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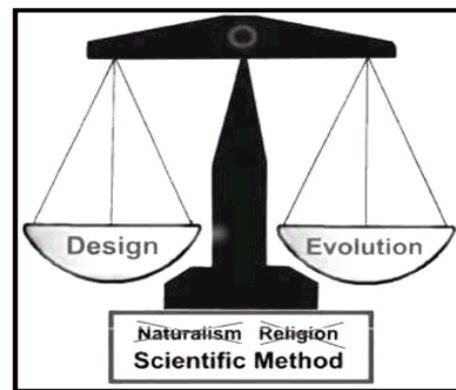
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## TEN REASONS WHY “EVOLUTION ONLY” IS LOGICALLY, SCIENTIFICALLY AND LEGALLY CONTROVERSIAL

This discussion of origins science deals only with biological origins - the science which seeks to explain the origin of life and the origin of the diversity of life - WHERE DO WE COME FROM? This subject is covered in most 9th and 10th grade biology textbooks.

The following list of *Ten Reasons Origins Science is so Controversial* explains why objectivity is necessary in origins science.

“Objective” means “not influenced by personal feelings, interpretations, or **prejudice; based on facts; unbiased: an objective opinion.**” The Supreme Court has held that to qualify as scientific knowledge “an inference or assertion must be derived per the scientific method..” Objectivity is a concept fundamental to the scientific method. Not only does it lead to good science, but it also promotes concepts of religious neutrality and academic freedom mandated by the establishment and speech clauses of the U.S. Constitution. The images of an umpire and a set of scales reflect the idea. Lets do origins science - a very subjective historical science that unavoidably impacts religion - *Objectively, per the scientific method, and without, naturalistic, philosophic or religious bias or assumption.*



Objective Origins Science

**TEN REASONS  
WHY ORIGINS SCIENCE IS CONTROVERSIAL  
and  
WHY IT SHOULD BE CONDUCTED AND TAUGHT OBJECTIVELY**

1. **It appears that science and the State are taking sides against theism in a subject that unavoidably impacts religion. Any answer to the question which the State chooses to ask - "WHERE DO WE COME FROM?" - either positively or negatively impacts religious belief. An answer that natural processes alone are sufficient to explain our origins supports agnosticism, atheism and secular humanism ("nonreligion").<sup>1</sup> An answer that life may be the product of an intelligent cause supports theistic religions. Ray Vasvari, the Legal Director of the ACLU of Ohio acknowledged this effect when he said: "Where did we come from? is fundamentally much more a theological than it is a scientific question."<sup>2</sup> As discussed below, a little known rule<sup>3</sup> used by prominent science associations and most science educators philosophically suppresses any evidence that supports other than a natural cause for our origins. Many claim that State use of the Rule in teaching children about where they come from amounts to state sponsored indoctrination in Naturalism and state sponsored denigration of most theistic religions. The claim is that the State is improperly taking sides in an inherently religious issue - the State is not being religiously neutral.<sup>4</sup>**
  
2. **Explanations regarding origins are controversial because they consist of subjective "historical narratives" that can not be confirmed by experiment as is the case with experimental sciences like physics and chemistry. According to Dr. Ernst Mayr, "Evolutionary biology, in contrast with physics and chemistry, is a historical science -- the evolutionist attempts to explain events and processes that have already taken place. Laws and experiments are inappropriate techniques for the explication of such events and processes. Instead one constructs a historical narrative, consisting of a tentative reconstruction of the particular scenario that led to the events one is trying to explain."<sup>5</sup> Controversy arises when two different interpretations arise about how "the dots" should be connected - how a "particular scenario" should be "reconstructed" via the use of our minds. More controversy arises when only one explanation is allowed in this very subjective area.**
  
3. **Science organizations that control science education prejudice the answer to the question. They use an assumption (that permits no contradiction) that natural processes are adequate to explain all phenomena and that teleological or design conceptions of nature are invalid. The technical name of the assumption is methodological naturalism.<sup>6</sup> Use of this assumption in origins science is extremely controversial because it causes the question - where do we come from? to be answered before it is asked. We come from an unguided natural process - Darwinian evolution.<sup>7</sup>**

Those opposing use of the assumption in origins science claim that:

