Intelligent Design: A Smart Idea?

Bryan Adams
for HDS1465: The Bible And Politics

January 21, 2005

Abstract

"Intelligent Design" (ID) is the name given to a new school of thought regarding the origin and evolution of life on earth. While it claims no specific spiritual allegiance, it argues that living things are "irreducibly complex" and, therefore, clearly the product of intentional design. As a scientific theory, ID is little more than a rhetorical device; no independent research or evidence are provided. Theologically, ID is problematic in the demands it puts on God. Ultimately, ID is bad theology and worse science.

1 Introduction

In 1802, a theologian named William Paley [10] came to a conclusion that, at the time, seemed obvious: complex, functional things must be designed. He framed his argument in terms of the difference between a stone and a watch.

> Suppose I pitched my foot against a stone and were asked how the stone came to be there, I might possibly answer that for anything I knew to the contrary it had lain there forever; nor would it, perhaps, be very easy to show the absurdity of this answer. But suppose I had found a watch upon the ground, and it should be inquired how the watch happened to be in that place, I should hardly think of the answer which I had before given, that for anything I knew the watch might have always been there. Yet why should not this answer serve for the watch as well as for the stone; why is it not as admissible in the second case as in the first? For this reason, and for no other, namely, that *when we come to inspect the watch, we perceive what we could not discover in the stone; that its several parts are framed and put together for a purpose* ... we think [it] is inevitable, that the watch must have had a maker - that there must have existed, at some time and at some place or other, an artificer or artificers who formed it for the purpose which we find it actually to answer, who completely comprehended its construction and designed its use. (emphasis added)

When he wrote this, Paley lived in a world that seems backwards and primitive by today's standards. Medical knowledge was anchored by a balance of the four "humors," (blood, saliva, urine, and feces), and it was not uncommon for a doctor to treat a headache by drilling a hole in the patient's head. Geology was a new scientific endeavor, and early geologists were just beginning to question the long-held belief that the earth was roughly 6000 years old. The hypothetical watch in his narrative represented the pinnacle of design at the time; the pocket watch had been invented only 24 years earlier. Paley's deduction about an "inevitable maker" were made in a world where complexity was still a dense fog that, over the next 200 years, would start to clear.

And yet, his basic argument - that complex, functional things must be the product of intentional design - has been revived in the last 15 years as a counter to over 150 years of paleological, geological, and biological research. "Intelligent Design" (ID) pitches its foot against the vast array of life on earth and, seeing no definitive explanation from science, declares it to be proof of the existence of a designer. And with a growing army of scientists and lawyers, the ID movement has resurrected Paley's ideas and left many scientists, teachers, and concerned citizens ready to drill holes in their own heads.

This paper seeks to analyze the ID movement from three standpoints. The following section will review the legal environment that gave rise to the ID movement. The third section will briefly summarize the science of evolutionary theory, including an examination of its shortcomings, in order to provide a framework for understanding ID. Section four will examine ID in greater detail, including a review of some of the seminal works, concluding with a discussing of the fatal criticisms. The fifth section with deal with the problem of what theological ground has been sacrificed for this new legal debate, and the final section will conclude that ID is unsatisfactory to both science and theology

2 The Legal Environment

2.1 The Church, the Classroom, and the Courtroom

In the last 100 years, even those with the most literal interpretation of the Bible don't consider it a scientific authority (very few research programs investigate the anthropology of snakes looking for a talking ancestor). But the oldest story - God's creation of Adam and Eve - sparked the most famous conflict between science and religion in the last 100 years: the now-infamous "Scopes Monkey Trial."

John Scopes was a high school science teacher who was prosecuted for violating Tennessee state law by teaching evolution to a high school science class in 1925 [7]. The trial that followed became a national news story; Clarence Darrow and William Jennings Bryan would volunteer to play key roles for the defense and prosecution. The trial itself would turn out to be a microcosm of the larger debate: it generated strong feelings on behalf of all the participants, and yet the outcome decided absolutely nothing. Scopes was found guilty and fined $100, but the fine was later reversed on a technicality. The larger question was left similarly unanswered.

Scopes would be the last legal victory for creationists for some time. Arkansas was one of several states to react to Scopes by passing laws that outlawed teaching evolution in classroom. These laws would remain intact until a 1968 United States Supreme Court ruling *Epperson v. Arkansas* held that the First Amendment to the United States Constitution prohibited states from including the principles of any religious sect or doctrine in their required material.[1] The 9-0 decision was extremely clear; two concurring opinions reiterated the prohibition on teaching creation and explicitly set forth the legality of teaching evolution.

But advocates of creation in the classroom would try a variety of legal challenges over the next thirty years, and various courts found them all invalid. In 1982, *McLean v. Arkansas* held that a "balanced treatment" between creationism and evolution was unconstitutional; any reference to creation was religious in nature.[2] This decision made the case against creationism even more explicit, setting forth five essential characteristics of science:

1. It is guided by natural law;
2. It has to be explanatory by reference to natural law;
3. It is testable against the empirical world;
4. Its conclusions are tentative; i.e., are not necessarily the final word; and

[1] Epperson v. Arkansas (1968) 393 U.S. 97, 37 U.S. Law Week 4017, 89S. Ct. 266, 21 L. Ed 228
[2] McLean v. Arkansas Board of Education (1982) 529 F. Supp. 1255, 50 U.S. Law Week 2412

5. It is falsifiable.

and creation science was found to fail each of these criteria (the McLean test will be re-evaluated in section 3.2).

In 1987, *Edwards v. Aguillard* struck down Louisiana's "Creationism Act," which made teaching evolution conditional on also teaching creationism.[3] Ray Webster, in 1990, brought suit against the New Lenox School District in Illinois, claiming that requiring him to teach evolution abridged his first and fourteenth amendment rights.[4] He was also struck down. Finally, in what appeared to be the final blow to creationism in the classroom, the Ninth Circuit court of appeals rejected the notion that "evolutionism" was its own religion, and should therefore be banned from the class room as well.[5] At this point, the court has fairly completely established the notion that creationism could not be taught in science classrooms. The case was, it seemed, closed.

