science, provided a different explanation of life's origins. ID proposes that many living structures exhibit "irreducible complexity", could not have evolved via natural selection and, therefore, exhibit evidence of an intelligent designer. After expert testimony, the judge ruled (12/05) that ID was a form of religion, a modernized concept of creationism, and should not be taught in biology classes because it violated US and Pennsylvania Constitutions. Similar challenges to teaching Darwinian evolution are occurring in at least nine other US states.

### **Introduction**

#### **The Problem in the United States**

The first Amendment to the United States Constitution states that:

"Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof".

There are many other issues related to other sections of the First Amendment but this paper will only discuss issues related to this "Establishment Clause", often referred to as the separation of church and state. The 14th amendment to the US Constitution extends to this separation to all states. The Constitution of the Commonwealth Pennsylvania also prohibits the establishment of religion by the state.<sup>1</sup> An action is considered a violation of the First Amendment if the challenged government action (federal, state, local) advocates a particular form of religion. This amendment therefore applies to actions by state or local school boards in determining what should be taught in state supported public schools. If the action conveys a message of endorsement or disapproval of a type of religion, it may be challenged as unconstitutional under

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<sup>1</sup> Kitzmiller *et al.* v Dover School Board (DSB) 2005  
[http://www.talkorigins.org/faqs/doover/kitzmiller\\_v\\_dover\\_decision.html](http://www.talkorigins.org/faqs/doover/kitzmiller_v_dover_decision.html)  
p. 1. (accessed 2/14/06)

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the “Establishment Clause” of the First Amendment. The issue is then decided in US Federal Courts (94 District Courts, 12 Regional Courts of Appeals, One Supreme Court) because these courts resolve cases related to constitutional issues.

Currently in the United States, Fundamentalist Christians and other antievolutionists want “Intelligent Design” (ID) taught in high school biology classes to 15 and 16 year olds, as an alternative to the theory of evolution. This theory of evolution was first proposed by Charles Darwin in 1859 and has been greatly expanded and revised by the subsequent 145 years of scientific research.

As political conservatives have gained more public support in the US, and as states are required to have educational standards that include science, there are more challenges to the teaching of evolution in public schools. Proposals, of various forms, but hostile to teaching evolution, are being considered in at least nine US states.

Opposition to teaching biological evolution grew out of the religious tradition, Christian Fundamentalism. This fundamentalism began in the US in the 19th century in response to social change, new religious thought and the publication of Darwin’s *Origin of the Species*.<sup>2</sup> These opponents of evolution considered these developments as contrary to the teachings of the Bible and objected to Darwin’s theory of evolution as a scientific explanation for the diversity of species.<sup>3</sup> In response to an upsurge of the fundamentalist religious movement in the 1920’s, religiously motivated groups lobbied state legislatures to adopt laws to prohibit public schools from teaching evolution. This prohibition culminated in the Scopes (“Monkey”) trial in 1927 in

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<sup>2</sup> . McLean v. Arkansas Board of Education. 1982. Decision by U.S. District Court Judge William R. Overton. 1/5/82. <http://www.talkorigins.org/faqs/mclean-v-arkansas.html>. (accessed 3/15/06)

<sup>3</sup> Scott, E. C. 2004. *Evolution vs. Creationism*. An introduction. Greenwood Press Westport, CT.

Tennessee when a teacher was criminally prosecuted for teaching evolution in defiance of the state law prohibiting such teachings.<sup>4</sup>

Most states now have state educational standards for kindergarten through twelfth grade. These standards are established by state educational boards. In Pennsylvania, for example, the Academic Standards for Science and Technology require students to acquire knowledge and skills needed to explain the mechanisms of the theory of evolution.<sup>5</sup> However there are at least 17,000 local school boards in the US and these boards can decide how state standards are implemented in the local public schools<sup>6</sup>. According to the Thomas B. Fordham Institute, Pennsylvania received a “C” for its science standards, but a “sound” for the teaching of evolution.<sup>7</sup>

### **Why is teaching of biological evolution such a controversial subject in US?**

From Table 1 it is obvious that Americans are divided about the teaching of evolution in public schools. Because such a large number of US citizens do not accept or understand evolution, it is often just not taught in biology, unless mandated by state science standards. For example, because evolution is so controversial many high school teachers avoided the subject completely in the ‘50’s and ‘60’s or only made brief reference to it.<sup>8</sup> In addition there is considerable confusion among the American public caused by the terms creationism and evolution. Given the lack of understanding and acceptance of evolution, it is not surprising that such controversies have arisen concerning teaching evolution in science classes in public schools.

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<sup>4</sup> Scopes Trial 1927. <http://themonkeytrial.com> (accessed 5/10/06)

<sup>5</sup> Kitzmiller *et al.* v DSB. p 2.

<sup>6</sup> Gross, P. R., U. Goodenough, L. S. Lerner, S. Haack, M. Schwartz, R. Schwartz and C. E. Finn. 2005. *The State of State Science Standards 2005*. Thomas B. Fordham Institute, Washington, D.C. (accessed 5/4/06)  
<http://www.edexcellence.net/institute/publication/publication.cfm?id=52>

<sup>7</sup> *ibid*

<sup>8</sup> Miller, K. 1999. *Finding Darwin’s God*. HarperCollins, New York. p10

The teaching of evolution has been labeled a “national educational crisis”.<sup>9</sup> Even many college students in the US today have not learned about evolution in high school, therefore do not understand it’s premises. So evolution is also being challenged occasionally at the college and university levels.<sup>10</sup> The interim president of Cornell University (Ithaca, NY), Hunter Rawlings III, considered the teaching of ID such an important issue that he devoted his entire “State of the University’ address to it, with much emphasis on freedom of thought. President Rawlings stated “The issue in question is the challenge to science posed by religiously-based opposition to evolution, described, in its current form, as “intelligent design”.<sup>11</sup> He called ID a “religious belief masquerading as a secular idea”.<sup>12</sup>

Scientific illiteracy is a growing concern among scientists in the US.<sup>13</sup> According to evolutionary biologist Massimo Pigliucci, “more scientists ought to face the realities of public misunderstanding of science”<sup>14</sup>.

Another important question is: does the general public really understand what a scientific theory is? “The word ‘theory’ is the most misunderstood word in science”.<sup>15</sup> When evolution is deemed a theory, does the public understand what this means? To the general public “theory” implies a “guess” or a “hunch”. However to scientists, this is not the meaning. The National Academy of Sciences defines theory as “a well substantiated explanation of some aspect of the natural world that can incorporate facts, laws, inferences, and test hypotheses.”<sup>16</sup>

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<sup>9</sup> Nehm, R. H. 2006. “Faith-based evolution education?” *BioScience* 56 (8): 638-639

<sup>10</sup> Holden, C. 2006. “Darwin’s Place On Campus Is Secure – But Not Supreme.” *Science* 311: 769-771.

<sup>11</sup> Rawlings, H. R.. III. 2005. State of the University. Address to Cornell Board of Trustees and the University Council. 10/21/05

<sup>12</sup> . *ibid.*

<sup>13</sup> Gross, L. 2006. Scientific illiteracy and the partisan takeover of biology. *PloS Biol* 4(5): e167

<sup>14</sup> Pigliucci, M. 2006. Have we solved Darwin’s Dilemma? *American Scientist* 94: 272-274.

<sup>15</sup> Scott, E. C. 2004. *Evolution vs. Creationism*. p. 14

<sup>16</sup> National Academy of Sciences (NAS). 1998. *Teaching about Evolution and the Nature of Science*, National Academy Press, Washington, DC. p 7.

