Thinkpieces

THE INTELLIGENT-DESIGN MOVEMENT: SCIENCE OR IDEOLOGY?

by Gregory R. Peterson

Abstract. The past decade has seen the rise of a new wave of criticism of evolutionary biology, led by claims that it should be replaced by a new science of intelligent design. While the general question of inferring design may fairly be considered worthy of attention, claims that intelligent-design theory (IDT) constitutes a biological science are highly problematic. This article briefly summarizes the assertions made about IDT as a biological science and indicates why they do not stand up to analysis. While claiming that IDT is a biological science, its advocates have failed to actually produce a research program that merits serious attention. As such, it is clear that IDT is more driven by ideological considerations than by attention to actual scientific research.

Keywords: Michael Behe; demarcation; William Dembski; evolutionary theory; intelligent-design theory; Imre Lakatos.

The past decade has seen the rise of a new movement seeking to create a science of intelligent design. Explicitly theological in character, intelligent-design theorists have sought to reintroduce the notion of divine design as a scientific hypothesis to be considered alongside and in place of naturalistic accounts of cosmic and biological origins and change. To say the least, such claims have been far from uncontroversial, having produced considerable polemic and, within some quarters, heated academic debate.

Gregory R. Peterson is Assistant Professor of Religion and codirector of the Global Institute at Thiel College, Greenville, PA 16125; e-mail gpeterso@thiel.edu. A version of this paper was originally presented as "Will Intelligent Design Ever Be a Science?" at the conference "Intelligent Design: Science and Theology in Consonance?" in Fredericton, New Brunswick, September 2000.

[*Zygon*, vol. 37, no. 1 (March 2002).]
 ISSN 0591-2385

Much of this debate has centered on the validity of the design inference (Dembski 1998a), the viability of specific examples or models of design (Behe 1996), the role of methodological naturalism in science (Moreland 1994b), and the proper relationship between science and theology (Dembski 1999).

Although of some significance, these issues are in many ways tangential to the central and most controversial question: Is intelligent design truly a scientific research program? Because of the wide-ranging assertions made by intelligent-design advocates, this question is difficult to answer. Intelligent design is said to apply to physical cosmology, biochemistry, human evolution, and cryptography, among other areas. The central area of contention, however, has been biology and the theory of biological evolution, and it is here that intelligent-design theory (IDT) has most emphatically staked its claim, insisting that current evolutionary theory is incomplete and that the development of intelligent design within biology will stimulate a revolution in thinking about issues of origin and speciation. According to its proponents, IDT stands to revolutionize biology.

But has IDT really developed a scientific program to compete with evolution and natural selection? At best, the answer is not yet. One can argue that IDT is still quite young, but it has not engaged in the kind of behavior appropriate for a rising research program. Rather, it has largely pursued a strategy of populist persuasion, by and large eschewing the kinds of activities normal to scientific development. This, combined with the meagerness of its scientific claims and agenda, suggests that not only is intelligent design not yet a scientific research program, there seems little reason to believe that it will ever constitute such. In their pursuit to discredit evolutionary biology and to portray intelligent design as a scientific theory, ID advocates have obscured much of interest and importance in thinking about the relationship of God and world. By radically polarizing and politicizing the science-and-religion dialogue, advocates of IDT stand to reverse two decades' worth of constructive dialogue and to reinvigorate the fractious ghosts of religion-science conflict and legal action.

The Central Claim: Intelligent Design as a Biological Science

According to one view, theories of intelligent design are as old as the philosophical tradition in the West. Aristotle's inclusion of final cause in his analysis of the physical and biological worlds and the Stoics' inference of the existence of God from biological complexity point to the early existence of arguments regarding purpose and design (cf. Cicero, *De Natura Deorum*, Book II:12–14). While the modern ID movement draws from this historical well, its primary affinity is with the more scientifically (some might say scientistically) minded design arguments of the eighteenth and

nineteenth centuries. Indeed, William Dembski gives a positive evaluation of these early efforts at the same time that he acknowledges weaknesses (1999). Like these scientists from an earlier era, the modern ID movement seeks to explain biological and other forms of physical complexity in terms of the actions of a divine intelligent agent. Furthermore, they claim that such an explanation is scientific in character and therefore should be funded and taught in the same manner as other scientific theories.