2.2 A Shift In The Debate

After years of intense legal battle, perhaps it shouldn't be surprising that it was neither scientist nor clergy who would re-ignite this debate. It was a lawyer. Phillip E. Johnson, a graduate of Harvard Law School, clerked for Supreme Court Chief Justice Earl Warren in 1967, the year before the landmark Epperson ruling that prohibited creationism in the classroom. In 1991, he wrote **Darwin On Trial** [6], the book most frequently credited with beginning the ID movement.

Darwin opens with Johnson's reflections on the *Edwards v. Aguillard* decision. In particular, he disagrees with the blanket use of the word "science," repeatedly pointing out that something *scientific* is not necessarily *true*. But his objection to evolution is not just that he feels it contains scientific error, but that the definition of science has precluded any investigation into the very aspect of evolution that, in his opinion, is missing. This missing ingredient, Johnson suggests, is the supernatural. It is important to note that Johnson does not advocate this position as an alternative scientific theory. He freely admits that investigation into Creationism is not science:

> Because creationists cannot perform scientific research to establish the reality of supernatural creation - that being by definition impossible ... the [National Academy of Sciences] has defined "science" in such a way that advocates of supernatural creation may neither argue for their own position nor dispute the claims of the scientific establishment.

In other words, having failed to qualify creationist ideas as science, Johnson proposes, essentially, to change the definition of science to include room for creationist theory.

The first chapter of **Darwin** ends curiously. Johnson, to his credit, admits that he is a philosophical theist and a believer in a God who is capable of acting in the world at any time. He also takes care to distance himself from creationism, saying that he is not interested in addressing "conflicts between the Biblical accounts and the scientific evidence." Instead, he says, he wants to make an argument that the definition of science should be expanded to include supernatural forces.

Unfortunately, Johnson spends the next seven chapters attempting to point out weaknesses in evolutionary theory. He never bothers establishing any credentials in the various sciences he criticizes, and his arguments are generally weak. He reiterates some long-since-debunked creationist nonsense ("natural selection is a

[3] Edwards v. Aguillard 1987, 482, U.S. 578, 55 U.S. Law Week 4860, S. CT. 2573, 96 L. Ed. 2d 510
[4] Webster v. New Lenox School District #122, 917 F. 2d 1004
[5] John E. Peloza v. Capistrano Unified School District, (1994) 917 F. 2d 1004

tautology"), highlights some debates within the scientific community (gaps in the fossil record), and previews some of the ID arguments that are made today (irreducible complexity, for a further explanation, see section 4).

But instead of closing by offering an affirmative case for his expanded definition of science, Johnson ends his book with a lengthy diatribe against the "naturalistic worldview," essentially, the philosophical view that supports the current definition of science. This foreshadows much of the ID movement - negative argument in the place of affirmative evidence - however, it is impossible to deny that Johnson sparked a new discussion of what to teach in science classrooms.

3 An Evolutionary Primer

An adequate understanding of ID theory requires an adequate understanding of evolutionary theory. And any adequate understanding of evolution must begin by clarifying exactly what the word "evolution" means. This paper will borrow two terms frequently used by the ID community, "micro-evolution" and "macro-evolution," to describe two related, but distinct, ideas.

3.1 Micro- and Macro-evolution

Micro-evolution, sometimes referred to as "descent with modification," was laid out in Darwin's seminal **The Origin of Species** [2]. The basic idea is fairly simple. When creatures reproduce, they imperfectly pass along their traits to their offspring. Very occasionally, the "imperfections" change the inherited traits in such a way as to make the offspring more successful in its environment and, therefore, more likely to reproduce. When this happens, the offspring's generation will feature more individuals with these advantageous "imperfections," which can now fairly be called "adaptations."

Perhaps the most impressive aspect of Darwin's theory is that it was formulated in the absence of any concrete knowledge about the mechanism that creatures use to pass traits down through the generations. It would be almost another 100 years before Watson and Crick would demonstrate how deoxyribonucleic acid, or DNA, forms a single molecule that provides exactly the type of inheritance structure theorized by Darwin, right down to the imperfections between generations.

Micro-evolution is nearly universally accepted as a scientific theory. The mechanisms comprised by the theory have been identified and analyzed. Simple examples are observed all the time; antibiotic-resistant strains of bacteria in a petri dish provide a demonstration of the basic mechanism. Computer simulations, using bytes instead of DNA, have reproduced a wide range of evolutionary principles in simulation. Even the staunchest ID defenders concede some limited version of micro-evolution.

Macro-evolution, then, is the theory that "life as we know it" is the result of hundreds of millions of years of micro-evolution. In a sense, "macro-evolution" is a term that is designed to separate out the parts of evolutionary theory that are strongly supported by evidence (those are "micro-evolution") from the parts that are less strongly supported. In particular, objections to macro-evolution take two forms.

The first macro-evolutionary objection concerns the problem of the origin of life. Darwinian evolution describes how a self-reproducing creature changes over time, but it does not describe how a non-self-reproducing system gains the crucial ability to self-reproduce. If it seems unfair to criticize a theory for not explaining something that it doesn't claim to explain, then Darwin should receive additional credit for anticipating these objections. In **Origin**, he openly admits that he does not have conclusive evidence for how life began (and, perhaps surprisingly, gives a nod to the Genesis story).

> I believe that all animals have descended from at most only four or five progenitors, and plants from an equal or lesser number. Analogy would lead me one step further, namely, to the belief that all animals and plants have descended from some one prototype. But analogy may be a deceitful guide. Nevertheless all living things have much in common, in their chemical composition, their germinal vesicles, their cellular structure, and their laws of growth and reproduction ... Therefore I should infer from analogy that probably all the organic beings which have ever lived on this earth will have descended from some one primordial form, into which life was first breathed.