**Table 1**

**US Public Opinion Polls**

**Teaching Evolution and Creationism in Public Schools**

<b>Question</b>	<b>Percentage of US population</b>	<b>Source</b>
<b>Life on earth existed in present form since beginning of time</b>	<b>42</b>	<b>Pew Forum on Religion and Public Life 8/30/05 <sup>a</sup></b>
<b>White evangelical protestants</b>	<b>70</b>	<b>Pew Forum 2005</b>
<b>Mainline protestants</b>	<b>32</b>	<b>Pew Forum 2005</b>
<b>White Roman Catholics</b>	<b>31</b>	<b>Pew Forum 2005</b>
<b>Life evolved over time</b>	<b>48</b>	<b>Pew Forum 2005</b>
<b>Evolution guided by Supreme being</b>	<b>18</b>	<b>Pew Forum 2005</b>
<b>Evolution via natural selection</b>	<b>26</b>	<b>Pew Forum 2005</b>
<b>Don't know how life evolved</b>	<b>4</b>	<b>Pew Forum 2005</b>
<b>Don't know about evolution of life</b>	<b>10</b>	<b>Pew Forum 2005</b>
<b>Open to teaching creationism with evolution</b>	<b>64</b>	<b>Pew Forum 2005</b>

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<b>Replace evolution with teaching creationism</b>	<b>38</b>	<b>Pew Forum 2005</b>
<b>Students reporting being uncomfortable with subject of evolution in school</b>	<b>6</b>	<b>Pew Forum 2005</b>
<b>Parents should be primarily responsible for how evolution taught</b>	<b>41</b>	<b>Pew Forum 2005</b>
<b>School boards should be primarily responsible for how evolution taught</b>	<b>21</b>	<b>Pew Forum 2005</b>
<b>Scientists should be primarily responsible for how evolution taught</b>	<b>28</b>	<b>Pew Forum 2005</b>
<b>Reject theory of evolution, God created humans in present form (CBS News Poll 10/05) <sup>b</sup></b>	<b>51</b>	<b>Collins, NY Times 11/7/05 <sup>b</sup></b>

a. Pew Forum on Religion and Public Life. 2005. Public Divided on Origins of Life. Washington DC. 8/30/05 <http://pewforum.org/surveys/origins/#3> (accessed 3/3/06)

b. Collins, G. 2005. "An Evolutionist's Evolution." *New York Times*. 11/7/05

A theory is an explanation based on observation, reasoning, testing and support from many scientists. Therefore, scientists do not mean an unsubstantiated idea or hunch, but an idea that is highly likely and well supported by experimental and statistical evidence. A theory, as discussed by scientists, is different from the general public's understanding. Consequently, the average American does not understand the meaning of the theory of evolution.

The subject of the origin of life is even more controversial than the study of evolution, that happened once life arrived on Earth. The origin of life is within province of biology, but

biologists do not consider life's origins as part of evolutionary theory.<sup>17</sup> Evolution focuses on the evolution of life forms once life had originated<sup>18</sup>

Another factor contributing to American's misunderstanding of evolutionary theory is the treatment of the subject by the press. Rosenhouse, J. and G. Branch discuss the media (television, newspapers, magazines) coverage of the Dover trial and conclude that often reporters, with no scientific training, distorted the science, contributing further to public misunderstanding.<sup>19</sup> Antievolutionists encourage journalists to present both sides of the issue. This may lead to misconceptions on the part of the public that scientists are equally divided on the issue, when, in fact, the great majority of scientists enthusiastically accept evolution.<sup>20</sup>

### **What are the Legal Challenges to Teaching Creationism, Scientific Creationism and Creation Science?**

The teaching of creationism, the literal interpretation of the creation story from Genesis I, has created controversy since the Scopes Trial (Scopes v. Tennessee, Table 2) when a teacher was criminally prosecuted and found guilty of teaching evolution in his class when state law forbade it. This trial is the subject of the play *Inherit the Wind*, first performed in 1955.<sup>21</sup> Since then there have been many challenges to teaching evolution. The court system has been most vigilant in monitoring schools compliance with the "Establishment Clause" because the classroom should not

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<sup>17</sup> Matsumura, M. 2001. Eight major court decisions against teaching creationism as science. National Council on Science Education. Oakland, CA. 2 pp.

[www.ncseweb.org/resources/articles/3747\\_8\\_major\\_court\\_decisions\\_against\\_2\\_15\\_2](http://www.ncseweb.org/resources/articles/3747_8_major_court_decisions_against_2_15_2)

<sup>18</sup> *ibid.*

<sup>19</sup> Rosenhouse, J. and G. Branch. 2006. Media coverage of "Intelligent Design".  
*BioScience* 56 (3): 247-252

<sup>20</sup> *ibid.*

<sup>21</sup> Lawrence, J. and R. E. Lee 1955. *Inherit the Wind*. Bantam Books, New York.

be used to advance religious beliefs that may conflict with students' family beliefs.<sup>22</sup>

After *Epperson v. Arkansas* in 1968 (Table 2) when the US Supreme Court declared the teaching of Creationism was unconstitutional, evolution opponents proposed a “balanced treatment” for both evolution and the biblical version of creation, “Creationism”.<sup>23</sup> However, this tactic was also declared a violation of the “Establishment Clause”.<sup>24</sup> Then evolution opponents proposed scientific sounding subjects such as “Creation Science” and “Scientific Creationism” be taught as alternatives to evolution.<sup>25</sup> These opponents claimed that the creation story and the origins of man as written in the Book of Genesis, were supported by scientific data.

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<sup>22</sup> *Edwards et al. v. Aguillard et al.* 1987. No. 85-1513.

<http://www.talkorigins.org/faqs/edwards-v-aguillard.html> (accessed 2/20/06)

<sup>23</sup> *Kitzmiller et al. v. DSB.* P. 8

<sup>24</sup> *Daniels v. Waters* <http://www.talkorigins.org/faqs/daniel-v-waters.html> (accessed 5/5/06)

<sup>25</sup> *McLean v Arkansas Bd. Education* 1982 . 1/5/82.

<http://www.talkorigins.org/faqs/mclean-v-arkansas.html> (accessed 3/15/06)



**Table 2**  
**Relevant Court Decisions**  
**Constitutionality of Teaching Creationism as Science**

<b>DATE</b>	<b>NAME OF CASE</b>	<b>RESULTS</b>
1927	Scopes v. Tennessee	criminal prosecution of teacher for teaching evolution against Tennessee law <a href="http://www.themonkeytrial.com/">http://www.themonkeytrial.com/</a>
1968	Epperson v. Arkansas	US Supreme Court declared unconstitutional Arkansas law prohibiting teaching of evolution under “Establishment Clause” of 1 <sup>st</sup> Constitutional Amendment  <a href="http://www.talkorigins.org/faqs/epperson-v-arkansas.html">http://www.talkorigins.org/faqs/epperson-v-arkansas.html</a>
1975	Daniel v Waters - US Court of Appeals 6 <sup>th</sup> Circuit (TN, KY, OH)	Tennessee law requiring “balanced treatment” of teaching both evolution and creationism violated 1 <sup>st</sup> Amendment “Establishment” clause  <a href="http://www.talkorigins.org/faqs/daniel-v-waters.html">http://www.talkorigins.org/faqs/daniel-v-waters.html</a>
1982	McLean v. Arkansas Board Of Education	Federal District Court declared unconstitutional Arkansas law requiring creation science be taught with evolution - creation science was merely biblical creationism in a new guise - used “Lemon Test”* to evaluate the constitutionality of law  <a href="http://www.talkorigins.org/faqs/mclean-v-arkansas.html">http://www.talkorigins.org/faqs/mclean-v-arkansas.html</a>
1987	Edwards v. Aguillard No. 85-1513	US Supreme Court ruled unconstitutional Louisiana law requiring “balanced” treatment of creation science with evolution - Stated science curriculum restructured to conform to a particular religious viewpoint

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		<p>–</p> <p><b>Decision made a national prohibition against teaching creation science in US public schools</b></p> <p><b>the challenged law failed on all 3 prongs of “Lemon test”</b></p> <p><a href="http://www.talkorigins.org/faqs/edwards-v-aguillard.html">http://www.talkorigins.org/faqs/edwards-v-aguillard.html</a></p>
2005	<p><b>Kitzmiller <i>et al.</i> v. Dover Area School District <i>et al.</i></b></p>	<p><b>Federal District (Pennsylvania) Court ruled ID was religion, not science, and should not be taught in high school biology classes</b></p> <p><b>Decision based on previous court decisions and the “Lemon Test”</b></p> <p><a href="http://www.talkorigins.org/faqs/dover/kitzmiller_v_dover_decision.html">http://www.talkorigins.org/faqs/dover/kitzmiller_v_dover_decision.html</a></p>

However, this approach was also labeled a violation of the “Establishment Clause” (Table 2 - McLean v. Arkansas Board of Education 1982 ).<sup>26</sup> The Court stated that creation science rested on a “contrived dualism” that recognized only two possible explanations for life, the scientific theory of evolution and biblical creationism. According to this court decision, evolution and creationism were treated as mutually exclusive so that “one must accept the literal interpretation of Genesis or else believe in the godless system of evolution”.<sup>27</sup>

Creation-science includes the scientific evidence and related inferences that indicate:

- 1) Sudden creation of the universe, energy, and life from nothing;

<sup>26</sup> McLean v Arkansas Bd. Education 1982

<sup>27</sup> ibid

- 2) The insufficiency of mutation and natural selection in bringing about development of all living kinds from a single organism;
- 3) Changes only within fixed limits of originally created kinds of plants and animals;
- 4) Separate ancestry for man and apes;
- 5) Explanation of the earth's geology by catastrophism, including the Occurrence of a worldwide flood;
- 6) A relatively recent inception of the earth and living kinds. <sup>28</sup>

In Louisiana in 1987 there was another attempt at teaching the “balanced approach” by forbidding the teaching of evolution unless accompanied also by teaching creation science. <sup>29</sup>The US Supreme Court ruled this act also violated the “Establishment Clause” (Table2). The decision included a national prohibition against teaching creationism as science and, therefore, ended the hopes of antievolutionists to force public schools to teach any form of creationism <sup>30</sup> (Edwards v. Aguillard 1987 – Table 2). Neither Epperson v Arkansas nor Edwards v. Aguillard had any prohibitions against teaching creationism in religion or literature classes, the laws applied only to science classes.

