

## Two Views of Intelligent Design

### Intelligent Design Is Creationism in a Cheap Tuxedo

Adrian L. Melott

**M**y deliberately provocative title is borrowed from Leonard Krishtalka, who directs the Natural History Museum at the University of Kansas. Hired-gun “design theorists” in cheap tuxedos have met with some success in getting close to their target: public science education. I hope to convince you that this threat is worth paying attention to. As I write, intelligent design (ID) is a hot issue in the states of Washington and Ohio (see PHYSICS TODAY, May 2002, page 31). Evolutionary biology is ID’s primary target, but geology and physics are within its blast zone.

Creationism evolves. As in biological evolution, old forms persist alongside new. After the Scopes “Monkey Trial” of 1925, creationists tried to get public schools to teach biblical accounts of the origin and diversity of life. Various courts ruled the strategy unconstitutional. Next came the invention of “creation science,” which was intended to bypass constitutional protections. It, too, was recognized by the courts as religion. Despite adverse court rulings, creationists persist in reapplying these old strategies locally. In many places, the pressure keeps public school biology teachers intimidated and evolution quietly minimized.

However, a new strategy, based on so-called ID theory, is now at the cutting edge of creationism. ID is different from its forebears. It does a better job of disguising its sectarian intent. It is well funded and nationally coordinated. To appeal to a wider range of people, biblical literalism, Earth’s age, and other awkward issues are swept under the rug. Indeed, ID obfuscates sufficiently well that some educated people with little background in the relevant science have been taken in by it. Among ID’s diverse adherents are engineers, doctors—and even physicists.

ID advocates can’t accept the inability of science to deal with supernatural hypotheses, and they see this limitation as a sacrilegious denial of God’s work and presence. Des-

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### Philosophy Is Essential to the Intelligent Design Debate

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**P**redictably, the attempts by advocates of intelligent design (ID) to persuade Ohio’s state school board to overrule the state’s science advisory board and insert ID ideas into the Ohio science standards have sparked a controversy. Inevitably, the usual combatants in the science–religion wars have rushed to their respective barricades.<sup>1</sup>

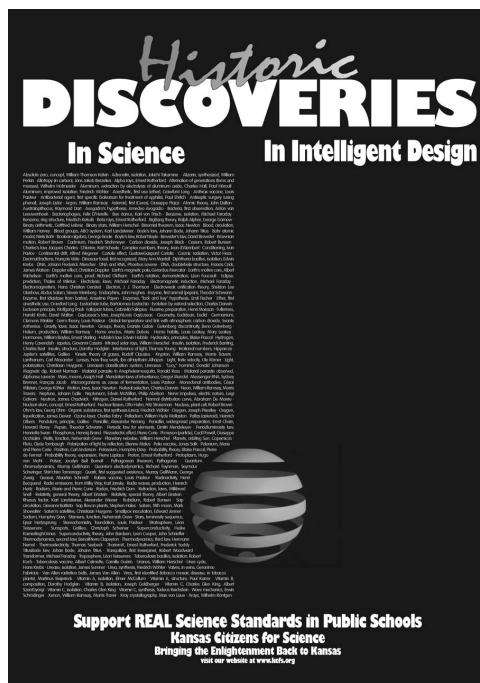
ID advocates argue that scientists are somehow conspiring to suppress ID ideas. They accuse scientists of practicing censorship by arbitrarily excluding ID ideas from journals and science textbooks, thus not giving the ideas a fair chance to gain adherents. To overcome this perceived injustice, ID advocates have appealed directly to political power structures such as school boards and legislative bodies to mandate what should be included in science.

Although such bodies may have the authority to tilt science curricula toward religion, history has not looked kindly on such efforts. The attempts in Louisiana and Arkansas in the 1980s to mandate the teaching of creation science, and the more recent attempt in Kansas to eliminate the teaching of evolution, were debacles for their proponents. They invited dismal comparisons with the Roman Catholic Church’s attempt in 1616 to ban Copernican theory or the Soviet Central Committee’s attempt in 1949 to dismiss Mendeleevian genetics as pseudoscience. One wonders why this dubious strategy is still being pursued.