ID's objection to the origin of life issue is well-founded, but irrelevant. It is true that science cannot explain how a Darwinian system might be initiated, and it is further true that many scientists have tried to recreate the conditions that might cause this biological genesis (see [5] for a survey of current research into the origin problem). However, failing to explain the origins of life does not in any way diminish the validity or power of Darwinian evolution. A witness to an auto accident provides valuable information, even if he only saw the car that sped away. This objection is compelling to the ID community, it seems, because their theory *does* explain the origin of life, and, by comparison, evolutionary theory seems incomplete. As a scientific objection, this line of argument is immaterial, and yet rears its head frequently during debates about evolution.

The second macro-evolutionary objection, and the one that ID targets more successfully, concerns the limitations of micro-evolution. Examining the wide spectrum of living creatures, from single-celled organisms through all the various plants and animals including humans, it is difficult to imagine a series of small changes in inherited traits that transforms the single-celled creature into a man. And this difficulty raises a number of important, valid criticisms of evolution.

Many of these objections stem not just from the theological community, but also from the scientific one. Creationist literature frequently paints the scientific community as a homogeneous, unthinking mob of pro-evolutionary zealots. Nothing could be farther from the truth; evolutionary theories are hotly debated among a wide variety of scientists and across a number of disciplines. For example, one long-standing question about evolutionary theory is how creatures might evolve from a single-cell into a multi-cellular body. Although, for some time, the scientific community regarded this problem as a gap in evolutionary theory, the scientific process marched on, and, very recently, Richard Losick, a Harvard biology professor, published a paper that sheds some light on some biochemical processes that could explain how a unicellular creature would turn into a multi-cellular one [9].

Many ID objections to evolutionary theory follow this form: a gap in evolutionary theory is identified and used as evidence that the entire theory is invalid. While some of those gaps may be filled with discovery (as in the case of the unicellular-to-multi-cellular transition), others may be filled with adjustments to evolutionary theory. This is the basic scientific process; theories reflect observation, and when observations fail to match the theory, the theory is adjusted. Many reams could be written dissecting the various ID objections of this kind, and the details of each argument fall outside the scope of this paper. However, this does not imply that all objections to macro-evolutionary theory are invalid. Indeed, at least two are worthy of further examination.

3.2 Fair Criticisms of Macro-evolution

Some seminal macro-evolutionary experiments have problems. Jonathan Wells, an post-doctoral fellow at the Discovery institute with PhDs in both divinity (Yale) and biology (University of California at Berkeley), wrote a book entitled **Icons of Evolution** [12] that recounts problems with ten classic evolutionary experiments. Wells has a credible scientific background and his charges should be taken seriously (see [11] for a thorough response to Wells' book). Some of the charges follow the "macro-evolution is incomplete and therefore invalid" line of argument, including charges two and five which, essentially, indict evolution for gaps in the fossil record. At least one charge is a misunderstanding of the philosophy of science - charge three claims that homology, the study of structural similarity in chordates, is both an outcome and proof

of evolution when, in fact, it is completely independent of evolution. Other charges are just flat-out wrong, such as charge eight, where he asserts that we have not found any genetic mutations that result in an advantageous trait (Pigliucci [11] rightly points out that the genetic factors that underlie melatonin in the skin represent just this kind of genetic modification in response to a sunny climate).

However, some of Wells' charges are about problems with evolutionary experiments, and these carry more weight. In charge four, Wells objects to an illustration of vertebrate embryos by Earnst Haeckel (see Figure 1) that were faked for reasons that are still not clear. He also picks out several problems with Bernard Kettlewell's 1950 "demonstration" of adaptation in peppered moths (the basic assertion was that the pollution from a local factor, which covered the trees with soot, was spurring an evolutionary adaptation where the peppered moth's wings were darker to provide better camouflage from predators). The Kettlewell experiments remain contentious to this day; most scientists seem to agree that there were problems with the experiments, but that the basic findings are still sound. Wells also recounts the "Piltdown man" hoax, where a fake fossil, comprised of both chimpanzee and human bones, was recognized for over 40 years as evidence of an early evolutionary form of man. Although the hoax was eventually exposed (by evolutionary scientists), there is no question that this kind of mistake highlights another problem with evolutionary theory.