### **What is the History of Intelligent Design?**

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<sup>28</sup> *ibid*

<sup>29</sup> Masci, D. 2005. From Darwin to Dover: An overview of important cases in the evolution debate. Pew Forum on Religion and Public Life. Washington, DC. 5 pp. (accessed 4/10/06)

<sup>30</sup> Edwards *et al.* v. Aguillard *et al.* 1987

Following the Edwards decision (Table 2), opponents of evolution chose the term “intelligent design” instead of “creationism”.<sup>31</sup> The term “intelligent design” first appeared in the first edition (1989) of the high school biology text, *Of Pandas and People* (*Pandas*) by P. David and D. Kenyon.<sup>32</sup> This text is considered to be the first intelligent design book.<sup>33</sup>

ID proponents think living organisms are too complex to be explained by any natural, random, mindless process such as natural selection. Complex organisms and their biochemical and structural components exhibit a design that can only be accounted for by invoking a very, very smart designer. However, ID maintains that life was created, but is generally silent about the creator’s identity.<sup>34</sup> According to Michael Behe “Some systems seem very difficult to form by such successive modifications – I call them irreducibly complex” *e.g* if you remove one single part from the cell structure, the structure will no longer function.<sup>35</sup> Irreducible complexity, states Behe, presents Darwinism with “unbridgeable chasms”.<sup>36</sup> One biological example Behe uses is the bacterial flagellum that contains thirty different proteins, all precisely arranged. If you remove anyone of the proteins, the flagellum will not spin.<sup>37</sup> Behe wonders how a gradual process of incremental improvement could build a flagellum needing all parts to function? Many biochemical systems cannot be built by natural selection working on mutations.<sup>38</sup> Therefore “irreducible complex” cells arise like irreducible complex mousetraps, someone designs them. A designer might have assembled the first cell, solving the problem of “irreducible complexity”, after which evolution may have proceeded by conventional means. The apes still evolved on the

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<sup>31</sup> Kitzmiller *et al.* v. DSB. p 24

<sup>32</sup> Davis, P. and D, Kenyon. 1993. (5<sup>th</sup> printing 2004). *Of Pandas and People. The Central Question of Biological Origins*. Foundation for Thought and Ethics, Richardson, TX.

<sup>33</sup> Matzke, M. 2004. Introduction: *Of Pandas and People*, the foundational work of the “Intelligent Design” movement. National Center for Science Education, Oakland, CA. 1 p.

<sup>34</sup> Orr, H. A. 2005. Devolution. Why intelligent design isn’t. *New Yorker* 5/30/05

<sup>35</sup> Behe, Michael. 2002. The challenge of irreducible complexity. *Natural History*, April

<sup>36</sup> Behe, M. 1996. *Darwin’s Black Box*. The Free Press. New York

<sup>37</sup> Behe, M. 2002. *Natural History*

<sup>38</sup> Orr 2005. *New Yorker*.

African savannah, but our cells harbor micro-machines engineered by an unnamed intelligence approximately four billion years ago.<sup>39</sup>

ID is not the same as biblical literalism.<sup>40</sup> ID advocates shun the “creationism” label and do not believe the earth was created in six days, nor that earth is only 10,000 yrs old, nor that the fossil record was laid down during Noah’s flood .<sup>41</sup> Proponents do acknowledge some evolutionary change over time, changes may occur within a species, but evolution alone cannot account for the myriad of species on earth today.<sup>42</sup>

Supporters of ID include the Center for Science and Culture at the Discovery Institute (CSCDI) in Seattle, Washington. This Center “supports research by scientists and other scholars challenging various aspects of neo-Darwinian theory”.<sup>43</sup> They have published articles and books on ID. Members of these organizations include: Phillip Johnson, an emeritus law professor and program advisor, Stephen Meyer, a philosopher and program director, and Jonathan Wells, Senior Fellow, who holds Ph.D’s in both molecular biology and religious studies. The scientific leaders are Scott Minnich, microbiologist and senior fellow at CSCDI and Michael Behe, a biochemist and author of the book *Darwin’s Black Box* (1996).<sup>44</sup>

“Intelligent Design proponents posit that the universe, or at least components of it, have been designed by an ‘intelligence’. They also claim that they can empirically distinguish intelligent design from that produced through natural processes (such as natural selection).”<sup>45</sup> The current form of ID came into existence after the Edwards case in 1987.<sup>46</sup> According to Dover trial witness Rev. John Haught, the only theologian to testify at the trial, the argument for ID is not a

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<sup>39</sup> *ibid.*

<sup>40</sup> Haught, J. F. 2003. *Deeper than Darwin* . Westview Press, Boulder, CO. p 125

<sup>41</sup> Orr 2005. *New Yorker*.

<sup>42</sup> Scott, E. 2004 *Evolution vs. Creationism* p 126 – 129

<sup>43</sup> Center for Science and Culture, Discovery Institute. <http://www.discovery.org.csc> (accessed 5/11/06)

<sup>44</sup> Behe, M. 1996. *Darwin’s Black Box*.

<sup>45</sup> Scott, E.. 2004. *Evolution vs. Creationism*. P. 117

<sup>46</sup> *Kitzmiller et al. v. DSB*. p 24.

new scientific argument, but is rather an old religious argument for the existence of God going back to Thomas Aquinas in the 13<sup>th</sup> century who “argued that design in nature points toward a supreme intelligence”.<sup>47</sup> Dr. Haught testified that Aquinas was explicit that this intelligent designer “everyone understands to be God.”<sup>48</sup> Professor Haught explained that in Western intellectual tradition, non-natural causes occupy a space reserved for ultimate religious explanations.<sup>49</sup>

Dr. Barbara Forrest, one of Plaintiffs’ expert witnesses, is the co-author of the book *Creationism’s Trojan Horse: the Wedge of Intelligent Design* by Forrest and Paul R. Gross. where they chronicled the history of ID.<sup>50</sup> Her testimony provided many statements by ID leaders that revealed ID’s religious, philosophical, and cultural content.<sup>51</sup>

### **Can Science Confirm the Supernatural?**

Can ID be confirmed by the scientific method? If certain biological structures and functions were designed by an unnamed intelligence, can science confirm this intelligence? Attributing unsolved problems about nature to causes and forces outside the natural world is a “science stopper”.<sup>52</sup> Due to the methods of science, once you attribute a cause to an untestable supernatural force, the proposition cannot be proven or disproven by scientific testing. Intelligent design (formerly Creationism, Creation Science) proposes to change the ground rules of science

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<sup>47</sup> Haught, J. F. 2005. Expert testimony p 7-8.  
<http://www2.ncseweb.org/kvd/experts/haught.pdf> (accessed 4/15/06)

<sup>48</sup> *ibid.*

<sup>49</sup> . Kitzmiller *et al.* v. DSB. p 30.

<sup>50</sup> Forrest, B. and P. R. Gross. 2004. *Creationism’s Trojan Horse: the Wedge of Intelligent Design*. Oxford University Press, New York.

<sup>51</sup> Kitzmiller *et al.* v. DSB. p 26

<sup>52</sup> Miller, K. 2005. expert testimony. pp 14-15  
<http://www2.ncseweb.org/kvd/experts/miller.pdf>. (accessed 4/20/06)

to include supernatural causation. According to *McLean vs. Arkansas Board of Education* this is a religious concept.<sup>53</sup>

The U.S. National Academy of Sciences has stated that intelligent design "and other claims of supernatural intervention in the origin of life" are not science because they cannot be tested by experiment, do not generate any predictions and propose no new hypotheses of their own.<sup>54</sup>

### **What is Biological Evolution?**

"Evolution-science" includes the scientific evidences and related inferences that indicate: (1) Emergence by naturalistic processes of the universe from disordered matter and emergence of life from nonlife; (2) The sufficiency of mutation and natural selection in bringing about development of present living kinds from simple earlier kinds; (3) Emergence by mutation and natural selection of present living kinds from simple earlier kinds; (4) Emergence of man from a common ancestor with apes; (5) Explanation of the earth's geology and the evolutionary sequence by uniformitarianism and (6) An inception several billion years ago of the earth and somewhat later of life.<sup>55</sup>

"The concept of biological evolution is one of the most important ideas ever generated by the application of scientific methods to the natural world. The evolution of all the organisms that live on Earth today from ancestors that lived in the past is at the core of genetics, biochemistry, neurobiology, physiology, ecology, and other biological disciplines. It helps to explain the emergence of new infectious diseases, the development of antibiotic resistance in bacteria, the agricultural relationships among wild and domestic plants and animals, the composition of

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<sup>53</sup> *McLean v Arkansas*. 1982.