What is interesting about this battle is that both pro-ID and anti-ID sides casually toss around terms like the “verifiability,” “testability,” and “falsifiability” of theories, as if the meanings of the words were self-evident. Both sides display little awareness that historians and philosophers of science created and have exhaustively studied the terms in the quest to understand the nature of science. These scholars find that all such concepts fail to satisfactorily explain how science progresses.<sup>2–6</sup> The problem of

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perately in need of affirmation, they invent “theistic science” in which the design of the Creator is manifest. Perhaps because their religious faith is rather weak, they need to bolster their beliefs every way they can—including hijacking science to save souls and prove the existence of God.

William Dembski, a mathematician and philosopher at Baylor University and one of ID’s chief advocates, asserts that: “. . . any view of the sciences that leaves Christ out of the picture must be seen as fundamentally deficient.”<sup>1</sup> Whether or not they agree with Dembski on this point, most Americans hold some form of religious belief. Using what they call the Wedge Strategy,<sup>2</sup> ID advocates seek to pry Americans away from “naturalistic science” by forcing them to choose between science and religion. ID advocates know that science will lose. They portray science as we know it as innately antireligious, thereby blurring the distinction between science and how science may be interpreted.

When presenting their views before the public, ID advocates generally disguise their religious intent. In academic venues, they avoid any direct reference to the Designer. They portray ID as merely an exercise in detecting design, citing examples from archaeology, the SETI (search for extraterrestrial intelligence) project, and other enterprises. Cambridge University Press has published one ID book,<sup>3</sup> which, the ID advocates repeatedly proclaim, constitutes evidence that their case has real scientific merit. ID creationist publications are nearly absent from refereed journals, and this state of affairs is presented as evidence of censorship.

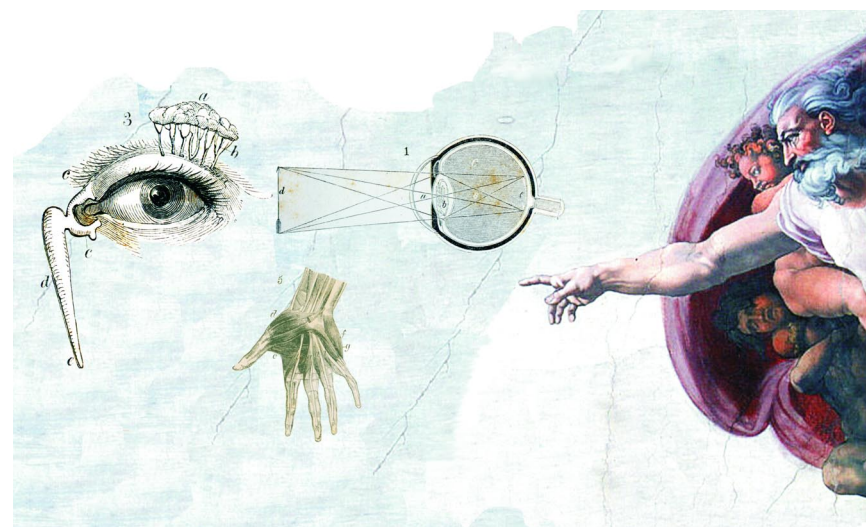
This censorship, ID advocates argue, justifies the exploitation of public schools and the children in them to circumvent established scientific procedures. In tort law, expert scientific testimony must agree with the consensus of experts in a given field. No such limitation exists with respect to public education. ID advocates can snow the public and school boards with pseudoscientific presentations. As represented by ID advocates, biological evolution is a theory in crisis, fraught with numerous plausible-sounding failures, most of which are recycled from overt creationists. It is “only fair,” the ID case continues, to present alternatives so that children can make up their own minds. Yesterday’s alternative was “Flood geology.” Today’s is “design theory.”

Fairness, open discussion, and democracy are core American values and often problematic. Unfortunately, journalists routinely present controversies where none exist, or they present political controversies as scientific controversies. Stories on conflicts gain readers, and advertising follows. This bias toward reporting conflicts, along with journalists’ inability to evaluate scientific content and their unwillingness to do accuracy checks (with notable exceptions), are among the greatest challenges to the broad public understanding of science.