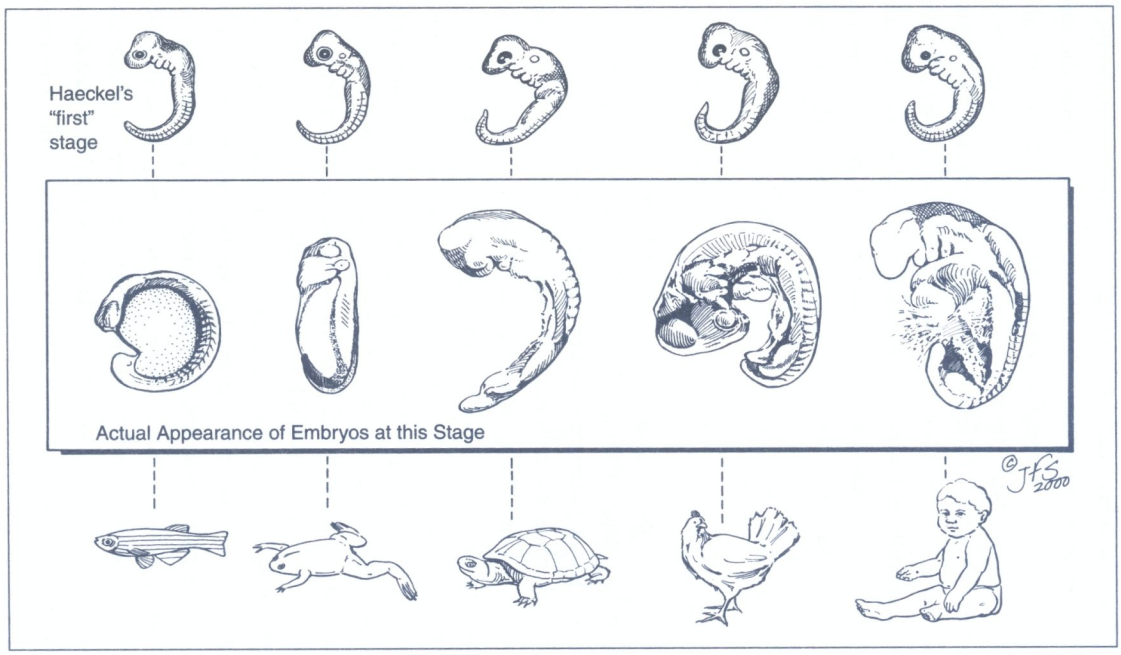

FIGURE 5-2 A Comparison of Haeckel's Drawings with Actual Vertebrate Embryos.

Figure 1: Earnst Haeckel's illustration of vertebrate embryos was fudged, and Wells points this out in his objection to evolutionary theory. (Taken from Wells' book [12].)

Falsification of macro-evolutionary theory is problematic. The 1982 *McLean* decision laid out five criteria for science, and these criteria have become an active battleground in the evolutionary debate. A great deal of objection is raised on both sides about the fourth criterion: conclusions must be tentative. Scientists and creationists hurl similar charges at each other for not being willing, essentially, to consider the opposite viewpoint (and, it must be said, both sides have a point). However, the intransigence of the believers is probably not the most problematic aspect of the *McLean* test.

The fifth criterion, the requirement that a scientific theory be "falsifiable," represents a serious challenge to evolution. Of the five criteria, it is the only one that is entirely concerned with the substance, instead of the context, of the theory. Falsifiability requires a theory to make claims that can be invalidated. The reasoning behind this is clear. If a theory predicts that anything can happen, then it actually predicts

nothing. Freudian analysis is frequently faulted for being unfalsifiable: if a cigar is sometimes just a cigar but other times a phallic replacement, then the entire framework lacks true predictive power. Einstein's theory of special relativity is a classic example of a falsifiable theory. Its predictions about the natural world could be tested and, if they did not accurately reflect the evidence, discarded (although Einstein was famously, posthumously, right).

So the critical question becomes: what piece of evidence would falsify macro-evolution? This question so frequently enrages scientists that it is difficult to find a real answer. The most frequent response is to take a pre-existing piece of evidence, reverse it, and claim that it *would* have falsified evolution had it have turned out that way.[6] In particular, paleontological evidence is susceptible to this problem because it is nearly impossible to turn an absence of evidence into evidence of absence.

The best answer to the falsification of macro-evolution lies in the mechanism: if some aspect of biological inheritance was demonstrated to be incapable of providing a transport for Darwinian evolution, then macro-evolution might be falsified. Darwin identified this method of falsification in **Origin**, "If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down. But I can find out no such case." The ID movement, on the other hand, believes they have found exactly such a case.

4 Intelligent Design

Because ID is presented as a wholesale alternative to evolution, it is generally referred to as a single theory. Careful analysis reveals that ID actually makes two separate assertions, a negative one and a positive one. The negative assertion denies macro-evolution as described in the previous section; it says that Darwinian evolution cannot explain either the origin or complexity of life. The positive assertion is that the shortfalls in macro-evolution are proof of an intelligent designer. These arguments will be considered in turn

4.1 ID's First Argument: Macro-evolution is Insufficient

Many ID arguments take the form of classic anti-evolutionary rhetoric. Wells' book (see section 3.2) is a typical example. By providing only the lowlights, mistakes, inconsistencies, and gaps from the entire course of the history of evolutionary research, Wells hopes to leave the impression that evolution is poorly done and, therefore, wrong. This type of negative argument is easily refuted by considering the entire body of evidence, which overwhelmingly supports evolutionary theories. ID does make some affirmative arguments about evolutionary insufficiency, though, and they generally hinge on complexity.

Irreducible complexity. The irreducible complexity argument is frequently introduced with an analogy to a mousetrap.[7] A mousetrap requires at least five parts: a base, a spring, a hinge, a hammer, and a clasp. Take away any of these elements, the argument goes, and you no longer have a functioning mousetrap. Evolution is incapable of creating something as complex as a mousetrap, the argument goes, because it can only make small changes to already-functional entities. If any of these elements is removed, or if they are introduced one (or even several) at a time, you no longer have a functioning mousetrap. Because evolution can only make small changes, it cannot create something that requires many simultaneous changes.

The biological example for the irreducible complexity argument is the flagellum. Flagella are the small, threadlike structures that some bacteria use for locomotion. Behe leads off his book [1] with an illustration of a flagellum, annotated with mechanical terms (reproduced in Figure 2).

[6] See http://www.iidb.org/vbb/archive/index.php/t-38231.html for a long list of this kind of reasoning.

[7] A contentious reader might object throughout this section to the repeated use of argument by analogy, and that objection is legitimate. However, in order to provide a readable overview of the arguments, these analogies will be allowed to stand.