<sup>54</sup> National Academy of Sciences. (NAS). 1999. *Science and Creationism. A View from the National Academy of Sciences*. 2<sup>nd</sup> Ed. National Academy Press, Wash DC.

<sup>55</sup> *McLean v Arkansas*. 1982

Earth's atmosphere, the molecular machinery of the cell, the similarities between human beings and other primates, and countless other features of the biological and physical world. As the great geneticist and evolutionist Theodosius Dobzhansky wrote in 1973, 'Nothing in biology makes sense except in the light of evolution.'<sup>56</sup> "The scientific consensus around evolution is overwhelming."<sup>57</sup>

Cell biologist Kenneth Miller stated in his testimony at the Dover trial, "All scientific ideas are subject to change, revision, and rejection if they are contradicted by new evidence, and evolution is not an exception. Nonetheless, in nearly a century and a half of investigation, not a single piece of scientific evidence has emerged to contradict the idea that a process of evolutionary change gave rise to the species that exist today. The concept of evolution, therefore, is not controversial within science, and is generally accepted as the central idea upon which all of modern biology is based."<sup>58</sup>

As biologists learned more about genetics, and biochemistry, they incorporated these new discoveries into evolutionary theory. A refinement of evolutionary theory, Neo-Darwinism, emerged incorporating the new fields of molecular genetics and enabling the testing of evolution at molecular level.<sup>59</sup>

Evolution made possible the development of fantastically complex features of organisms such as eyes, brains, *etc.* without the intervention of a designing mind. Evolution (change over time) results from the combined action of random mutations and natural selection, plus other documented processes such as the founder effect, bottleneck effect, etc. Random DNA mutations are usually detrimental, but rarely a mutation conveys advantage to the survival of the organism

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<sup>56</sup> National Academy of Science (NAS). 1999

<sup>57</sup> National Academy of Sciences (NAS). 1998.

<sup>58</sup> Miller, K. Expert testimony. 2005 pp 3-4.

<sup>59</sup> *ibid.*



and is passed on to the offspring. Over billions of years this process of incremental improvement allows for gradual emergence of organisms exquisitely adapted to their environments. An example here would be the giant tortoises of the Galapagos, found nowhere else on earth and uniquely adapted to eating plants on the islands, the only large herbivorous animals on the islands. Organisms with genes that adapt them well to their specific environment are favored (selected), flourish and leave offspring also well adapted to their environment. However, a trait beneficial in one environment may not be beneficial if the environment changes (e.g. warms, cools, loss of trees, etc.) or if an individual moves to different environment.

By 1870 nearly all biologists agreed that life evolved and by 1940 most biologists agreed that natural selection was a key force driving evolution. “Of course, like all good science, evolutionary theory continues to change as new data are gathered and new ways of thinking arise. .... researchers still debate such important questions as precisely how new species arise and why species become extinct. There is also uncertainty as to how life began.”<sup>60</sup>

### **Scientific Societies on Evolution**

The Royal Society, the United Kingdom national academy of science, stated that evolution is “recognized as the best explanation for the development of life on Earth from its beginnings and for the diversity of species” and it is “rightly taught as an essential part of biology and science courses in schools, colleges and universities across the world”.<sup>61</sup>

In February 2006, the Board of Directors of the world's largest general scientific organization, the American Association for the Advancement of Science (AAAS), “strongly denounced legislation and policies that would undermine the teaching of evolution” and “deprive students of

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<sup>60</sup> Miller, K. R. and J. S. Levine. 2004. *Biology* (high school textbook). Pearson – Prentice Hall, New York. p 383.

<sup>61</sup> Royal Society Royal Society UK. <http://www.royalsoc.ac.uk/news> (accessed 4/20/06)

the education they need to be informed and productive citizens in an increasingly technological, global community." <sup>62</sup> Across the United States, at least 14 laws are pending in eight states, differing in language and strategy, but, according to AAAS President Gilbert S. Omenn, "all [laws] would weaken science education" Omenn continued, "The AAAS Board of Directors opposes these attacks on the integrity of science and science education, They threaten not just the teaching of evolution, but students' understanding of the biological, physical, and geological sciences." <sup>63</sup>

Sigma Xi, the scientific research society, endorsed the AAAS statement supporting teaching evolution in schools. <sup>64</sup>

### **Politics and Public Education**

Politicians and religious leaders have become involved with school science curricula. US President George W. Bush endorsed teaching alternatives to evolution in public schools. He stated that schoolchildren should be taught about ID, "a view of creation that challenges established scientific thinking and promotes the idea that an unseen force is behind the development of humanity."<sup>65</sup> US Senator Rick Santorum (PA) said, "intelligent design is a legitimate scientific theory that should be taught in science classes". <sup>66</sup>

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<sup>62</sup> American Association for the Advancement of Science (AAAS) 2006  
<http://www.aaas.org/news/releases/2006/0219boardstatement.shtml> (accessed 3/17/06)

<sup>63</sup> ibid

<sup>64</sup> Sigma Xi. The Scientific Research Society. 2006  
<http://www.sigmaxi.org/resources/evolution/index.shtml> (accessed 3/30/06)

<sup>65</sup> Baker, P. and P. Slevin. 2005. Bush remarks on "Intelligent Design". *Washington Post* 8/3/05

<sup>66</sup> Orr. 2005. *New Yorker*.

### **Current Research on Evolution**

In 2005 “biologists made huge strides toward understanding the mechanisms by which living creatures evolve.”<sup>67</sup> AAAS called ‘Evolution in Action’ the “Breakthrough of the Year”: “In the years since the 1859 publication of *The Origin of the Species* , thousands of researchers have sketched life’s transitions and explored aspects of evolution Darwin never knew...Equipped with genome data and field observations of organisms from microbes to mammals, biologists made huge strides toward understanding the mechanisms by which living creatures evolve.”<sup>68</sup>

Evolution still occurs and has been observed in human genes within the last 5,000 to 15,000 years in Africa, East Asian and European populations.<sup>69</sup> The evolution of the immune system, a point of contention during the Dover trial, is also currently being traced.<sup>70</sup> Recent research also documents the evolution, via a series of mutations, of two hormone receptors from a common molecular ancestor. This evolution demonstrates a “reducible complexity” of a complex hormone system and suggests that certain biochemical systems may, in fact, evolve from previously existing molecules.<sup>71</sup>

### **Background of Trial in Fall 2005**

According to the New York Times , “For years, a lawyer for the Thomas More Law Center (TMLC) in Michigan visited school boards around the country searching for one willing to challenge evolution by teaching intelligent design, and to face a risky, high-profile trial.”<sup>72</sup> This non-profit law firm, founded in 1999, is run by two conservative Roman Catholics, Thomas

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<sup>67</sup> Culotta, E. and E. Pennisi. 2005. Breakthrough of the Year: Evolution in Action. *Science* 23:310(5756): 1878-1879

<sup>68</sup> Culotta, E. and E. Pennisi. 2005.

<sup>69</sup> Wade, Nicholas. 2006. “Still Evolving Human Genes Tell New Story”. *New York Times*. 3/7/06.