The great difference between modern proponents of IDT and their predecessors is, to put it succinctly, one hundred years of evolutionary theory. Almost any example of IDT literature reveals that two wars are being fought. On one hand, ID theorists are resolutely opposed to completely naturalist explanations of biological complexity, with special antagonism reserved for the modern neo-Darwinian synthesis. On the other hand, ID theorists offer the hypothesis of intelligent design as a superior alternative, whose rejection is (allegedly) based on the secularist dogmatism of modern scientists. For IDT these two positions are closely linked. The central task of IDT is, in short, to reintroduce God into the equations of science. To do this, theorists must also counter four hundred years of history that has moved in precisely the opposite direction.

Consequently, opposition to methodological naturalism is central to ID rhetoric. According to the common construal of this principle, methodological naturalism is seen as an underlying principle of natural science. Methodological naturalism prohibits reference to God or other supernatural entities in any scientific explanation. If an atheist were struck by lightning after taking the Lord's name in vain, a vindictive theist might attribute it to God's will. A scientist, however, would look for natural causes.

ID theorists reject the principle of methodological naturalism, claiming that it is a form of implicit atheism and that it has failed to account for basic features of biological function and history (Johnson 1991; Moreland 1994b). Instead, they argue for a theistic science. According to J. P. Moreland,

> Theistic science can be considered a research program . . . that, among other things, is based on two propositions:
>
> 1. God, conceived of as a personal, transcendent agent of great power and intelligence, has through direct, primary agent causation and indirect, secondary causation created and designed the world for a purpose and has directly intervened in the course of its development at various times. . . .
> 2. The commitment expressed in proposition 1 can appropriately enter into the very fabric of the practice of science and the utilization of scientific methodology. (Moreland 1994b, 41–42).

Moreland's second point is, of course, the more important. Theistic science asserts not only that traditional theological doctrines such as *creatio ex nihilo* (creation from nothing) are true but that some theological claims are actually scientific in character and should be a part of appropriate scientific inquiry. In fact, any true account of such issues as the origin of life,

according to the hypothesis of theistic science, necessarily invokes the concept of God—or at least a designer.

While theistic science may be an eventual goal, the claim is that ID is a present reality, is a scientific hypothesis that successfully explains the occurrence of irreducible (or specified) complexity in (among other places) biological organisms. Consequently, IDT is in conflict with evolutionary and particularly Darwinian accounts of the origin of life and the origin of species. The scientific character and status of IDT is emphasized.

> What has emerged is a new program for scientific research known as intelligent design. Within biology intelligent design is a theory of biological origins and development. Its fundamental claim is that intelligent causes are necessary to explain the complex, information-rich structures of biology and that these causes are empirically detectable. To say intelligent causes are empirically detectable is to say there exist well-defined methods that, on the basis of observational features of the world, are capable of reliably distinguishing intelligent causes from undirected natural causes. (Dembski 1998b, 16)

The framework for IDT comes almost entirely from Dembski and Michael Behe. Dembski, a mathematician and philosopher at Baylor University, has developed theoretical and mathematical grounds for detecting design (1998a). Behe, a biochemist at Lehigh University, has been primarily responsible for developing examples from molecular biology that seem to be unexplainable by standard evolutionary explanation (1996). Fairly clearly, IDT conceives of itself as an ambitious project, providing not just an alternative scientific account for biological origins and specified complexity but an account that breaks down the wall between theology and science. Indeed, if Dembski and Behe are correct, IDT would truly be the most significant scientific theory ever, for it would in essence prove the existence of God. If vindicated, the names of Dembski and Behe will be remembered alongside those of Newton and Einstein. I suspect, however, that the truth lies elsewhere.

The Nature of Science

In bidding for scientific status, IDT advocates raise the question of demarcation. That is, by what criteria can we determine what is and is not science? Unfortunately, this has been one of the more difficult questions to answer, with the result that a number of formulations over the course of the past century have met with different levels of satisfactoriness. Among these, the earliest criterion is that set by the logical positivists, who argued that scientific (and indeed all) truth claims are those that can be verified. The verification principle, however, quickly ran into several problems, even when applied to the domain of science, for an experiment does not confirm a hypothesis as much as it disconfirms others. Karl Popper, therefore, asserted that scientific hypotheses were characterized by their falsifiability.