- a. The assumption is not scientific, rather it is a philosophic construct that is not based on an evidentiary finding.<sup>8</sup> Design is ruled out not because of a lack of evidence, but because of a philosophical decision to not consider it.
  - b. The assumption is inconsistent with evidence collected per the scientific method that the biological information processing systems and networks of life may be the product of intelligence.<sup>9</sup>
  - c. A naturalistic assumption that prejudges the answer to the question - where do we come from? - is inconsistent with logic and good science.<sup>10</sup>
  - d. The assumption is inconsistent with the testing requirements of the scientific method.<sup>11</sup>
  - e. Use of the assumption by the state dictates that the state take sides - the side of a naturalistic explanation in a subject that admittedly impacts religion. The assumption censors evidence because the implications of the evidence supports theistic religion. This is claimed to violate the obligation of the state to remain neutral regarding practices that “touch” religion<sup>12</sup>
4. It is claimed that students are misled because textbooks generally do not disclose the use or the effects of the use of the naturalistic assumption. For example, *Biology the Dynamics of Life*, (Glencoe-McGraw Hill, 2000), a tenth grade biology text that is used extensively throughout the country, does not mention use of the assumption. Instead the book leads one to believe that the theories and explanations discussed in the book are grounded in facts and evidence that have been developed per the scientific method. However, the discussion of the scientific method does not mention the assumption and how the assumption conflicts with various requirements of that method relating to hypothesis generation and testing. This is claimed to be highly misleading. The claim has also been made that a failure of textbooks to disclose use of the assumption has the “effect” of converting the use of methodological naturalism into the promotion of philosophical naturalism.<sup>13</sup> Science educators generally agree that it is inappropriate to use philosophical naturalism in public school science education.<sup>14</sup>
5. Current origins science starts with a controversial assumption that life originates from a purely naturalistic process. The validity of the assumption is questionable because (1) science has not been able to provide a coherent theory as to how life could have arisen from a natural process<sup>15</sup> and (2) because the weight of existing evidence arguably favors an intelligent cause.<sup>16</sup> If an intelligent cause is even a candidate for the origin of the initial “blueprint” of life, then it would seem also to

be a viable candidate for any modifications to the “blueprint” it may have created. This provides natural selection, which is presently claimed to be the sole source of modifications to the blueprint, with an obvious competitor. Accordingly, until science can rule out the competitor on the basis of the evidence, natural selection as an explanation for all of the diversity of life remains nothing more than a very controversial speculation. Using an assumption to eliminate the competition does not cure, but just makes worse, the speculative nature of the theory.

6. Current origins science uses a controversial assumption that all of the diversity of life has resulted from an unbroken chain of gradually accumulated “adaptations” to the descendants of a single common ancestral cell.<sup>17</sup> The validity of the assumption is questionable because of the challenge of irreducible complexity articulated by Michael Behe in *Darwin’s Black Box*. The fossil record also contradicts gradualism as it reflects sharp and sudden bursts of increased complexity as witnessed by the Cambrian explosion<sup>18</sup> and the origin of life itself<sup>19</sup>. The controversy over the fossil record is discussed in great detail in *Icons of Evolution* at pages 29-59 where Darwin’s Tree of Life appears more like a thicket than a tree.<sup>20</sup>
7. An “evolution only” assumption is controversial because it requires us to ignore our minds and intuition that lead us to a contrary design inference. Why must we “assume” that the apparent design we see in nature, and particularly in living systems, is an illusion and not real? This is the \$64,000 question. The work of Dr. Behe and Dr. Dembski that has attracted the interest of a growing number of scientists suggests that our intuition may be correct and that design theory merits continued investigation and discussion. According to Stephen C. Meyer, Ph.D., and Paul Davies, Ph.D., there is no known law which accounts for the sequencing of nucleotide bases along the sugar-phosphate backbones of DNA.<sup>21</sup> Statistical studies suggest that a random arrangement for just one gene is statistically impossible.<sup>22</sup> The issue is controversial because an application of Methodological Naturalism does not even permit a discussion of the evidence, much less any serious investigation of it. Only scientists are qualified to investigate and analyze the evidence of design - it takes biochemists, geologists, biologists, molecular biologists, mathematicians, statisticians, physicists, chemists and information theorists to do the job. If scientists are not allowed to do that job, then it will not get done. Theologians, historians and sociologists are not qualified. The result will be to assign the evidence of design to an intellectual black hole.
8. Much of the evidence that supports Darwinian Evolution is controversial. Perhaps the most articulate statement of the controversial nature of the evidence may be found in *Icons of Evolution: Science or Myth: Why much of what we teach about evolution is wrong*.<sup>23</sup> The book is summarized by Dr. Wells in *Survival of the Fakest* an article originally appearing in the *American Spectator*.<sup>24</sup> *Icons* discusses use of a