<sup>70</sup> Bottaro , A. M., M. A. Inlay and N. J. Matzke. 2005. Immunology in the spot light at the Dover “Intelligent Design” trial. *Nature Immunology* 7 (5):433-435

<sup>71</sup> Adami, C. 2006. “Reducible Complexity”. *Science* 312: 61-63

<sup>72</sup> Goodstein, L. 2005. “In Intelligent Design Case, a Cause in Search of a Lawsuit”. *New York Times*. 11/4/05

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Monaghan, former CEO of Domino's Pizza and Richard Thompson, a former prosecutor in Oakland County, Michigan.<sup>73</sup> According to Richard Thompson, president and chief counsel of TMLC, the role of the Center is to use courts "to change the culture" and their web site states their mission is "to protect Christians and their religious beliefs in the public square".<sup>74</sup>

The Dover Area School District is in south central Pennsylvania, near York. The District has 40,000 residents and 3700 school students with 1000 students in the high school. On October 18, 2004, the Dover Area School Board of Directors passed, by a 6-3 vote, the following resolution: "Students will be made aware of gaps/problems in Darwin's theory and of other theories of evolution including, but not limited to, intelligent design. Note: Origins of Life is not taught."<sup>75</sup>

On November 19, 2004, a press release from the Dover Area School District (DASD) stated that starting in January 2005, teachers would be required to read the following disclaimer to ninth grade biology classes at Dover High School:

"The Pennsylvania Academic Standards require students to learn about Darwin's Theory of Evolution and eventually to take a standardized test of which evolution is a part. Because Darwin's Theory is a theory, it continues to be tested as new evidence is discovered. The Theory is not a fact. Gaps in the Theory exist for which there is no evidence. A theory is defined as a well-tested explanation that unifies a broad range of observations. Intelligent Design is an explanation of the origin of life that differs from Darwin's view. The reference book, *Of Pandas and People* (Davis and Kenyon 1993) is available for students who might be interested in gaining an understanding of what Intelligent Design actually involves. With respect to any theory, students are encouraged to keep an open mind. The school leaves the discussion of the Origins of Life to individual students and their families. As a Standards-driven district, class

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<sup>73</sup> *ibid*

<sup>74</sup> Thomas More Law Center. <http://www.thomasmore.org/mission-defending.html>. (accessed 5/8/06)

<sup>75</sup> Kitzmiller *et al.* v. DSB. p 1.

instruction focuses upon preparing students to achieve proficiency on Standards-based assessments.”<sup>76</sup>

In February 2005 a letter explaining the ID policy was mailed to every household in the Dover School District along with the Board’s discussion and a defense of this curriculum change.

<sup>77</sup>

On December 14, 2004, eleven concerned parents (one a former school board member) and teachers, the Plaintiffs, filed a suit challenging the constitutional validity of the October 18, 2004 resolution and the November 19, 2004 press release, collectively “the ID Policy”. The policy was challenged in US Middle District Pennsylvania Court as a violation of the “Establishment Clause” of the First Constitutional Amendment. Lawyers for the plaintiffs were the law firm of Pepper Hamilton LLP<sup>78</sup>, the Pennsylvania Chapter of American Civil Liberties Union

(ACLU)<sup>79</sup>, and the Americans United for Separation of Church and State (AU).<sup>80</sup>

The defendants were the Dover School Board of the Dover Area School District (includes Dover Township, Washington Township and Dover Borough in York County, PA) and the Discovery Institute. Lawyers for the defendants were from the Thomas More Law Center, that affirms the rights of Christians to publicly practice their religion and express their religious

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<sup>76</sup> Kitzmiller *et al.* v. DSB. p 2.

<sup>77</sup> Kitzmiller *et al.* v. DSB. p 54.

<sup>78</sup> Pepper Hamilton Law Firm <http://www.pepperlaw.com/news.cfm?ID=943.0> (accessed 5/11/06). lawyers for plaintiffs, Kitzmiller *et al.* v. DSB-Eric Rothschild, Steve Harvey, Joseph Farber, Benjamin Mather and Thomas Schmidt

<sup>79</sup> American Civil Liberties Union. (ACLU) accessed (5/4/06)  
<http://www.aclu.org/religion/intelligentdesign/21779res20051123.html>  
Lawyers for plaintiffs = Withold Walczak and Paula Knudsen

<sup>80</sup> Americans United for Separation of Church and State (AU)  
[http://www.au.org/site/PageServer?pagename=issues\\_evolution](http://www.au.org/site/PageServer?pagename=issues_evolution) (accessed 5/4/06)  
lawyers for plaintiffs = Ayesha Khan, Richard Katskee, Alex Luchenitser

beliefs. “Our Founding fathers fought for a nation built on a foundation of religion and morality. Our lawyers are committed to restoring and preserving that foundation.”<sup>81</sup>

The trial started September 26, 2005 and ended on November 4, 2005. Expert witnesses who testified are listed in Table 3.

**Table 3 - Expert Witnesses \***  
**Kitzmiller et al. v. Dover Area School District - Trial 2005**

**For Plaintiffs:** Barbara Forrest, Ph.D., Professor of Philosophy, Southeastern Louisiana University, Hammond, LA.

John F. Haught, Ph.D., Professor of Theology, Georgetown University, Washington, DC.

Kenneth K. Miller, Ph.D., Professor of Biology, Brown University, Providence, RI.

Robert Pennock, Ph.D., Associate Professor of Science and Technology, and of Philosophy, Michigan State University, East Lansing, MI.

Brian Alters, Ph.D., Associate Professor of Education, McGill University, Montreal, Quebec, Canada

Kevin Padian, Ph.D., Professor of Integrative Biology and Curator of Museum of Paleontology, University of California, Berkeley, CA

**Rebuttal Expert: deposed, did not testify**

Jeffrey Shallit, Ph.D., Professor of Computer Science, University of Waterloo, Ontario, Canada

**For Defense:** Michael Behe, Ph.D. Professor of Biochemistry, Lehigh University, Bethlehem, PA

Scott Minnich, Ph.D., Associate Professor of Microbiology, University of Idaho, Moscow, ID.

**Deposed, but did not testify:**

Dick M. Carpenter II, Ph.D., Assistant Professor of Educational

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<sup>81</sup> Thomas More Law Center.

## Forum on Public Policy

Leadership, University of Colorado, Boulder, CO

Warren A. Nord, Ph.D., Director, Program in the Humanities and  
Human Values, University of North Carolina, Chapel Hill, NC.

### **Testimony Withdrawn:**

William Demski, Ph.D., Professor of Science and Theology, Southern  
Seminary, Louisville, KY.

**Rebuttal Experts:** Steve Fuller, Ph.D., Professor of Sociology, University of  
Warwick, Coventry, UK

**Withdrawn before deposition:** Stephen Meyer, Ph.D., Director and Senior  
Fellow, Discovery Institute Center for Science and Culture, Seattle, WA

\*Witness testimonies are available at <http://www2.ncseweb.org>.

### **Judge Jones Opinion 12/20/05**

This “Court’s findings of fact and conclusions of law which are based on the Court’s review of the evidence presented at trial, the testimony of witnesses at trial, the parties’ proposed findings of fact and conclusions of law with supporting briefs, other documents [numerous letters, amicus briefs and other correspondence in relation to case] and evidence in record and applicable law.” Various Amici Curiae briefs were filed, from biologists, the Discovery Institute, *Scipolicy*, the Journal of Science and Health Policy,<sup>82</sup> and the Foundation for Thought and Ethics.<sup>83</sup>

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<sup>82</sup> *Scipolicy*. *The Journal of Science and Health Policy*.  
<http://gort.ucsd.edu/newjour/s/msg02690.html> (accessed 5/2/6)

<sup>83</sup> Foundation for Thought and Ethics. <http://www.fteonline.com/about/html> (accessed 5/9/06)

## Questions Considered during Trial

### 1 ) Does teaching ID violate Establishment Clause of the First Amendment of US constitution?

The Dover (PA) School Board’s ID policy violates the Establishment Clause of the First Amendment of the US Constitution and the Pennsylvania Constitution. “For the reasons that follow, we hold that the ID Policy is unconstitutional pursuant to the Establishment Clause of the First Amendment of the United States Constitution and Art. I & 3 of the Pennsylvania Constitution”.<sup>84</sup> “[I]t is unconstitutional to teach Intelligent Design (ID) as an alternative to evolution in a public school science classroom”.<sup>85</sup> “The proper application of both the endorsement and Lemon tests to the facts of this case makes it abundantly clear that the Board’s ID Policy violates the Establishment Clause. In making this determination, we have addressed the seminal question of whether ID is science. We have concluded that it is not, and moreover that ID cannot uncouple itself from its creationist, and thus religious, antecedents.”<sup>86</sup>

The “endorsement test”, mandated in “establishment” cases, recognizes that when government transgresses the limits of neutrality and acts in ways that show religious favoritism or sponsorship, it violates the Establishment Clause.<sup>87</sup>

### 2) Is ID science? Is ID the same as Creationism, Creation Science or Scientific Creationism?

After extensive testimony, Judge Jones ruled that ID is not science, but religion.

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<sup>84</sup> *Kitzmiller et al. v. DSB* p 3, 139.

<sup>85</sup> *Kitzmiller et al. v. DSB* p 137

<sup>86</sup> *Kitzmiller et al. v. DSB* p 136

<sup>87</sup> *Kitzmiller et al. v. DSB* p 14



“After a searching review of the record and applicable caselaw, we find that while ID arguments may be true, a proposition on which the Court takes no position, ID is not science.”