Physics may be considered a science, but psychoanalysis and Marxism, according to Popper's standard, fail (1959; 1971).

Although Popper's criterion remains useful in a heuristic way, it has since been significantly qualified. Most notably, Thomas Kuhn's work (1962) utilized the history of science to show that science rarely proceeded in such a neat and tidy fashion. Rather, science was often characterized by prolonged periods of research based on a paradigm—an undergirding set of theories, formulas, and exemplars that indicated acceptable areas of inquiry and prescribed the kinds of answers one was likely to obtain thereby. Paradigms, in Kuhn's analysis, are highly resistant to falsification, and it is only when a succession of paradigm defeats builds up that a crisis occurs, spawning competing and incompatible theories. Eventually, one such theory proves successful, establishing a new paradigm, and the cycle repeats.

While Kuhn's account of scientific change became widely popular, many saw it (somewhat wrongly, in my view) as too irrational in character. Of the successors to Kuhn's approach, one that has been most influential is that of Imre Lakatos (1970), particularly in theological circles (see Murphy 1990; Peterson 1998). Lakatos argued that science is characterized by competing research programs. A research program is characterized by a set of hard-core and sometimes unverifiable theoretical claims and commitments. Through the development of auxiliary hypotheses, testable consequences and elucidations of the theory are devised (positive heuristic), accompanied by needed ad hoc hypotheses and arguments that shore up weak areas of the theory. A research program that is progressive has its hypotheses repeatedly confirmed, discovers unexpected novel facts, is able to explain the phenomena accounted for by competitor theories, and furthermore explains phenomena that competing theories cannot explain. By contrast, a degenerating program will either do none of these or, on the whole, do them poorly. Lakatos acknowledges the complex communal and historical element of scientific research and at the same time provides a demarcation criterion. Progressive research programs can be considered scientific in character. Degenerating research programs, however, eventually reach a point at which they cease to be scientific. In Lakatos's analysis, however, demarcation is not clean-cut. Programs can experience brief periods of degeneration, only to rebound later. In comparison to Popper's clear falsification criteria, Lakatos's criteria are much more general and difficult to analyze. A number of factors must be considered before the success of a program can be determined and, consequently, an element of human judgment at the expense of algorithmic certainty appears. For this reason, it is not merely a matter of judging whether a particular research program is scientific but also of determining whether it is good science or bad science.

Despite these vagaries, Lakatos's approach appears to attain at least a minimum standard of science and, more generally, of all empirical query.

It is nicely consistent with a variety of historical examples, such as the transition from Ptolemaic to Copernican cosmology as well as the more recent advent of plate tectonics in geology. It also accounts for such prolonged issues as the dinosaur-extinction debate, which involved more than one discipline and several years of sifting through relevant data (Glen 1994) and provided a way of thinking about such "fringe" sciences as creation science, parapsychology, and astrology. In theory, one could announce the arrival of astrological science. We could even be charitable in evaluating it in the early years. But eventually it would have to produce. If no truly testable form of the theory emerged, if it continually appealed to ad hoc hypotheses and after-the-fact adjustments to failed predictions, there would be little reason to consider it seriously.

By affirming a broadly Lakatosian approach, I necessarily concede the philosophical point that science is not necessarily limited by methodological naturalism. In theory, one could design a theistic or metanatural research program that would be scientific in character. However, I emphasize the words *in theory*. While a Lakatosian approach may provide the minimum standard for science, it does not by itself mention all of the relevant criteria used in much of scientific practice. Quantification and experimentation, although not always attainable, are certainly desirable. Generally speaking, no science is completely quantifiable, and the natural sciences experience a range of levels of quantification. A similar observation may be made about experimentation. Furthermore, a good scientific program is often able to tie in claims with a variety of other existing programs in neighboring fields. With reference to plate tectonics, continental drift eventually helped thinking about species diversity and extinction events.