ID creationism is largely content-free rhetoric. Michael Behe, a biochemist at Lehigh University and an ID proponent, argues that many biochemical and biophysical mechanisms are “irreducibly complex.”<sup>4</sup> He means that, if partially dismembered, they would not work, so they could not have evolved. This line of argument ignores the large

number of biological functions that look irreducibly complex, but for which intermediates have been found. One response to Behe’s claims consists of the tedious task of demonstrating functions in a possible evolutionary path to the claimed irreducibly complex state. When presented with these paths, Behe typically ignores them and moves on. I admire the people who are willing to spend the time to put together the detailed refutations.<sup>5</sup>

The position of an ID creationist can be summarized as: “I can’t understand how this complex outcome could have arisen, so it must be a miracle.” In an inversion of the usual procedure in science, the null hypothesis is taken to be the thing Dembski, Behe, and their cohorts want to prove, albeit with considerable window-dressing. Dembski classifies all phenomena as resulting from necessity, chance, or design. In ruling out necessity, he means approximately that one could not predict the detailed structures and information we see in biological systems from the laws of physics. His reference to chance is essentially equivalent to the creationist use of one of the red herrings introduced by Fred Hoyle:



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A junkyard contains all the bits and pieces of a Boeing 747, dismembered and in disarray. A whirlwind happens to blow through the yard. What is the chance that after its passage a fully assembled 747, ready to fly, will be found standing there?<sup>6</sup>

Having dispensed with necessity and chance, Dembski concludes that design has been detected on the grounds that nothing else can explain the phenomenon—at least according to him.

Of course, design has no predictive power. ID is not a scientific theory. If we had previously attributed the unexplainable to design, we would still be using Thor’s hammer to explain thunder. Nor does ID have any technological applications. It can be fun to ask ID advocates about the practical applications of their work. Evolution has numerous practical technological applications, including vaccine development. ID has none.

As organisms evolve, they become more complex, but evolution doesn’t contravene the second law of thermodynamics. Dembski, like his creationist predecessors, misuses thermodynamics. To support the case for ID, he has presented arguments based on a supposed Law of Conservation of Information, an axiomatic law that applies only to closed systems with very restricted assumptions.<sup>7</sup> Organisms, of course, are not closed systems.

ID's reach extends beyond biology to physics and cosmology. One interesting discussion concerns the fundamental constants. There is a well-known point of view that our existence depends on a number of constants lying within a narrow range. As one might expect, the religious community has generally viewed this coincidence as evidence in favor of—or at least as a plausibility argument for—their beliefs. The ID creationist community has adopted the fundamental constants as additional evidence for their Designer of Life—apparently not realizing that many fine-tuning arguments are based on physical constants allowing evolution to proceed. Physical cosmology is largely absent from school science standards. Where present, as in Kansas, it is likely to come under ID attack.

I have only scratched the surface here. Don't assume everything is fine in your school system even if it seems free of conflict. Peace may mean that evolution, the core concept of biology, is minimized. No region of the country is immune. Watch out for the guys in tuxedos—they don't have violins in those cases.

## References

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2. See <http://rnaworld.bio.ukans.edu/id-intro/sect3.html>. Another source is [http://www.sunflower.com/~jkrebs/JCCC/05%20Wedge\\_edited.html](http://www.sunflower.com/~jkrebs/JCCC/05%20Wedge_edited.html)
3. W. Dembski, *The Design Inference: Eliminating Chance through Small Probabilities*, Cambridge U. Press, New York (1998). For a review by W. Elsberry, see <http://inia.cls.org/~welsberry/zgists/wre/papers/dembski7.html>.
4. M. Behe, *Darwin's Black Box: The Biochemical Challenge to Evolution*, Free Press, New York (1996).
5. See <http://www.world-of-dawkins.com/catalano/box/behe.htm>. See also <http://www.cs.colorado.edu/~lindsay/creation/behe.html>
6. F. Hoyle, *The Intelligent Universe*, Holt, Rinehart, and Winston, New York (1983), p. 18.
7. W. Dembski, *No Free Lunch: Why Specified Complexity Cannot Be Purchased without Intelligence*, Rowman & Littlefield, Lanham, Md. (2002).

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how to unambiguously distinguish science from nonscience is an extremely difficult one.<sup>6</sup> It even has a venerable name, “the demarcation problem.” This rich scholarly tradition should play an important role in this discussion, and there is no excuse for ignoring it.

For example, ID advocates claim that “empirical science” consists of those disciplines in which the merits of competing theories can be evaluated by running controlled experiments to “test” them. However, ID advocates also claim that “origins science” (like evolution of life or the cosmos) cannot be investigated empirically because the experiment cannot be run again with controlled initial conditions. Hence they propose, as an alternative methodology for evaluating origins science, that all competing hypotheses be applied to see which one gives the best explanation. They further assert that the only sound hypotheses for the evolution of life are natural selection or ID, and that since natural selection fails in certain situations (referred to as “irreducibly complex” systems<sup>7</sup>), then, by the rules of “falsifiability,”<sup>3,4</sup> ID must be the correct theory.