discredited experiment to support a naturalistic account for the origin of life - chemical evolution (Chapter 2), a fossil record and evidence of molecular biology that upsets Darwin's Tree of Life (Chapter 3),<sup>25</sup> the circularity of arguments regarding the similarity of vertebrate limbs to support claims of common ancestry (Chapter 4), the use of false pictures showing similar embryonic states to support claims of common ancestry (Haeckel's embryos - Chapter 5), the use "story telling" to support claims of so-called "missing links" in the fossil record (Chapter 6), the use of staged photos of moths resting on tree trunks to demonstrate the efficacy of natural selection when biologists have known since the 1980's that moths don't rest on tree trunks (Chapter 7),<sup>26</sup> difficulties in using micro changes in finch beak size as evidence to support natural explanations for major changes in body plans and developmental systems (Chapter 8), difficulties in using mutant fruit flies whose lethal extra set of wings that do not work as evidence of evolutionary mechanisms (chapter 9), discussing how philosophical assumptions seem to be driving Darwinian explanations rather than the evidence (Chapter 10). Reviews of Icons have failed to find fault with the accuracy of the work. Criticisms primarily argue that the overall effect of the work has been to give a "false impression" of the adequacy of evolutionary theory. In view of the highly speculative nature of this historical science and the protection given to the theory via methodological naturalism, the "false impression" claim, is itself subject to reasonable doubt.

9. Evolutionary theory is controversial because most of the evidence which supports it is also consistent with the design hypothesis. There is hardly any evidence that supports Darwinian theory that is not also consistent with a theory of common design. Increased complexity in the fossil record, similarity of anatomical features and systems, common gene sequences, some similarities in embryonic structures, and so-forth all are consistent with common design - much the way Bill Gates designs new software for a myriad of different information processing applications. Without the naturalistic assumption, much of the evidence for Darwinian evolution becomes neutral at best. Common sense dictates that evidence that is consistent with a competing hypothesis proves neither.
10. Evolutionary theory is controversial because the naturalistic assumption protects it from adequate testing and falsification. As pointed out by Dr. Ernst Mayr and Carol Cleland historical hypotheses can not be tested via experiment.<sup>27</sup> Ernst Mayr also acknowledges that many aspects of evolutionary theory are not falsifiable.<sup>28</sup> Under these circumstances, the only remaining test is one which seeks to rule out competing hypotheses on the basis of the evidence.<sup>29</sup> According to Carol Cleland, the failure to rule out or to seek to rule out a competing historical hypothesis leaves the hypothesis to be tested nothing more than a speculation or a "dreaded just-so story."<sup>30</sup> "A theory may be falsified ....by demonstrating ..that the assumptions underlying the theory are unfounded or false."<sup>31</sup> However, the irrebuttable assumption of Methodological Naturalism does not permit one to show the

**assumption to be false or unfounded.<sup>32</sup> Regardless of its utility in some scientific disciplines, the irrebuttable nature of the assumption leaves the historical evolutionary hypothesis untested and nothing more than a speculation - a “dreaded just-so story.”**