<sup>88</sup>Supernatural explanations cannot be proved or disproved by scientific methods because they are untestable. ID cannot qualify as science, <sup>89</sup>because it “cannot uncouple itself from its creationist, and thus religious, antecedents” <sup>90</sup>and “is grounded in theology, not science”. <sup>91</sup>The only real effect of the ID Policy is the advancement of religion. <sup>92</sup>

Judge Jones suggested that ID was appropriate for social studies, religion and philosophy classes, but not for science class. Science classes should present material generally accepted by the majority of scientists and which has been subjected to the scientific method.

In the 1987 Edwards decision (Table 2), the US Supreme Court held that the state violated the Establishment Clause by “restructur[ing] the science curriculum to conform with a particular religious viewpoint.”<sup>93</sup> In reference to ID, Judge Jones ruled that “ID aspires to change the ground rules of science to make room for religion, specifically, beliefs consonant with a particular version of Christianity.” <sup>94</sup>

The Court showed that ID is really warmed over creationism. For example, in a more recent printing *Of Pandas and People* (2004) the term “intelligent design” is substituted consistently for “creationism” in a previous edition. <sup>95</sup>

The defendants proposed that ID is science and presented several scientists who wished to redefine science to include supernatural. An intelligent designer works outside laws of nature and science. According to *Of Pandas and People* (2004) “what kind of intelligent agent was it

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<sup>88</sup> Kitzmiller *et al.* v. DSB p 64

<sup>89</sup> Kitzmiller *et al.* v. DSB p 136

<sup>90</sup> *ibid.*

<sup>91</sup> Kitzmiller *et al.* v. DSB p 89

<sup>92</sup> Kitzmiller *et al.* v. DSB p 134

<sup>93</sup> Kitzmiller *et al.* v. DSB p 22-23.

<sup>94</sup> Kitzmiller *et al.* v. DSB p 29.

<sup>95</sup> Kitzmiller *et al.* v. DSB p 32.

(designer) ?” “On its own science cannot answer this question. It must leave it to religion and philosophy”.<sup>96</sup>

Judge Jones ruled that ID is not science<sup>97</sup> because: (1) ID violates the centuries-old ground rules of science by invoking and permitting supernatural causation; (2) the argument of irreducible complexity, central to ID, employs the same flawed and illogical contrived dualism that doomed creation science in the 1980's; and (3) ID's negative attacks on evolution have been refuted by the scientific community.<sup>98</sup> Science does not consider issues of “meaning” and “purpose” in the world, ID does.<sup>99</sup> “It is notable that defense experts’ own mission, which mirrors that of the IDM [Intelligent Design Movement] itself, is to change the ground rules of science to allow supernatural causation of the natural world, which the Supreme Court in *Edwards* and the court in *McLean* correctly recognized as an inherently religious concept.”<sup>100</sup>

### **Who/What is the intelligent designer?**

Rev. Haught testified at the trial that anyone familiar with Western religious thought would make the association that the designer is God. According to *Pandas* the intelligent designer works outside laws of nature. In “*Of Pandas and People*” the designer is called a “master intellect”, strongly suggesting a supernatural deity. Many ID proponents think the designer is God, no serious alternative to God is proposed.<sup>101</sup>

### **3) What is evolution?**

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<sup>96</sup> Davis, P. and D, Kenyon. 1993. (5<sup>th</sup> printing 2004). *Of Pandas and People*.

<sup>97</sup> *Kitzmiller et al. v. DSB* p 64.

<sup>98</sup> *ibid.*

<sup>99</sup> *Kitzmiller et al. v. DSB* p 65

<sup>100</sup> *Kitzmiller et al. v. DSB* p 67.

<sup>101</sup> *Kitzmiller et al. v. DSB* p 34.

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The theory of evolution is overwhelmingly accepted by the scientific community and in no way conflicts with the existence of a divine creator.<sup>102</sup> “To be sure, Darwin’s theory of evolution is imperfect....However, the fact that a scientific theory cannot yet render an explanation on every point should not be used as a pretext to thrust an untestable alternative hypothesis grounded in religion into the science classroom or to misrepresent well-established scientific propositions... Even though theory cannot yet provide explanation for every natural phenomenon, an alternative untestable hypothesis (ID) grounded in religion should not be presented in science class”.<sup>103</sup>

Prior to the release of the proposed disclaimer, the Dover School Board contacted no scientific organizations, only two groups with religious missions.<sup>104</sup> There is a large amount of information on evolution available from scientific societies.

#### **4) Did the government (school board) endorse Christianity by its actions?**

“A reasonable observer is presumed to know the social meaning of the theory-not-fact deliberate word choice and would perceive the School Board to be aligning itself with proponents of religious theories of origin, thus communicat[ing] to those who endorse evolution that they are political outsiders, while . . . communicat[ing] to the Christian fundamentalists and creationists who pushed for a disclaimer that they are political insiders.”<sup>105</sup>

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<sup>102</sup> Kitzmiller *et al.* v. DSB p 136.

<sup>103</sup> Kitzmiller *et al.* v. DSB pp 136-137.

<sup>104</sup> Kitzmiller *et al.* v. DSB p 131.

<sup>105</sup> Kitzmiller *et al.* v. DSB pp 56 –57.

**5) What message did the School Board intend to communicate – to students, to parents and to the general public? Did the ID policy and disclaimer convey a message of endorsement or disapproval of religion to a reasonable objective observer?**

. The Court had to decide if the proposed disclaimer appeared to endorse or disapprove of religion when considered by a reasonable, objective observer.<sup>106</sup> The Defendant’s conduct must be judged from the standpoint of reasonable objective observer.<sup>107</sup> In answer to this question, Judge Jones stated “A[a]n objective observer would know that ID and teaching about “gaps” and “problems” in evolutionary theory are Creationist, religious strategies that evolved from earlier forms of Creationism”.<sup>108</sup>

**6) Would a student of a relevant age perceive the disclaimer as official school support of religious activity?**<sup>109</sup>

Judge Jones noted that “students are more impressionable than adults, they may be systematically less effective than adults at recognizing when religious conduct is unofficial and therefore permissible.”<sup>110</sup> When the disclaimer was read to a ninth grade biology class, would an objective student view the disclaimer as an official endorsement of religion?<sup>111</sup> “[W]e find that an objective student would view the disclaimer as a strong official endorsement of religion.”<sup>112</sup>

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<sup>106</sup> *Kitzmiller et al. v. DSB* p 17.

<sup>107</sup> *Kitzmiller et al. v. DSB* p 50.

<sup>108</sup> *Kitzmiller et al. v. DSB* p 18.

<sup>109</sup> *Kitzmiller et al. v. DSB* p 36.

<sup>110</sup> *Kitzmiller et al. v. DSB* p 37.

<sup>111</sup> *Kitzmiller et al. v. DSB* p 35.

<sup>112</sup> *Kitzmiller et al. v. DSB* p.38.

“We have now found that both an objective student and an objective adult member of the Dover community would perceive Defendants’ conduct to be a strong endorsement of religion pursuant to the endorsement test.”<sup>113</sup>

**7) Does the text, *Of Pandas and People*, proposed by the school board, have a religious message?**

The text is published by the Christian organization , Foundation for Thought and Ethics.<sup>114</sup> In early preEdwards (before 1987) drafts of *Pandas*, the term “creation” was defined as “various forms of life that began abruptly through an intelligent agency with their distinctive features intact – fish with fins and scales, birds with feathers, beaks, and wings, etc,” the very same way in which ID is defined in the subsequent published versions.<sup>115</sup>

The proposed biology book, *Pandas*, supports the proposition that “ID requires supernatural creation .... To which students in Dover’s ninth grade biology class are directed. *Pandas* indicates that there are two kinds of causes, natural and intelligent, which demonstrate that intelligent causes are beyond nature.” “T[t]he objective observer, whether adult or child, would conclude from the fact that *Pandas* posits a master intellect that the intelligent designer is God.”<sup>116</sup> For all these reasons, “A reasonable observer ..... would perceive the School Board to be aligning itself with proponents of religious theories of origin,” thus “communicat[ing] to those who endorse evolution that they are political outsiders, while . . . communicat[ing] to the

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<sup>113</sup> Kitzmiller *et al.* v. DSB p 63.

<sup>114</sup> Foundation for Thought and Ethics.

<sup>115</sup> Kitzmiller *et al.* v. DSB p 56.

<sup>116</sup> Kitzmiller *et al.* v. DSB p 33.