In the present case, I would add two further criteria that may be of particular importance in the current debate. A mature science is based on, among other things, a well-formed intellectual framework and accompanying hypotheses. That is, a well-formed scientific research program has clear claims and clearly testable goals, and it will be able to give clear interpretations of data when that information arrives. The theory of punctuated equilibrium has suffered in large part because of this very problem. While punctuated equilibrium in some form may be true, Stephen Jay Gould and Niles Eldredge have been criticized for never providing the kind of criteria to make it an unambiguous and clearly defined hypothesis (Gould and Eldredge 1972; Somit and Peterson 1989). Even more pertinent than this, however, is a second, albeit not completely scientific, criterion. Extraordinary claims require extraordinary evidence. Certainly, the claim of IDT is extraordinary. Not only are its theorists arguing that some organisms are intelligently designed; they are arguing that they are intelligently designed by God—an extraordinary claim of the first order. Little wonder, then, that the great majority of those in the scientific community have treated IDT with extreme skepticism.

While questions of demarcation are tricky, they are nevertheless necessary in making practical decisions about what counts as knowledge and, consequently, what should be taught in schools and funded by the government and granting institutions. By asserting that IDT is a science, advocates of IDT might genuinely appeal to a Lakatosian understanding to justify their status. Certainly, questions of detecting design and the legitimacy of inferring the existence of a designer are interesting ones, and they deserve some attention. Certainly, the question of whether one can infer God as a designer has a long intellectual tradition behind it and is still debated among philosophers, theologians, and some physical scientists. If this was all that IDT advocates proposed, their position would be much less controversial. But they have been insistent that IDT is primarily a *biological* science. It is here that the real trouble begins and where even a broadly Lakatosian approach to science works against them.

Intelligent Design as a Biological Hypothesis

According to its proponents, IDT is a scientific research program. Unlike many other branches of science, IDT is not focused on a limited temporal or spatial domain. It is not simply a science of biological organisms or subatomic particles. Rather, its theorists argue, IDT is relevant to all origin issues, from cosmology to biochemistry to human evolution. Despite this, however, advocates consistently claim that it is about the biological sciences that IDT is most concerned and toward which much of its attention is directed. Dembski states clearly that "the focus of intelligent design movement is on biology" (1999, 14). Behe's work clearly centers on biochemistry. Of the twenty-five articles contained in Moreland's *The Creation Hypothesis* (1994a) and Dembski's *Mere Creation* (1998a), at least eleven are centrally concerned with biology. In these articles, furthermore, IDT is not limited to the realm of biochemistry but includes accounts of human evolution, phylum diversity, and altruism. The claim, therefore, is that IDT has wide-ranging implications for the study of biology, presumably extending across a number of subdisciplines.

The biological science of IDT presumes, at least in theory, several propositions. First, IDT assumes the existence of what may be called "deep time," scientific evidence for the antiquity of the universe (on the order of 13 billion years) as well as the antiquity of Earth (roughly 4.5 billion years) and of life (roughly 4 billion years). For instance, Behe states, "For the record, I have no reason to doubt that the universe is the billions of years old that physicists say it is. Further, I find the idea of common descent (that all organisms share a common ancestor) fairly convincing, and have no particular reason to doubt it" (1996, 5). Similar affirmations have been made by Dembski and others in the IDT movement. Second, as the quotation from Behe implies, IDT does not claim that evolution never occurs

or that natural selection does not play a role in the origin of some species. Thus, while IDT proponents spend a great deal of their time attacking Darwinism specifically and evolution in general, we are presumably to understand this not as complete refutation of Darwinian and evolutionary processes but as a critique of their misapplication to biological phenomena that are best viewed in terms of intelligent design.

It should be observed, however, that the commitment to both of these propositions seem rather tepid. ID theorists, for instance, make virtually no effort to distinguish themselves from the even more dubious young-Earth creation-science movement; indeed, it is unclear into which camp individuals like Moreland fall. Whereas muting these claims may be a way of showing evangelical Christian solidarity, it does little to further IDT's agenda in scientific circles, where the two movements are easily confused. Furthermore, such vitriol is heaped upon evolutionary explanations that it is not clear whether, in truth, IDT proponents accept any evolutionary account of biological organisms. I will choose to take IDT's support of deep time, evolution, and Darwinism at their word, but I maintain that their public presentation on these issues is highly problematic, leading one to suspect that they believe there to be no real support for these at all.