This argument has four flaws. First, although the tools of analysis may be different for so-called origins science and empirical science (consisting mainly of observations for origins science and experiments for empirical science), the ways in which competing theories are evaluated are

the same for the two cases. Second, it is never the case that only two explanations exist for any scientific phenomenon. Scientists are creative people. They can generate plausible alternative explanations with little effort. Third, ID theory does not satisfy the criteria to be considered part of science. Fourth, “falsifiability” is not the rule by which scientific theories are evaluated.

Although research in the history and philosophy of science convincingly demonstrates that there are no simple and unambiguous methodological rules for deciding which of two (or more) competing theories are better,<sup>2,4,5</sup> theories must meet two criteria if they are to be seriously considered at all. The first criterion is that any scientific theory must be naturalistic. No serious scientific theory in modern times has invoked explanations that appeal to inscrutability or the miraculous. As the paleontologist George Gaylord Simpson put it,

The progress of knowledge rigidly requires that no nonphysical 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.<sup>8</sup>

The second criterion is that the theory must be predictive. No scientific theory is ever just an explication of the currently inexplicable. It must also postulate some mechanism that can be used to predict new phenomena that could not have been conceived under older theories. If a new theory is used to explain result *a* in situation *A*, then that same mechanism must be able to predict result *b* in situation *B*, predict *c* in situation *C*, and so on. This feature of producing new and interesting areas of exploration attracts adherents to a new theory, enabling it to become a serious competitor to the existing dominant theory.<sup>4</sup> It is a theory's predictive aspect that leads to new and important discoveries. These two criteria comprise necessary (but insufficient) conditions for a theory to be considered a part of science. ID fails to satisfy either criterion, and that alone is reason enough for its exclusion.

ID advocates respond that these are philosophical rules, as if that were a disqualification. But just because a rule is philosophical does not mean that it lacks value. In fact, these particular rules have been key to the tremendous advance of science. While scientists may accept that some problems are unsolved—or cannot be solved until new technology or data become available—they never accept that a scientific problem is inherently insoluble. This belief that only their own ingenuity or effort stands between them and success is what makes them persevere for years and leads to great breakthroughs. But when ID is invoked as an explanation for something, its advocates are essentially stating that the problem is inherently insoluble and the solution is inscrutable. Research in that area would presumably come to a halt.

It is absurd for some scientists to defend Darwinian natural selection by saying that there is no feature of life that cannot be explained by it. No scientific theory has ever explained all the phenomena that fall within its domain.<sup>2,4,5</sup> Unexplained problems will always arise that resist solution for a long time. In fact, a good theory is one that keeps generating new problems that scientists can work on and that lead to new discoveries and insights. ID advocates will never run out of cases in which Darwinian natural selection has not yet provided an explanation. But the presence of such anomalies has never been sufficient, by itself, to prompt the scientific community to abandon a dominant theory.<sup>2,4,5</sup>

For example, the motion of the perigee of the moon was

a well-known unsolved problem for over 60 years after the introduction of Newtonian physics.<sup>2</sup> It constituted a serious problem that resisted solution for a longer time than the problems in evolution indicated by ID advocates. Yet no supernatural explanation was invoked. Eventually, the problem was solved, and the result was seen as a triumph for Newtonian theory. Similarly, the stability of the planetary orbits was an unsolved problem for more than 200 years.<sup>5</sup>

These two examples successfully illustrate why simple methodological rules like falsifiability do not explain science's progress. If such a rule were rigorously enforced, then Newtonian physics (and indeed every scientific theory ever proposed) would have been falsified and rejected at birth and we would not have had any science at all. Clearly, scientists make judgments about which theories to keep and which to reject for reasons that are far more complex and subtle than suggested by simple rules like falsifiability.

Scientists consider the merits of competing theories only when science enters a period of crisis—that is, when a dominant theory, despite repeated attempts by its most seasoned practitioners, fails to explain something that should be explainable using existing knowledge, technology, and techniques.<sup>2</sup> The biological science community apparently does not perceive that natural selection is in such a state of crisis. But even if natural selection were in crisis, biologists would not accept ID as a worthy rival. Instead, they would look for alternative naturalistic and predictive theories. If the history of science is any guide, biologists will find and agree on an acceptable theory. That is the way science has evolved.