## NOTES

1. “First, Darwinism rejects **all** supernatural phenomena and causations.” [Ernst Mayr, “*Darwin’s Influence on Modern Thought*,” p. 81-83, (July 2000, Scientific American). “Darwin made it possible to be an intellectually fulfilled atheist.” Richard Dawkins, *The Blind Watchmaker* (New York: W. W. Norton, 1986, p. 6); “Man is the result of a purposeless and natural process that did not have him in mind.” George Gaylord Simpson, *The Meaning of Evolution, Revised Edition* (New Haven, CT: Yale University Press, 1967, p. 345): “The scientific community has a better chance of keeping religious beliefs out of its structure if it concedes that science is fundamentally materialistic and atheistic in its outlook.” [Mano Singham, Ph.D., *Are Scientists Materialists*, Submitted to Physics Today, (12-4-01)].
2. *Transcript of a dialogue between John H. Calvert, J.D., Managing Director of Intelligent Design network, inc. and Ray Vasvari, Legal Director of the ACLU of Ohio, on the Time-Warner Civic Forum of the Air*, p. 5, June 11, 2002. (<http://www.IntelligentDesignnetwork.org/johncalvertvaclutrascript.htm>). “First, cosmology and evolutionary theory ask the ultimate origin questions that have traditionally been the province of religion and theology. Scientism is courageously proffering naturalistic answers that supplant supernaturalistic ones and in the process is providing spiritual sustenance for those whose needs are not being met by these ancient cultural traditions.” [Michael Shermer, *The Shamans of Scientism*, Scientific American, p.35 (June 2002)]
3. “Science, fundamentally, is a game. It is a game with one overriding and defining rule: Rule No. 1: Let us see how far and to what extent we can explain the behavior of the physical and material universe in terms of purely physical and material causes, without invoking the supernatural.” (Richard Dickerson, essay published in *Journal of Molecular Evolution*, 34 at 277 (1992). Although a design inference does not require a “supernatural” agent, the rule is applied without regard to this distinction.
4. Remarks of John H. Calvert, J. D., to the Science Standards Committee of the Ohio State Board of Education, on January 13, 2002 [<http://www.intelligentdesignnetwork.org/ohioboardtalk.htm>].
5. Ernst Mayr, “*Darwin’s Influence on Modern Thought*,” p. 80, (July 2000, Scientific American). Dr. Mayr is described in the biographical sketch that accompanies the article at page 83 as “one of the towering figures in the history of evolutionary biology.”
6. “A central tenet of modern science is methodological naturalism - it seeks to explain the universe **purely** in terms of observed or testable natural mechanisms.” John Rennie, Editor of Scientific American, *15 Answers to Creationist Nonsense*, Scientific American, p. 78 (July 2002). Philosophical Naturalism is “the doctrine that cause-and-effect laws (as of physics and chemistry) are adequate to account for all phenomena and that teleological [design] conceptions of nature are invalid” (*Webster’s Third New International Dictionary of the English Language, Unabridged*, 1993). Methodological Naturalism is an irrebuttable assumption “that cause-and-effect laws (as of physics and chemistry) are adequate to account for all phenomena and that teleological [design] conceptions of nature are invalid.” In practice the two are essentially indistinguishable because the assumption “allows no contradiction” and is not usually disclosed. See letter to the Chairmen of the Science Standards Committee of the Ohio State Board of

Education, dated February 27, 2002 at <http://www.intelligentdesignnetwork.org/letterreHauryremarks.htm>

7. In 1996 the National Association of Biology Teachers published a statement on teaching evolution: "The diversity of life on earth is the outcome of evolution: an unsupervised, impersonal, unpredictable and natural process of temporal descent with genetic modification that is affected by natural selection, chance, historical contingencies and changing environments." Although the statement has since been withdrawn it accurately states the logical consequence of the naturalistic assumption and the result that is achieved with the assumption is actually used and enforced.
8. See Note 3. "Science takes as its starting point the **assumption** that life wasn't made by a god or a supernatural being; it happened unaided and spontaneously, as a natural process." Paul Davies, *The Fifth Miracle: The SEARCH for the ORIGIN and MEANING of Life*, p. 28 (Simon & Schuster, 1999).
9. "Biology is the study of complicated things that give the appearance of having been designed for a purpose." [Richard Dawkins, *The Blind Watchmaker*, p 1 (W.W. Norton & Company 1996). The works of Michael Behe and William Dembski indicate that our intuitive design inferences have a valid scientific basis: Michael Behe, Ph.D., *Darwin's Black Box: The Biochemical Challenge to Evolution* (The Free Press 1996) and William Dembski, Ph.D., *The Design Inference: Eliminating Chance Through Small Probabilities* (Cambridge University Press 1998) and *No Free Lunch: Why Specified Complexity Cannot be Purchased without Intelligence*, (Rowman & Littlefield 2002).
10. The Supreme Court has defined "scientific knowledge" as knowledge derived per the scientific method. *Daubert v. Merrill Dow Corporation, Pharmaceuticals, Inc.*, 509 U.S. 579, 590 (1993). The Court points out that the focus should be "on principles and methodology, not on the conclusions that they generate." Contrary to this focus, Methodological Naturalism dictates the conclusion before the process starts. It interferes with hypothesis generation and hypothesis testing that is required by the method.
11. Historical hypotheses, which are not susceptible to confirmation by experiment (see paragraph 2 and note 5), are tested by seeking to rule out competing hypotheses on the basis of the available evidence - this science seeks to find a "best explanation." [Carol Cleland, *Historical Science, Experimental Science and the Scientific Method*, [Geology, November 2001, Vol 29 No. 11, 987-990]. Methodological naturalism rules out the competing hypothesis by assumption rather than by the evidence. This would appear to leave evolution untested and nothing more than a speculation - a "dreaded just-so story."
12. In *Epperson v. Arkansas*, 393 U.S. 97 (1968), the Supreme Court held that the establishment clause was violated when the state took sides in origins science by censoring evolution - a naturalistic theory of origins. In issuing its opinion the Court noted that: "Government in our democracy, state and nation, must be neutral in matters of religious theory, doctrine, and practice. **It may not be hostile to any religion** or to the advocacy of no-religion; and it may not aid, or foster or promote one religion or religious theory against another or even against the militant opposite. **The First Amendment mandates government neutrality** between religion and religion, and **between religion and nonreligion**. As early as 1872, this Court said: "The law knows no heresy and **is committed to the support of no dogma, the establishment of no sect.**" This suggests that the use of methodological naturalism by the state in discussing an issue that impacts religion would cause the state to "take sides" and not be Constitutionally neutral. For a legal opinion that expresses this view see John Calvert, J.D., and William S. Harris, Ph.D., *Teaching Origins Science in Public Schools: Memorandum and Opinion*, (Intelligent Design network 2001). The opinion may be viewed at <http://www.IntelligentDesignnetwork.org/legalopinion.htm>.
13. Requests that have been made to disclose the assumption have generally been denied [See letter to the Co-Chairmen of the Science Standards Committee of the Ohio State Board of Education, dated February 27, 2002 at <http://www.intelligentdesignnetwork.org/letterreHauryremarks.htm> and the letters to the Kansas