Two other propositions, however, form the core of IDT, and these are the most important for the scientific status of the movement. First, Dembski (1998a) has devised a logical apparatus for detecting design. According to Dembski, design can be detected through the elimination of chance and law hypotheses and that this "design filter" has a potentially wide range of applications, from cryptography and SETI (search for extraterrestrial intelligence) to cosmology and biology. I will not evaluate here the validity of Dembski's apparatus. In truth, the design filter on first glance captures much of the intuition behind the notion of design, and his packaging it as a logical, algorithmic structure is certainly thought provoking. At the same time, it is not clear to me that the design filter is unproblematic. Brandon Fitelson, Christopher Stephens, and Elliott Sober (1999), for instance, provide a rather stinging analysis of several central aspects of the design filter. Notoriously problematic is the purely negative character of the filter. Design is detected not by any positive characteristic such as the presence of iridium in a sedimentary layer that reveals a large meteor impact but rather by elimination of all the alternatives. According to Fitelson, Stephens, and Sober, this gives design a privileged status. Design can never be falsified, only confirmed. Furthermore, Dembski claims that his filter avoids the need for determining prior probabilities (that is, more or less, the need for knowing the likelihood of the hypothesis before being able to determine the likelihood of the hypothesis), something that he touts as a superior feature of his filter. Yet such prior probabilities must be implicit in any assessment of chance and law hypotheses. Both of these issues are generally relevant to the scientific status of intelligent design.

A second key proposition of IDT is that designed structures can be detected in the natural world. A designed structure is recognized by its irreducible complexity (Behe), denoted by Dembski as specified complexity. For Behe, biochemistry is the key science in finding irreducible complexity. Biochemistry is "Darwin's black box," the assumed substratum upon which all evolution must depend. Structures as diverse as the bacterium flagellum, blood-clotting systems, and the eye (yet again!) are all identified as irreducibly complex structures, unexplainable by appeals either to chance or to natural selection. Having proven unable to provide an empirically adequate account of transitional forms that could explain these structures, Behe concludes that they are irreducibly complex. Because they are irreducibly complex, they are products of design, and after briefly considering alternatives he ascertains that the only conceivable designer in these cases is a divine being, God.

Given these four propositions (deep time, limited role for evolution, a method for detecting design, and the applicability of the method to biology), it is worth commenting on what kind of theory of biology IDT presents. Despite the rhetoric to the contrary, IDT is not a competitor to evolutionary accounts of biological origins (which is outside evolutionary theory proper anyway) and the origins of species. Rather, it is a *modification* of such accounts. That is, IDT is a form of evolutionary theory. Common descent is accepted (at least by Behe), with the caveat that there are organisms whose normal progression of descent is modified by an intelligent designer. These design modifications may have strong phenotypic implications in multicellular organisms, but the locus of ID is at the biochemical level. Such design features, furthermore, are saltations. That is, they are sudden changes in the structure of the organism, creating a new "hopeful monster" that presumably would still have to meet the criteria of natural selection in order to survive.

Thus, IDT provides a saltationist account of evolution, the innovation being the claim that many important, adaptive saltations cannot happen by chance but must be the consequence of design. Put in this light, the impact of IDT when applied to biology seem less startling than at first glance. Saltationist theories of evolution have been proposed before. In fact, Lynn Margulis's account of the bacterial origin of mitochondria in eukaryotic cells might be regarded as a saltationist account of a whole branch of life that nevertheless falls within the domain of natural selection. The difference of IDT, of course, lies in the *mechanism* of saltation. For ID theorists, some saltations result from neither chance nor natural selection. Thus, IDT proposes a radical theory to account for, presumably, a scattered set of problematic phenomena within a broader evolutionary framework.

ID as Science: An Assessment

Given this description, we may then move to the central point by asking, Is IDT truly scientific in character? Does it warrant our attention in the same way that Newtonian mechanics, thermodynamics, or even evolutionary theory does? Among the several ways to address this issue, three are particularly relevant. First, is IDT well formed? Second, does IDT truly provide an account that competes with evolutionary claims? Third, is IDT progressive in a scientific sense?