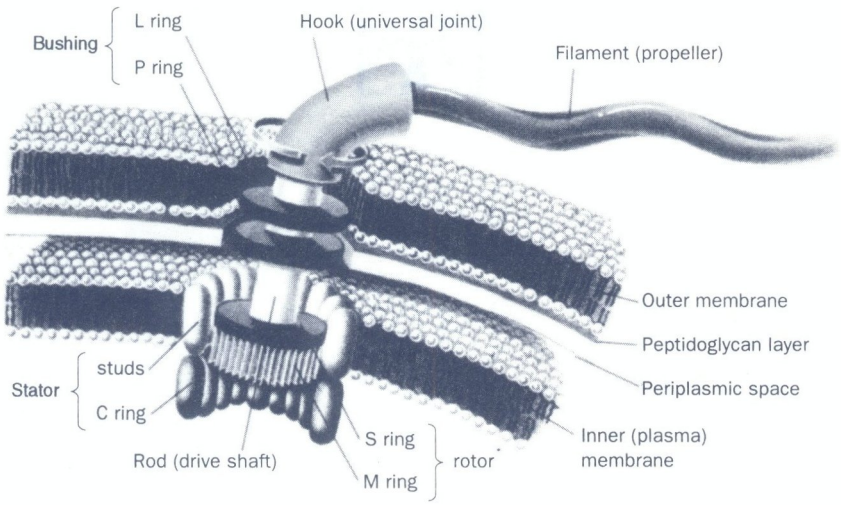

Figure 2: The first page of Michael Behe's **Darwin's Black Box** provides an illustration of a flagellum with mechanical labels.

A flagellum is indeed a complex biological device; it needs to be able to spin freely without leaking the contents of the cell, it needs to receive power from inside the cell without hampering its function, and it needs to be able to control the direction of thrust while performing both of the above tasks. As Figure 2 illustrates, flagella accomplish this task through the use of several complex biomolecules known as proteins.

Proteins are the basic building blocks of all the parts of a cell; everything from the cell wall to the nucleus to the various organelles that perform the basic functions of life are made of proteins. Proteins are specified by a creature's DNA sequence, and the only way to create new proteins is to change the DNA. The only way DNA can change is through the random mutations that are inherent in the reproduction process. Irreducible complexity, then, says that it is impossible for the DNA of a parent without a flagellum to an offspring with a flagellum of this complexity.

This argument is countered in two ways. First, several types of bacteria use flagella that are not as complex as the one Behe cites. So it seems possible that these simpler flagella could be evolutionary precursors to Behe's more complex version. The second counter-argument is most easily made in reference to the mousetrap analogy. While a mousetrap without a spring might not be "functional" in the sense that it catches mice, it may be functional as, say, a paperweight. So although the mousetrap needs all of its parts at once to function as a mousetrap, that does not preclude the idea that the function of a structure might change over the course of the evolutionary history of the part. This theory, sometimes referred to as "neutral evolution," holds that not every mutation has to be advantageous; some mutations might simply change a creature randomly, and the aggregation of these random changes can account for the emergence of greater complexity.

To be fair, both of these counter-arguments are speculative. The true evolutionary history of the flagellum (if, indeed, there is one) is not known. If both arguments are considered objectively, it seems only fair to say that neither evolution nor ID has made an airtight case for their assertion. Evolution might be responsible for the flagellum, but we can't be sure.

Specified complexity. William Dembski, an associate professor at Baylor University, makes a similar argument, but with a more mathematical focus [4]. If we were examining random groups of letters, Dembski

suggests, and we were trying to decipher whether the strings of letters were random or if an intelligent designer had written them, we would need two things. First, we would need the strings of letters to be extremely long, as short strings would not provide enough evidence to differentiate random noise from intelligent design. In other words, the strings need to be reasonably *complex*. Second, the strings would have to conform to some pre-determined set of rules, in this case, the rules of the English language. This means that they have to meet a *specified* criterion. So, if we were getting three-letter strings and happened to get "CAT," that wouldn't be sufficiently complex, and if we were getting very long strings, but they looked like "AODGUGSDKLJERNSDFIUB," then they wouldn't meet specification. But if we got a string that looked like "MYNAMEISBRYANADAMS," then that string is almost certainly the result of intentional design. Dembski goes on to perform all kinds of calculations that demonstrate that the DNA for any living creature meets the specified complexity for intelligent design.

While this argument is more rigorous than the irreducible complexity one, the increased rigor only allows for a clearer counter-argument. First, DNA is an incredibly noisy information source; the majority of any DNA string codes for absolutely nothing whatsoever (these sections of DNA are known as "introns"). The ratio of signal to noise varies from creature to creature, but the human genome is estimated to be about 97% junk and only 3% information (and, curiously, some types of corn have a genome up to ten times longer than the human genome, but (presumably) contain less information). So, to return to the string analogy, the string "MYNAMEISBRYANADAMS" would be legal, but so would "MY?????NAME???????IS..." where the ?'s are replaced with random letters. Put more formally, a more robust "specification" can create much greater latitude for unintelligent design. Functional DNA sequences can also turn into junk (and vice versa), meaning that a small DNA mutation can have absolutely no effect or tremendous effect, depending on what precisely is mutated. To his credit, Dembski anticipates this criticism, and allows that ID could be falsified if "for every instance of biological complexity, some mechanism could readily be produced that accounts for it."[8] While this would certainly do the trick, this information seems rather daunting to gather for every possible creature over the entire history of life.

The second counter-argument implies a much deeper concern. Dembski's analogy only allows for two possibilities: random strings or intelligently designed strings. How he arrived at those two choices is a mystery.

4.2 ID's Second Argument: Lack of Evidence is Proof Of Design

The scientific method is usually summarized by a cycle. One observes the world and makes a hypothesis based on those observations. An experiment is then designed, typically, to falsify that hypothesis. If, for example, you turn the keys in your car and observe that it does not start, you form a hypothesis ("I bet my battery is dead"). You design an experiment to falsify that hypothesis ("I will try to turn the radio on"), run the experiment ("[click, silence]") and then investigate further based on the outcome of that experiment.

If the complexity of life is the non-starting car, then the negative ID assertions (made in section 4.1) are about whether or not the radio came on (the validity of evidence for evolution), thereby affirming or falsifying the hypothesis (evolution). However, even the complete falsification of evolution as a theory would not confirm the validity of ID. Behe, in particular, makes this mistake at the beginning of chapter 9 of **Darwin**. Having dispensed with evolution in 186 pages, he spends four pages dispensing with alternatives to evolution - complexity theory and symbiosis theory - before introducing an analogy where "a body lies crushed, flat as a pancake" while scientists in the next room are climbing all over an elephant in an effort to find the culprit. His on-the-nose analogy aside, Behe feels so strongly that design is responsible for life that he evidently doesn't feel the need to justify his theory as opposed to any other. He, like the rest of the ID community, fails to offer evidence or even a research proposal to validate his hypothesis.