Christian fundamentalists and creationists who pushed for a disclaimer that they are political insiders.”<sup>117</sup>

## **8) What is science?**

The National Academy of Sciences: “Science is a particular way of knowing about the world. In science, explanations are restricted to those that can be inferred from the confirmable data – the results obtained through observations and experiments that can be substantiated by other scientists.”<sup>118</sup>

Science is limited to natural explanations about natural world, using the Scientific Method and does not consider meaning, purpose or supernatural explanations. The method includes a series of steps for answering questions. First an hypothesis, an educated guess about observed phenomena and its possible causes, is proposed, then a tentative explanation. The hypothesis must be testable. Next there is accurate and extensive testing of hypothesis, including controls. Based on the test results, and statistics, the hypothesis is either accepted, revised or rejected. The experiments may then be tested by other scientists, using the same methods. When a large number of scientists accept the hypothesis, it becomes a scientific theory.

Science is progressive, ever changing as new hypotheses are proposed. Science is based on statistics and probability – *e.g.* is the hypothesis supported in 95% of experimental results? The measure of the scientific worth of an hypothesis is its testability and repeatability by other scientists.

## **9) What is Religion?**

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<sup>117</sup> Kitzmiller *et al.* v. DSB p 57.

<sup>118</sup> Kitzmiller *et al.* v. DSB p 66.

Religion is defined as “recognition of and belief in a super human power or powers”.<sup>119</sup> It cannot be tested scientifically, because science can only test natural observable phenomena amenable to scientific testing methods.

### **The “Lemon Test”**

As mandated by the justice system, Judge Jones used various tests (Lemon test, various legal precedents, two previous US Supreme Court rulings stating Creationism should not be taught as science – Table 2) when ruling on issues of the violation of the “Establishment Clause”. A 1971 Supreme Court Decision, *Lemon v Kurtzman*, proposed a three part test to determine if a government action violated the “Establishment” Clause of the First Constitutional Amendment. The “Lemon Test” states that the action in question must 1) have a *bona fide* secular purpose; 2) not advance or inhibit religion; and 3) not excessively entangle the government with religion (Table 2).<sup>120</sup> In applying the Lemon test to the challenged action, the Judge said “We find that the secular purposes claimed by the board amount to a pretext for the board’s real purpose, which was to promote religion in the public school classroom.”<sup>121</sup>

### **Climate of the Trial**

During the trial the community was very divided and considerable nasty assertions were made between the evolution supporters and the ID supporters.<sup>122</sup> Evolution supporters were called unChristian, atheists and told they were going to go to hell.<sup>123</sup>

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<sup>119</sup> Barnhart, C. (Editor). 1951. *Thorndike-Barnhart Comprehensive Desk Dictionary*. 1951. Doubleday & Co., NY. p. 656.

<sup>120</sup> Masci, D. 2005. *From Darwin to Dover*.

<sup>121</sup> *Kitzmiller et al. v. DSB* p 132.

<sup>122</sup> *Kitzmiller et al. v. DSB* p 129 – 130

<sup>123</sup> *Kitzmiller et al. v. DSB* p 130.

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Several members of the School Board admitted they know very little about ID and that they did not know if ID was good science or not.<sup>124</sup> Certain defendants from the School Board insisted that the US Constitution did not address the separation of church and state and that it was only a “myth” that such an amendment existed.<sup>125</sup>

The Dover science teachers were in the middle of this controversy. They refused to read the disclaimer, so school administrators had to do it.<sup>126</sup> The teachers were not consulted about the ID policy.<sup>127</sup> The School Board only consulted religious education organizations, no scientific societies.<sup>128</sup>

“Judge Jones also excoriated members of the Dover, PA school board, who he said lied to cover up their religious motives, made a decision of ‘breathtaking inanity’ and ‘dragged’ their community into ‘this legal maelstrom with its resulting utter waste of monetary and personal resources’”.<sup>129</sup>

The School Board ignored their solicitor’s warnings that a suit might ensue if they continued their effort to incorporate the disclaimer into the school curriculum.<sup>130</sup>

### **Judge Jones’ Conclusions**

“The citizens of the Dover area were poorly served by the members of the Board who voted for the ID Policy. It is ironic that several of these individuals, who so staunchly and proudly

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<sup>124</sup> *Kitzmiller et al. v. DSB* p 121-122

<sup>125</sup> *Kitzmiller et al. v. DSB* pp 104 – 105, 118

<sup>126</sup> *Kitzmiller et al. v. DSB* p 127.

<sup>127</sup> *Kitzmiller et al. v. DSB* p 122.

<sup>128</sup> *ibid.*

<sup>129</sup> Goodstein, L.. 2005. “Judge Rejects Teaching Intelligent Design” *New York Times* 12/20/05.

<sup>130</sup> *Kitzmiller et al. v. DSB*. p127



touted their religious convictions in public, would time and again lie to cover their tracks and disguise the real purpose behind the ID Policy.”<sup>131</sup>

The judge also ruled that the Dover School Board could not use the proposed disclaimer.<sup>132</sup> “We will also issue a declaratory judgment that Plaintiffs’ rights under the Constitutions of the United States and the Commonwealth of Pennsylvania have been violated by Defendants’ actions. Defendants’ actions in violation of Plaintiffs’ civil rights as guaranteed to them by the Constitution of the United States and 42 U.S.C. § 1983 subject Defendants to liability with respect to injunctive and declaratory relief, but also for nominal damages and the reasonable value of Plaintiffs’ attorneys’ services and costs incurred in vindicating Plaintiffs’ constitutional rights.”<sup>133</sup>

### **Future Decisions on ID**

Anti-evolution legislation currently is being considered in Alabama, Kansas, Michigan, Missouri, Mississippi, New York, Oklahoma, South Carolina and Utah.<sup>134</sup>

Scientists hope that the Dover decision will reduce the number of challenges to the teaching of evolution in various US states In Kansas the State Board of Education is currently weighing new standards, drafted by ID supporters, that cast doubt on the theory of evolution and encourage teachers to “teach the evidence” for and against evolution. ID supporters have framed the current school board election as a battle between science and religion.<sup>135</sup> As you enter

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<sup>131</sup> Kitzmiller *et al.* v. DSB. p137

<sup>132</sup> Kitzmiller *et al.* v. DSB. p138.

<sup>133</sup> *ibid.*

<sup>134</sup> AAAS Board. 2006.

<sup>135</sup> Bhattacharjee, Y. 2006. “Strategies Evolve as Candidates Prepare for Kansas Board Races.” *Science* 311 (5761): 588-589.

Kansas, a conservative state, from Missouri on a main highway, antievolutionists have posted a billboard stating “Evolution is a Fairy-Tale for Grown-Ups”<sup>136</sup> The evolutionists running for the State Board hope that the Dover decision will strengthen their case. The financial costs (>\$1,000,000<sup>137</sup>) incurred by the Dover School as a result of the decision are a powerful argument for the evolutionists. According to an evolution supporter running for the Kansas State Education Board, “Either we can have a very expensive lawsuit, or we can get it taken care of through the election.”<sup>138</sup>

ID proponents now propose that schools teach “the controversy” concerning evolution. After the Dover decision, the teaching of ID in any form could expose the school boards to expensive lawsuits.<sup>139</sup> Alan Leshner, CEO of AAAS, concludes “These people are well financed and ideologues in the true sense, and they are not giving this [ID] up.”<sup>140</sup>

### **Public Reactions to Dover Decision**

John G. West, senior fellow at the Discovery Institute stated “The Dover decision is an attempt by an activist federal judge to stop the spread of a scientific idea and even to prevent criticism of Darwinian evolution through government-imposed censorship rather than open debate, and it won’t work....He has conflated Discovery Institute’s position with that of the

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<sup>136</sup> *ibid.*

<sup>137</sup> National Center for Science Education. 2006. “Intelligent design cost Dover over \$1,000,000.” (accessed 6/20/06)

[http://www.ncseweb.org/resources/news/2006/PA/162\\_intelligent\\_design-costs-dov\\_2\\_24](http://www.ncseweb.org/resources/news/2006/PA/162_intelligent_design-costs-dov_2_24)

<sup>138</sup> Bhattacharjee, Y. 2006.