It is certainly the case that IDT asks well-formed questions. IDT is concerned with the origin and development of complex, biological structures. This concern is in no way unique to IDT but is shared by a number of competing programs. Such an issue is especially acute at the point of the origins of life, and IDT theorists are right to see the RNA world hypothesis and Stuart Kauffman's (1995) claims about self-organizing systems as competing theories attempting to explain the same phenomena. If either of these proved correct, clearly this particular claim of IDT would be falsified.

It is not obvious, however, whether IDT provides a well-formed answer. ID theorists claim to be able to detect instances of specified complexity and then go on to attribute such phenomena to the work of intelligent design. Yet, this point is largely unargued; indeed, Dembski admits that specified complexity is not *necessarily* a sign of intelligent design (1998a, 9). As Howard Van Till observes (1999), this renders the central claim of IDT a bit circular. Specified complexity reveals intelligent design. Intelligent design is whatever produces specified complexity.

More problematic, however, is what is supposed to count as intelligence. ID theorists rely on a largely intuitive concept of intelligence. Intelligence, after all, is a human quality. According to Dembski (1998a, 62), the importance of intelligence is "directed contingency, or what we call choice." Although insightful in some ways, this definition is hardly conventional among psychologists and cognitive scientists, who in many cases avoid the term *intelligence* altogether. Intelligent actions can include a variety of things. The ability to follow an algorithm was, until the advent of the computer, one popular criterion. Trial-and-error learning is invoked in some quarters, whereas others might focus on the category of creative insight.

Furthermore, there are different kinds of intelligences in the world. Computers can now play an unbeatable game of chess, and robots are currently capable of self-navigation and problem solving. More recent computer programs and, some would argue, human intelligences as well use a kind of Darwinian problem-solving approach, choosing the best out of competing hypotheses, which are "selected" for further consideration. Chimpanzees produce tools, and some are capable of symbolic communication. We might regard termite mounds as intelligently designed, but

they are designed by termites, hardly the conventional image of an intelligent designer. If such lowly creatures as termites can produce termite mounds, however, can even lowlier, lawlike (and one might say algorithmic-like) processes produce termites? Or must we presume that all creatures that construct artifacts are products of intelligent design and, therefore, are not truly intelligent but have only what philosophers call "derived intentionality"? If that were the case, would not human beings themselves be instances of derived intentionality and not truly a suitable example of original, intelligent agents?

Intelligent-design theorists have consistently resisted even reasoned speculations on the nature of the designer, claiming that this lies beyond the scope of IDT as a science. One can only regard this as one of the strangest examples of a lack of curiosity that exists in the scientific world. After all, if true, IDT has essentially proved the existence of a kind of being previously undemonstrated by science. ID theorists assert that, although irreducible complexity can suggest the existence of a creator, it unfortunately tells us nothing about the character or nature of the creator. Such an assertion, however, is not highly convincing. Archaeologists, after all, specialize in analyzing obviously designed artifacts constructed by human beings throughout history. And while the intent and character of the designers in some cases are not clear, archaeologists spend much of their time constructing hypotheses about the designers and their culture from these selfsame artifacts. It is unclear why biological artifacts should be different.

This is more than an idle point. An intelligent-design theory that refuses to say anything about the designer is either confused or incoherent. Such a theory also negatively affects the scientific character of the discipline, for it essentially disallows the formulation of any hypotheses that might in fact be testable in a positive way. Without a theological science to accompany its biological science, IDT retains a purely negative approach that explains by not explaining.

Does IDT truly provide a competing account to evolutionary claims? Again, the evidence is weak at best, not least because IDT does not truly address many of the central issues that evolutionary theory was designed to address. It is noteworthy to point out that Darwin's magnum opus was not titled *The Origin of Life* but *The Origin of Species*. Darwin wrote not because he was interested in biochemistry but because he was interested in species variation and, in particular, the fact that species varied in interesting and nonrandom ways. Often IDT critics concentrate not on much of the modern scientific character of evolutionary biology but on the slogans that, arguably, are not part of evolutionary biology but inform the way that evolutionary biology is done. Phrases such as "survival of the fittest" and "natural selection" are necessarily vague and amorphous. They and others provide not so much scientific theory as a metatheory, informing

particular scientific practices and providing a heuristic for investigating natural phenomena.