Put another way: if ID's hypothesis is that an intelligent designer exerted a force on living creatures, then

[8] This quote is from a speech Dembski gave at the American Museum of Natural History in April of 2002. A transcript is available at http://www.discovery.org/scripts/viewDB/index.php?programs=CRSC&command=view&id=1154

an experiment must be created to test that hypothesis. In our above analogy, if the car won't start, you hypothesize that the battery is dead, turn on the radio and hear music, but all that you know is that the battery is not dead. You cannot, for example, say, "if the battery is dead, then it must be the timing belt," you must go ahead and design an experiment that will test the timing belt. There might be a number of ways of doing this. ID advocates might carefully track the genetic mutations of a quickly reproducing bacterium over many generations looking for evidence of intelligent modification of the inherited traits. Or they might write a simulation of an evolutionary system that creates an environment where an intelligent designer might act. Or they might comb the wild looking for creatures that are being manipulated by the intelligent designer today.

Of course, no one in the ID community has proposed anything like this, and no one has provided any specifics about the nature of the actions that the intelligent designer takes. It's not clear, for example, if these interactions were a limited, historical set or if they are ongoing today. It's not clear if the actions happen during reproduction or over the course of a creature's life. It's not clear what limitations, if any, bound the designer's power, or why he would choose to do his work in secret. Indeed, this kind of investigation suggests that ID theory, if taken seriously, is simply begging the question: if there is an intelligent designer, what are its origins, and how did it get to be so intelligent?

But the ID community's designer is clearly modeled on a more supernatural force. And perhaps a better understanding of that force is found not in experiments, but in the Bible.

5 ID and the Bible

Although every ID writing is very careful to avoid mentioning any specific religious information as an underpinning, there is no question that it has roots in religious thinking. Johnson, who calls himself a "philosophical theist," has had all of his books published by InterVarsity Press, a publishing house that focuses on Bibles, Bible-related materials, and other Christian publications. Jonathan Wells publicly admits that he has devoted his life to "destroying Darwinism," in part, because of the words of the Reverend Sun Myung Moon.[9] And Johnson, Wells, Michael Behe, William Dembski are all members of the Center for the Renewal of Science and Culture, which is a program within the Discovery Institute, a conservative think tank that, on its website, proudly announces "supporting religious liberty and the legitimate role of faith-based institutions." Moreover, there are serious questions about "the wedge strategy," a memo that was allegedly leaked from the CRSC, that begins with, "The proposition that human beings are created in the image of God is one of the bedrock principles on which Western civilization was built."[10]

Although it would be unfair to disqualify ID on the basis of its authors' backgrounds, it is reasonable to assume that a religious interpretation of the theory would equate the intelligent designer with the Christian God. But ID theory is not nearly as compatible with the Bible's teachings as it may seem at first blush, and natural evolution is not nearly as incompatible with the creation story as it seems.

5.1 The Creation Story

Finding a suitable hermeneutic for the creation story in Genesis 1 is one of the Bible's great challenges. Those who favor a strict, literal interpretation have been roundly mocked by the scientific community for years. Just as an example, a rough chronology of Bible stories would account for an earth that is slightly over 6000 years old, and yet science places the age of the earth at somewhere between 4.5 and 4.8 billion

[9] http://www.tparents.org/Library/Unification/Talks/Wells/DARWIN.htm

[10] The alleged wedge memo, which has not been acknowledged by the CRSC, is reproduced at http://www.stephenjaygould.org/ctrl/crsc_wedge.html. Of particular concern is the role that ID plays in destroying not just Darwinian evolution, but also "materialism," defined as any belief system that does not include God.

years. On this point among many others, the literal interpretation and the scientific evidence seem to be irreconcilable.

And yet, once the literal interpretation is surrendered, the pliability of the text is somewhat remarkable. The language, clearly intended to be poetic, permits a wide range of interpretation. For example, verses 24 and 25 of Chapter 1 describe the origin of creatures.

> [24] And God said, 'Let the earth bring forth living creatures of every kind: cattle and creeping things and wild animals of the earth of every kind.' And it was so. [25] God made the wild animals of the earth of every kind, and the cattle of every kind, and everything that creeps upon the ground of every kind. And God saw that it was good.

The passage does not open by saying that God made the creatures directly, it says that God said to "Let the earth bring froth living creatures." Not only does this relieve God of the specific tasks behind making the creatures, it removes him from the picture altogether. Although verse 25 is more explicit ("God made ..."), that could be a re-statement of the action that was taken in verse 24. By speaking, God caused *the earth* to bring forth living creatures. The harmony with evolutionary theory is startling.

Sadly, the creation of man is separate from the process of the creation of animals. Verses 26 and 27 leave less room for the kinds of interpretation than was present in verse 24.

> [26] Then God said, 'Let us make humankind in our image, according to our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the wild animals of the earth, and over every creeping thing that creeps upon the earth.' [27] So God created humankind in his image, in the image of God he created them; male and female he created them."

However, the second telling of the creation story harks back to the creation of the animals. Chapter 2, verse 7 depicts God famously creating man "from the dust of the ground ... breath[ing] into his nostrils the breath of life." Again, when a literal interpretation is surrendered, the image of man as an organic product of earth leaves room for the idea that man was not an alien being place on earth with no connection to his surroundings. Instead, the image is of man who is fundamentally a part of his environment; made by God, but from materials that are decidedly un-holy.

Ultimately, those looking for conflict between science and the Genesis account of the creation of life will be able to find it. As a literally told story, it would require actions and forces that are so far out of the realm of human knowledge as to render science meaningless. And yet, if one starts with science and looks back at the story, the conflict seems less clear. Genesis, when viewed as a poetic description of the work of evolution, provides hope for the Christian scientist.