The last philosophical question about ID involves the role of “truth.” ID advocates argue that it is wrong to keep ID ideas out of science by appealing to naturalistic and predictive rules because the goal of science is to seek “the truth.” How, they ask, will we know if ID is the true explanation for a phenomenon if it is not allowed to compete?

But there is no reason to think that “truth” plays a major role in this discussion.<sup>2</sup> Science constantly produces new theories and discoveries that are powerful, useful, and enlightening. But does that imply we are approaching “the truth”? Alas, no—although many scientists would like to think so.<sup>2,9</sup>

Given the continuing success of science, this limitation is not an easy idea to grasp, especially for scientists. To better understand it, compare the progress of science with that of biological evolution itself. Organisms evolve; new ones emerge from the old, which results in the impressive array of living systems around us that are, for the most part, wonderfully adapted to their present environments. Does this mean that the process of evolution was directed toward a goal? That the present living forms were preordained in the primeval soup? Of course not. The life forms that exist now just happen to be the ones that arose from a vast number of initial possibilities.

Likewise, scientific theories evolve according to how well they answer, at any given time in history, the immediate

## Adrian Melott's Additional ID Resources

- ▷ Fliers suitable for distribution when advocates of intelligent design show up in your area, as well as short essays:  
<http://home.kc.rr.com/bnpndxtr>  
<http://www.sunflower.com/~jkrebs/Resources/Fliers.html>
- ▷ More general information sites related to ID and creationism:  
<http://www.kcfs.org> (Kansas Citizens for Science)  
<http://www.natcensci.org> (National Center for Science Education; numerous links).  
<http://www.talkorigins.org> (for those who want details on science issues)  
<http://astrosun.tn.cornell.edu/students/kornreich/lfg/tactics.html> (common creationist tactics)
- ▷ Publications of value in dealing with ID:  
 R. T. Pennock, *Tower of Babel: The Evidence against the New Creationism*, MIT Press, Cambridge, Mass. (1999).  
 R. T. Pennock, ed. *Intelligent Design Creationism and Its Critics: Philosophical, Theological, and Scientific Perspectives*, MIT Press, Cambridge, Mass. (2001). See also the review of the book by K. Padian in the 29 March 2002 issue of *Science*. An excellent collection of short position statements by ID advocates and critics appears in the April 2002 issue of *Natural History*, which is also available at <http://www.actionbioscience.org/evolution/nhmag.html>.
- ▷ On the relation of religion to some ID issues:  
 K. R. Miller, *Finding Darwin's God: A Scientist's Search for Common Ground between God and Evolution*, Cliff Street Books, New York (1999).  
 R. Dawkins, *Blind Watchmaker*, W. W. Norton, New York (1994).  
 S. Weinberg, *Facing Up: Science and Its Cultural Adversaries*, Harvard U. Press, Cambridge, Mass. (2001).  
<http://www.natcensci.org/article.asp?category=11> (Congregational guide to the PBS TV series *Evolution*)
- ▷ Elementary school enrichment curriculum in evolution and cosmology:  
<http://kusmos.phsx.ukans.edu/~melott/phyed.html>

questions of interest to scientists. As a result, the present impressive array of theories has developed to satisfactorily answer the questions that interest us now. But that does not mean that science is goal-directed and thus progressing toward the “truth.” The present theories were not predetermined to be discovered, any more than the first amphibians that crawled out of the oceans many years ago had the concept of humans encoded for future emergence. Science works—and works exceedingly well—because of its naturalistic approach, predictive nature, and methods of operation. To be valid, science does not have to be true.<sup>9</sup>

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8. G. G. Simpson, *Tempo and Mode in Evolution*, Columbia U. Press, New York (1944), p. 76.
9. M. Singham, *Quest for Truth: Scientific Progress and Religious Beliefs*, Phi Delta Kappa Educational Foundation, Bloomington, Ind. (2000). ■

Letters are encouraged and should be sent to Letters, PHYSICS TODAY, American Center for Physics, One Physics Ellipse, College Park, MD 20740-3842 or by e-mail to [pletter@aip.org](mailto:pletter@aip.org) (using your surname as “Subject”). Please include your affiliation, mailing address, and daytime phone number. We reserve the right to edit letters.