For instance, ID theorists do not provide explanations for island biogeography. Islands typically host a percentage of endemic (unique) species out of all proportion to their size. Moreover, the species represent phyla and orders that one might expect to migrate by sea: birds, snakes, snails, small lizards, and the like. Furthermore, it is clear that the existing or recently extinct (largely because of human activity) examples of these species are not the species that originally migrated. This fact is most obvious in the case of the many examples of large, flightless birds that were found on islands such as Hawaii and New Zealand, which would obviously have been incapable of migration on their own. However, it also can be seen in the variations between the islands themselves, with the variation increasing as the distance between islands or island chains increases. Study of island biogeography was much furthered by Robert Macarthur and Edward O. Wilson's (1967) analysis that suggested a correlation between island size and species diversity.

One might think that the challenge posed by these observations is simply the presence of all these different species. If this were the case, an ID theorist could simply respond that islands have many unique examples of design and would, perhaps whimsically, observe off the scientific record that God has a fondness for islands. This, however, is not the challenge. The challenge is the *patterns* of diversity that are found on islands. A history of the island in terms of evolution and natural selection is consistent with, and to a certain extent predictive of, the existence of large, flightless birds; high rates of endemic lizards and snails; and increased diversity on large islands. IDT, however, not only does not say anything about these patterns; it seems unable to. Any account that IDT could give would necessarily be ad hoc. Why should we expect in advance a greater rate of endemic species on islands? Why should we expect these species to appear to be descended from likely migratory species? Why should we expect to see apparently evolutionary patterns of migration across islands?

While one can only rarely give specific lines of descent for any individual species, evolutionary theory provides a framework in which such diversity is understood and even expected. More important, general terms such as "natural selection" are used to advance more specific hypotheses. "Natural selection" is most cogent in the more specific theoretical claim of allopatric speciation, which suggests that new species are typically formed by small, founder groups that separate from existing populations and gradually grow in diversity. The theory of allopatric speciation is consistent with and even predictive of the observation of higher numbers of endemic species in geographies that do not allow a great deal of transportation, such as islands, insulated valleys, underground lakes, and isolated geothermal vents. Macarthur and Wilson's theory would be an even more specific cashing

out of the implications of the framework of natural selection, even though it is not presented in strictly historical terms.

This argument is applicable as well to the more general trends of natural history. In short, life starts small and gets big. Whereas ID theorists seem willing to accept common descent (meaning, presumably, that God works with the existing biological materials at any given time), IDT gives no account of why we should expect fish to appear first or why all dinosaurs appear much later. It does not explain why Australia became dominated by marsupials such as kangaroos (in carnivorous and herbivorous varieties) and wallabies. It is not enough to say that God works with existing biological materials, a claim that implicitly breaks the ban on describing the designer's intentions. An intelligent designer of divine proportions could presumably implement quite radical saltations. The problem is that natural history exhibits patterns that ID is unable or unwilling to explain, patterns that are consistent with (and to a certain extent predicted by) evolutionary approaches.

Of course, ID theorists could simply concede these broad swaths of inquiry to evolutionary theory, maintaining all the while that within the rather broadly evolutionary world there nevertheless exist specific instances of design. Despite the frequent rhetoric to the contrary, perhaps ID theorists are really claiming that ID is the exception rather than the rule, that ID is relatively rare but important nonetheless. Such a position, at least in theory, is still potentially significant—not least because God is attached to the other end of the equation—but it hardly shakes the foundations of biology. Rather, IDT turns out to be an attempt to explain isolated phenomena that are currently unexplainable and which, as far as the IDT literature reveals, lack the comparative research to establish whether evolutionary hypotheses are even plausible.