5.2 Testing God

But the creation story is not the only Biblical passage that speaks to the ID movement. Deuteronomy 6:16 reads, "Do not put the Lord your God to the test, as you did at Massah." Recalling the wandering in the desert, this commandment proscribes men from making demands of God. At Massah, the Israelites were thirsty, and they complained to Moses about their thirst, going to far as to ask why he brought them out of slavery only to kill them in the desert (Exodus 16-17). Moses, of course, relayed these concerns to God, and God provided water. But this was the first example of God's people demanding some behavior from him.

When the episode repeats itself again later, when the people beg for quail instead of water, God is less forgiving. The people again overstate their condition, saying "We remember the fish we used to eat in Egypt

for nothing ... now our strength is dried up and there is nothing at all but this manna to look at" (Numbers 11:5-6). When Moses relays this request to God, God tells Moses that he will give them so much quail that "it comes out of your nostrils and becomes loathsome to you - because you have rejected the Lord who is among you, and have wailed before him, saying, 'Why did I ever leave Egypt?'" When Moses responds that he does not believe there is enough meat in the world to fulfill that threat, God replies, "Is the Lord's power limited? [or 'Is the Lord's hand too short?]" And when the Lord does cover the ground with quail and the people eat the meat, it causes them to be stricken with plague.

The relationship that is of particular concern is between *testing* God and *rejecting* God. In the this episode, God clearly expects his followers to believe in what He has promised, in this case, that he would take care of them, even in the face of evidence that his promise would be broken. Moreover, the second episode, his followers not only demand that they be taken care of, but that they be indulged; that God extend his promise to meet their desires. This insolence is greeted by punishment. The clear implication is that man should trust in the Lord unconditionally and without a need for evidence.

When ID theory posits itself as science and puts God in the place of the intelligent designer, it puts God to the test. If ID theory is to be considered a serious science, it must be tested. In order to verify its claims, at some point, there will need to be a demonstration of God's work; this is exactly the kind of test God is warning against. By insisting on a manifestation of God's power in the evolutionary process, ID advocates have brought God into an arena where belief in Him is contingent on some action on his part. If God's action in the evolutionary realm has to be formalized and observed, it represents a loss of trust and, ultimately, a rejection.

Moreover, the strange scientific role that ID has fashioned for God suggests limits to His power. If God created and guides the evolutionary system that leads to life as we know it, it happens so infrequently as to have never been observed by science. Moreover, it implies that God fails to step in when evolutionary mechanisms go awry, as in the case of birth defects and genetic illnesses. Finally, God has not only failed to leave any evidence of His work, but has intentionally camouflaged it among actions that happen entirely at random. The image of a God who works in these ways recalls the book of Job where God is destructive and silent throughout most of the book, only breaking his silence to scold Job for questioning His actions.

Ultimately, the problem with the ID image of God is that of constraint. By carefully circumscribing God's actions into a few highly technical yet entirely mysterious moments, the mystery of a larger creation is lost. If we are the product of an intentional design, why was evolution necessary, and what is our ultimate purpose? (And are we even in our final form yet?) ID achieves its purpose by creating space for God in the science classroom, but the space is too small for Him to fit comfortably.

6 Conclusions

Intelligent Design is fairly easily refuted as a scientific endeavor and, as the previous section demonstrates, its theology is highly questionable. And yet, as a movement, it is continuing to gain steam. On Tuesday, January 18, 2005, high schools in the Dover, Pennsylvania area were required to read a statement that said, in 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," is available for students who might be interested in gaining an understanding of what intelligent design actually involves.

The book **Of Pandas and People** [3] is a 1989 "textbook supplement" that has been roundly condemned by, among others, the National Association of Biology Teachers.[11] Philip Johnson described the book as "Hamlet without Hamlet" for its ability to skirt the law while promoting ID. [8]

Moreover, the larger battle is being lost. In a 2004 Gallup poll,[12] only a third of Americans believe that "evolution is a scientific theory supported by evidence," and 45% believe that God created humans in their present form in the last 10,000 years (*Homo erectus* is believed to have originated in Africa between 1.8 million and 1.5 million years ago). Despite a mountain of physical evidence, a slew of winning court cases, and the vindication that comes with much of modern technology, scientists are losing the battle for the hearts and minds of Americans when it comes to evolution. Especially when considered in the light of the ID movement, it's clear that evolution holds the key to some deeper human insecurity. It's well past time for scientists to ask themselves: if you are so right about evolution, why do so many Americans think you're wrong?

One cynical answer is that evolution is the trunk of the "tree of unbelief," an illustration created by various pro-creationist groups (Figure 3). In the philosophy summarized by this picture, evolution represents a pathway between human shortcomings (presumably greed, lust, and other basic sins) and the establishment of harmful institutions (including the usual suspects: homosexuality, communism, and "hard rock"). But instead of dismissing this line of thinking out of hand, scientists would do well to look past the inflammatory rhetoric and consider the deeper concern, namely, the human loss of specialness.[13]

The Biblical creation story is a blanket affirmation of humans as special. In Genesis 1-2, God creates the earth as His special domain, creates animals as his special creatures, and sets man as the most special creature of all; he is given dominion over the land and the animals. In this worldview, man is the center of all attention, both on heaven and earth. He is entirely unique and the most important element of the system. This story is particularly powerful because it informs the reader that he has a special responsibility with respect to the world around him. The earth was created for you, it says, and you are responsible to a higher being who has placed you as its master.