<sup>139</sup> Cullotta, E. 2006. “Is ID on the Way Out?”. *Science* 311: 770

<sup>140</sup> *ibid.*

Dover School Board, and he totally misrepresents intelligent design and the motivations of the scientists who research it.”<sup>141</sup>

Michael Behe reacted to decision stating that the Dover decision “does not impact the realities of biology, which are not amenable to adjudication. On December 21, 2005, as before, the cell is run by amazingly complex, functional machinery that in any other context would immediately be recognized as designed. On December 21, 2005, as before, there are no non-design explanations for the molecular machinery of life, only wishful speculations and Just-So stories.”<sup>142</sup>

In *The Lutheran*, a publication of the Evangelical Lutheran Church in America, named the news stories about the merits of evolution versus ID number six among the top twenty religious stories of 2005.<sup>143</sup>

A reporter for *Guardian Unlimited* reports, “A federal judge’s ruling that intelligent design is faith masquerading as science is being viewed by all sides involved with the issue as a setback, though not a fatal blow, for the movement promoting the concept as an alternative to evolution.”

<sup>144</sup>

According to one of the plaintiffs in the Dover case “The ruling against the teaching of ID is a significant blow to Religious Right-led efforts to sneak fundamentalist dogma into public schools under the guise of science. It sets an important precedent blocking the Religious Right’s crusade to force a particular form of religion into the science curriculum.”<sup>145</sup>

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<sup>141</sup> Discovery Institute, Discovery Institute Staff, “Dover Intelligent Design Decision Criticized as a Futile Attempt to Censor Science Education”. Discovery Institute News, Seattle, WA 12/20/05. <http://www.discovery.org/csc> (accessed 5/11/06)

<sup>142</sup> Behe, M. 2006. “Whether Intelligent Design is Science” Discovery institute Feb 3. 1 page <http://www.discovery.org/scripts/viewDB/index.php?command=view&id=3218> (accessed 5/11/06)

<sup>143</sup> Hunter, Elizabeth. 2005. *The Lutheran* 12/21 “Top Religious Stories of 2005.”

<sup>144</sup> Bates, S. 2006. “Archbishop: stop teaching creationism”. *Guardian Unlimited*. 3/21/06.

<sup>145</sup> Americans United for Separation of Church and State (AU)

In November 2005, prior to Judge Jones' decision, eight Dover School Board members who favored the ID policy were voted out of office. The new Board members were opposed to the ID policy.<sup>146</sup>

**Are Science and Religion Compatible? Can you believe in God and evolution?**

Many scientists are persons of faith. Judge Jones stated “Both defendants and many of the leading proponents of ID make a bedrock assumption that is utterly false. Their presupposition is that evolutionary theory is antithetical to a belief in the existence of a supreme being and to religion in general. Repeatedly in this trial, plaintiff’s scientific experts testified that the theory of evolution represents good science, is overwhelmingly accepted by the scientific community, and that it in no way conflicts with, nor does it deny, the existence of a divine creator.”<sup>147</sup>

Rev. Dr. Warren Eshbach, adjunct faculty at the Lutheran Theological Seminary at Gettysburg, PA, stated in a press conference (November 2005) concerning the Dover trial “In terms of religion and science, I believe: 1) that Genesis 1-11 was not written as a scientific text book for the 21st century, but was a faith statement about the beginnings of life; 2) that Christians can believe in evolution, without going against their belief in a Creator God....The scientific theory of evolution and theology of intelligent design do not have to be mutually exclusive. The infinite God encompasses both,”<sup>148</sup>

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<sup>146</sup> Wilgoren, J. 2006. “In Evolution Debate, a Counter Attack. *New York Times*. 1/1/06.

<sup>147</sup> Kitzmiller *et al.* v. DSB. p136.

<sup>148</sup> Eshbach, W. 2005. Statement re: Dover Area School District.  
<http://www.gettysburgsem.org/studies/id/hbrg-statement.htm>. (accessed 4/20/06)

The Archbishop of Canterbury, Rowan Williams, said he does not believe creationism should be taught in schools. “My worry is creationism can end up reducing the doctrine of creation rather than enhancing it,”<sup>149</sup>

In the US many clergy say that the controversy over ID is not science versus religion (though ID proponents may present it that way) and that there is no conflict between religion and evolution science. “On 12 February 2006, hundreds (320) of Christian churches from all portions of the country (48 states) and a host of denominations will come together to discuss the compatibility of religion and science. For far too long, strident voices, in the name of Christianity, have been claiming that people must choose between religion and modern science. More than 10,000 Christian clergy have already signed ‘The Clergy Letter’ demonstrating that this is a false dichotomy. Now on the 197<sup>th</sup> anniversary of the birth of Charles Darwin, many of these leaders will bring this message to their congregations through sermons and/or discussion groups. Together, participating religious leaders will be making the statement that religion and science are not adversaries. And, together, they will be elevating the quality of the national debate on this topic.”<sup>150</sup>

Pope Benedict XVI declared that the universe is an “intelligent project”.<sup>151</sup> However, a professor of evolutionary biology, Fioerenzo Facchini, quoted in the official Vatican newspaper *L'Osservatore Romano* (1/16 - 17/06), labeled as “correct” this decision in Pennsylvania that intelligent design should not be taught as science and called intelligent design unscientific.<sup>152</sup>

Charles Krauthammer of the *Washington Post* commented, “How ridiculous to make

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<sup>149</sup> Bates, S. 2006. *Guardian Unlimited*.

<sup>150</sup> Clergy letter project [http://www.uwosh.edu/colleges/cols/clergy\\_project.htm](http://www.uwosh.edu/colleges/cols/clergy_project.htm)  
(accessed 5/8/06)

<sup>151</sup> Fisher, I, and C. Dean. 2006. “In ‘Design’ vs. Darwinism, Darwin Wins Points.” *New York Times* 1/19/06.

<sup>152</sup> *ibid*

evolution the enemy of God. What could be more elegant, more simple, more brilliant, more economical, more creative, indeed more divine than a planet with millions of life forms, distinct and yet interactive, all ultimately derived from accumulated variations in a single double-stranded molecule, pliable and fecund enough to give us mollusks and mice, Newton and Einstein? Even if it did give us the Kansas state Board of Education too ” <sup>153</sup>

Rachel Carson, author of *Silent Spring* and *The Sea Around Us*, spoke out on evolution and faith. “It is true that I accept the theory of evolution as the most logical one that has ever been put forward to explain the development of living creatures on this earth. As far as I am concerned, however, there is absolutely no conflict between a belief in evolution and a belief in God as the creator. Believing as I do in evolution, I merely believe that it is the method by which God created and is still creating life on earth. And it is a method so marvelously conceived that to study it in detail is to increase – and certainly never to diminish – one’s reverence and awe both for the Creator and the process.” <sup>154</sup>

### **Conclusions and Summary**

“Defendants’ ID Policy violates the Establishment Clause of the First Amendment of the Constitution of the United States and Art. I, § 3 of the Constitution of the Commonwealth of Pennsylvania.”<sup>155</sup> The Board’s ID policy was “imprudent and ultimately unconstitutional... The breathtaking inanity of the Board’s decision is evident when considered against the factual backdrop which has now been fully revealed through this trial. The students, parents, and teachers of the Dover Area School District deserved better than to be dragged into this legal maelstrom, with its resulting utter waste of monetary and personal resources.” <sup>156</sup>

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<sup>153</sup> Krauthammer, Charles. “Pondering Intelligent Design”. *Washington Post*. 11/28/05.

<sup>154</sup> Lear, Linda. 1997. *Rachel Carson: Witness for Nature*. Henry Holt and Co. Inc., New York. p 227.

<sup>155</sup> Kitzmiller *et al.* v. DSB p 139.

<sup>156</sup> . Kitzmiller *et al.* v. DSB p 138

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The problem in the US with the upsurge of attempts to curtail the teaching of evolution appears to be the increasing influence of the religious right and the inadequacy of science teaching, especially concerning evolution. The misunderstanding of evolution by the American public is a serious concern that should be rapidly addressed by the education community. Why is scientific illiteracy so prevalent in US? There appears to be a suspicion of scientists and science. Political agendas appear to exert more influence than science.

The Court showed that ID is not science, but religion. Once this was demonstrated, religion (ID) did not belong in science classes because students and adults would perceive it as an endorsement of a form of religion. ID, however, is an appropriate subject for social studies, philosophy or religion classes.

The expert witnesses were all outstanding in their fields and presented extremely thoughtful, clear and eloquent testimonies. This case will be studied extensively and has been labeled by some as “The 21<sup>st</sup> Century Scopes Trial”.

Judge Jones made a very brave decision in this case, but it was based on two previous Supreme Court cases and several district court cases. The judge has discussed his role in this case only from the point of the independence of the judiciary. He said his own personal views could not enter into his decision. He was legally bound to abide by the legal precedents and the Court’s research into previous cases was extensive. This decision only applies to central Pennsylvania, but most persons involved with the issue think that the decision will impact all US school districts considering any type of ID policy.

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