State Board of Education of Intelligent Design network, inc. dated January 5, 2001 and February 8, 2001, at <http://www.intelligentdesignnetwork.org/6thdraftrevisions.htm> and <http://www.intelligentdesignnetwork.org/Feb8letterKSBE.htm>].

14. See the letters referenced in the preceding note.
15. Noam Lahav, "*Biogenesis - Theories of Life's Origins*," at 303 (Oxford University Press, 1999) - developing a theory "seems hopeless." Paul Davies book is a challenge to the scientific community to provide a natural explanation for the origin of life: "Snowflakes contain syntactic information in the specific arrangement of their hexagonal shapes, but these patterns have no semantic content, no meaning for anything beyond the structure itself. By contrast, the distinctive feature of biological information is that it is replete with meaning. DNA stores the instructions needed to build a functioning organism; it is a blueprint or an algorithm for a specified, predetermined product. Snowflakes don't code for or symbolize anything, whereas genes most definitely do. To explain life fully, it is not enough simply to identify a source of free energy, or negative entropy, to provide biological information. We also have to understand how *semantic* information comes into being. **It is the quality, not the mere existence, of information that is the real mystery here.**" [The Fifth Miracle, *supra* at 60]. The foundation for chemical evolutionary theories, the Miller Urey experiment has been discredited but is still being used in textbooks - see Biology the Dynamics of Life, page 390 [Jonathan Wells, Ph.D., *Icons of Evolution: Science or Myth?*, 9-27(Regnery 2000)].
16. It has been hypothesized that the first living organism that would require DNA carrying a "message" consisting of at least 300 genes. Messages, like DNA, have a semantic characteristic that is the hallmark of intelligence. No known law dictates the message carrying sequence of nucleotide bases along the sugar-phosphate backbone of the DNA and the assembly of the sequence of a single gene for the first cell prior to a replicating population would appear statistically impossible (see paragraph 7 and related notes). This appearance of design coupled with the lack of any known natural process guided by a combination of chance and law arguably makes design the best current explanation for the origin of life.
17. The assumption, which is a philosophical assumption, is called the "Principal of Biological Continuity" [Noam Lahav, "*Biogenesis - Theories of Life's Origins*," at 144 (Oxford University Press, 1999)].
18. Jonathan Wells, Ph.D., *Icons of Evolution: Science or Myth?*, 29-59 (Regnery 2000)].
19. The appearance of fossil bacteria very close to the point in time that the earth first became inhabitable suggests a sudden rather than gradual appearance of life. "*Earliest organic evolution. Essay to the memory of Bartholomew Nagy.*" [Precambrian Research, Vol. 106, (1-2), pp. 79-91 (2001)]. "On the basis of such studies, the interaction of microorganisms with the formation of minerals can be traced back to early Archean times, 3800 million years ago. There is no indication supporting the assumption that some kind of prebiotic evolution took place in the recorded history of the Earth. The origin of life is open to alternative explanations, including extraterrestrial phenomena."
20. *Supra*, note 18.
21. Stephen C. Meyer, "*Word Games, DNA, Design & Intelligence*," p. 48 (Touchstone, July/August 1999); Paul Davies, *The Fifth Miracle: The SEARCH for the ORIGIN and MEANING of LIFE*, p. 99 (Simon & Schuster 1999), "Can science ever explain such a magnificently self-orchestrating process?"
22. Consider the DNA sequence for just one gene that codes for a single protein containing 100 amino acids. The probability of the random formation of this sequence has been calculated to be around  $4.9 \times 10^{-191}$ . The September 2002 issue of *Discover* reports that scientists at MIT have calculated that the maximum