But, from a theological perspective, the whole history of science has been about disassembling this narrative. Early physics taught us that the earth is not at the center of the universe; instead, we revolve around the sun. And the sun is not the center of the universe either, but merely one planetary system in a much larger physical system. Geology has taught us that the history of the earth extends far beyond our own, and that the short duration of human history on this planet is but a minute part of a much longer, larger overall story. Modern biology continues this narrative by teaching us that not only are we not so special on our own planet as compared to animals like apes, but that we share many of our genes with yeast. Viewed in this light, evolution is the final, definitive statement that humans are not special. And this loss of specialness could have horrifying implications: a complete breakdown of moral systems that are based on the unique human.

The irony behind this fear is that the vast majority of people are completely comfortable believing both in evolution and in human specialness. There are creationists who deny many of the fundamental tenets of modern science and decry the destructive forces of technology ... on elaborate web pages. And there are scientists who believe in evolution as an unquestioned fact, but still love their families, give to charities, and generally treat other human beings with respect. Living with this intellectual and spiritual schizophrenia is simply a part of life for many people. How can this be?

The answer, I believe, lies in the following proposition: we will never know the truth about our origins. Barring a completely unforeseen development in time travel, there will never be a definitive answer about how humans came to our present form. The structures that we have in place for morality and ethics as well as for science and reason have thrived and grown without this answer, and they will continue to do so. And

[11] http://www.nabt.org/sub/evolution/panda1.asp

[12] http://www.gallup.com/poll/content/login.aspx?ci=14107

[13] The "retreat from specialness" idea (minus any religious reference) originated with Rodney Brooks' *God and Computers* lecture in 1997

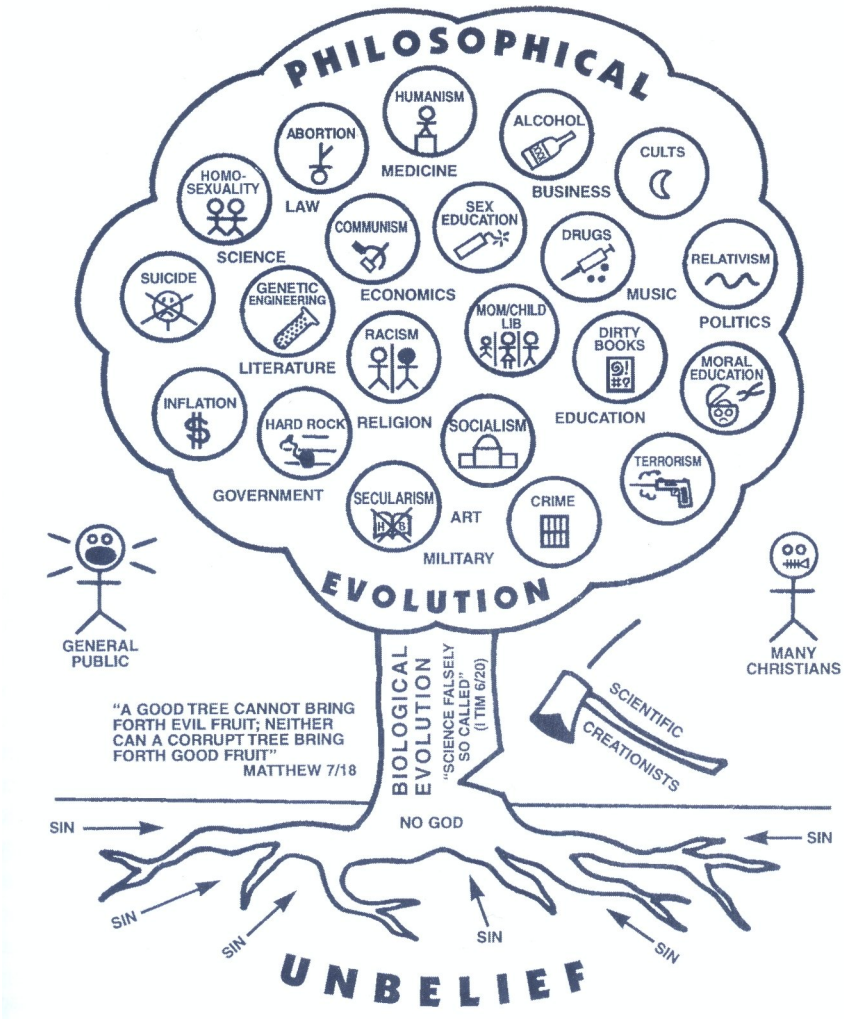

Figure 3: The "tree of unbelief," from [11].

so, in the final analysis, ID fails to contribute in any way to either the scientific understanding of evolution or the theological underpinning of morality.

References

[1] Michael Behe. *Darwin's Black Box*. Simon & Schuster, Inc., 1996.

[2] Charles Darwin. *Origin of Species*. Gramercy Publishing, 1995.

[3] Percival Davis and Dean Kenyon. *Of Pandas and People: The Central Question of Biological Origins*. Foundations for Thought & Ethics, 1989.

[4] William Dembski. *No Free Lunch*. Roman & Littlefield, 2001.

[5] Michael Hagmann. Between a rock and a hard place. *Science*, 295:2006–2007, 2002.

[6] Phillip Johnson. *Darwin On Trial*. InterVarsity Press; 2nd Edition, 1993.

[7] Edward Larson. *Summer for the Gods: The Scopes Trial and America's Continuing Debate over Science and Religion*. Havard Universty Press; Reprint edition, 1998.

[8] Erik Larson. Darwinian struggle. *Wall Street Journal*, 224:A1, Nov14, 1994.

[9] Richard Losick, Adam Driks, and Peter Margolis. Differentiation and the establishment of cell type during sporulation in bacillus subtilis. *Current Opinion in Genetic Development*, 3:330–5, 1991.

[10] William Paley. *Natural Theology ; Evidences of the Existence and Attributes of the Deity*. Lincoln-Rembrandt Publishing, 1986.

[11] Massimo Pigliucci. *Denying Evolution: Creationism, Scientism, and the Nature of Science*. Sinauer Associates, Inc., 2002.

[12] Jonathan Wells. *Icons of Evolution*. Regnery Publishing, 2000.