- number of events that have occurred in the entire universe since the beginning of time is  $10^{120}$ . This renders the sequencing of one gene a statistical impossibility. It has been estimated that the first organism - the simplest of cellular systems - would have required on the order of 300 genes. [ See Walter L. Bradley and Charles B Thaxton, “*Information and the Origin of Life*” in the “Creation Hypothesis,” p.190, ed. J.P. Moreland (Downers Grove, Il.; InterVarsity Press, 1994)]. A number of similar probability calculations by a number of scientists have been collected by Dean L. Overman in “*A Case Against Accident and Self Organization*” at 58 - 65 (Rowman & Littlefield Publishers, Inc., 1997).
23. *Supra*, Note 18.
  24. Jonathan Wells, *Survival of the Fakest*, (American Spectator, December 2000, January 2001) and may be found at <http://www.discovery.org/articleFiles/PDFs/survivalOfTheFakest.pdf> .
  25. In *New evolution theory is survival by gene sharing*, Ronald Kotulak, a science reporter for the Chicago Tribune (August 12, 2002) reports on the work of Carl Woese, a University of Illinois molecular biologist about how “Life on Earth did not start just once, as biology books have long taught, but possibly millions of times.”
  26. Judith Hooper’s new book *Of Moths and Men: The Moth that Failed*, describes the sad tale. The book is reviewed by Paul Raeburn in the August 25, 2002 issue of the New York Times Book Review section.
  27. See paragraph 2 and Notes 5 & 11.
  28. “Many biologists and philosophers deny the existence of universal laws in biology and suggest that all regularities be stated in probabilistic terms, as nearly all so-called biological laws have exceptions. Philosopher of science Karl Popper’s famous test of falsification therefore can not be applied in these cases.” Ernst Mayr, “*Darwin’s Influence on Modern Thought*,” p. 80-82, (July 2000, Scientific American).
  29. Carol Cleland, *Historical Science, Experimental Science and the Scientific Method*, [Geology, November 2001, Vol 29 No. 11, 987-990.
  30. *Ibid.* at 990. An example of the difficulty would be a murder case where a deceased child is found strangled in a basement of a house occupied only by a mother and father. The competing hypotheses are that the death was caused by (a) the mother, (b) the father or (c) an intruder. Until the prosecutor can find evidence that rules out the father and the intruder he can not prosecute the mother and until he finds evidence that rules out the mother and the intruder he can not prosecute the father. In either case the true cause is speculative. Methodological Naturalism is like a prosecutor who, wishing to prosecute the mother, asks the Judge to instruct the Jury that, not on the basis of the evidence but as a matter of expediency, it can assume that neither the father or an intruder committed the crime. Although the jury would necessarily convict if it followed the Judge’s instructions, the result would not rest on any valid factual foundation and should be reversed on appeal. Hence the use of methodological naturalism in origins science is extremely controversial.
  31. Arvid V. Zuber, J.D., Ph.D., *Daubert & Scientific Methodology - Science Made Easy, Supplement For The Defense*, p 19 (Defense Research Institute, November 1999).
  32. According to Scientific American “‘Creation science’ is a contradiction in terms.” A department established by William Dembski at Baylor University to investigate intelligent causes was shut down because its concept violated “The Rule.” Avoiding even the faintest teleological overtones is one of the “unwritten rules of science” [Robert Wright, *Three Scientists and Their Gods*, at 70-71 (Times Books,

1988); "The important point is that there can be nothing purposive or teleological in evolution; any notion of inherent purpose would make nature less amenable to objective analysis. For a biologist to call another a teleologist is an insult. Even orthogenesis, is disliked. The sole force for change must be adaptation." [Robert Wesson, *Beyond Natural Selection*, 10 (1991)]; "The progress of knowledge rigidly requires that *no non-physical postulate ever be admitted* in connection with the study of physical phenomena. We do not know what is and what is not explicable in physical terms, and the researcher who is seeking explanations must seek physical explanations only.' (emphasis added.)<sup>27</sup>" (Mano Singham, *The Science and Religion Wars* (Phi Delta Kappan, 426- February 2000).