The third, and perhaps most important, question remains. Is IDT progressive? That is, does IDT show the hallmarks of a nascent scientific research program? Are there serious parallels between the emergence of IDT and, say, relativity theory or plate tectonics? Sadly, the answer appears to be no. This is in part due to the surprisingly small domain of explanation that IDT has allowed itself. According to its proponents, IDT explains instances of irreducible complexity. That's it. It does not explain how they came to be. It does not explain why they came to be. It does not even explain when they came to be.

Yet, a truly scientific research program should be bursting with questions and working out innumerable implications. After all, IDT asserts not only that we have a reliable design filter but also that we can use this filter to accurately detect design in biological organisms. If this were the case, numerous lines of reasoning could be followed up, even given the dramatic strictures that ID imposes on itself. One interesting question would be, How frequently does design occur? Given that we can detect

design and given that not all organisms are designed, it would be interesting to determine what percentage of organisms exhibit intelligent design. Such data, in turn, could lead to further, more specific questions. Do we find design to be more prevalent in some lines of descent than others? Do humans exhibit more design features than ostriches do? Does God have a fondness for the millions of species of insects, or are they simply the product of natural selection? Are human pathogens such as AIDS, cholera, and malaria intelligently designed? Would not these be interesting questions?

Surprisingly, ID theorists are not pursuing any of these questions. Instead, at the end of his article "Intelligent Design Theory as a Tool for Analyzing Biochemical Systems" Behe (describing the payoff of IDT for studying biology) states the following:

> So what difference does intelligent design theory make to the way we practice science? I believe it is this: a scientist no longer has to go to enormous lengths to shoehorn complex, interactive systems into a naturalistic scenario. . . . We should remain open to the possibility that further analysis will show our conclusion was wrong, but we should not be timid about reaching a conclusion of design and building on it. (Behe 1998, 194)

In other words, the payoff of ID is not increased scientific knowledge but rather relief from the attempt to answer unanswerable questions. Again, the lack of curiosity about the theorists' own hypothesis is remarkable. Instead of engaging in further questions and research, IDT allows us to stop asking questions. Instead of trying to formulate sophisticated scientific questions about design, ID theorists seem to consider this a matter of faith that is not amenable to rational discussion.

This lack of development alone is compounded by a lack of curiosity about the implications of related aspects of the theory that are connected to but outside the realm of biology. After all, how does design occur? Is it a single saltation or a series of them? Does it happen in a single organism or over a series of organisms? More important, what are the mechanisms of ID? How does the design occur? Any change in biochemical structure and information content would suggest an energy expenditure, presumably from outside the natural realm, implying a violation of the law of energy conservation. Does IDT imply this, and if so, how would it work?

These are relatively minor problems when compared to a more central issue. ID theorists have not carried out the agenda of their own program. Dembski's admonition at the end of *The Design Inference* is noteworthy:

> The fact is that the design inference does not yield design all that easily, especially if probabilistic resources are sufficiently generous. It is simply not the case that unusual and striking coincidences automatically generate design as the conclusion of a design inference. There is a calculation to be performed. *Do the calculation. Take the numbers seriously. See if the underlying probabilities really are small enough to yield design*. (Dembski 1998a, 228)

Remarkably, this is the one thing that ID theorists have not done. Nowhere does Behe use Dembski's design-inference apparatus to "do the numbers" and arrive at a solid conclusion of design for such structures as the bacterium flagellum. Even more to the point, Behe shows no inclination to do so; he seems satisfied to give brief examples of complexity in publications aimed at a nonscientific readership. No other ID theorist, to date, has taken up this challenge. Furthermore, ID scientists have not published their views in peer-reviewed scientific publications, so in the majority of cases this work has not been properly evaluated by appropriate professionals.

This last observation is perhaps the most serious. A scientific research program rises and falls on its publication track record, yet IDT does not seem to have even a research agenda that will lead to the kind of data that can be fairly evaluated in a peer-review process. Not only is there no scientific progress; there seems to be no intent to achieve scientific progress. It is not only that IDT does not meet the maximal criteria of science; it is hard to see how it even meets the minimum, Lakatosian criteria of science. While we can certainly characterize IDT as a research program, there seems to be little reason to regard it as a scientific research program, let alone a progressive one. IDT has not worked out the implications of its own claims, has not clearly elucidated its relation to evolutionary biology, has not provided specific scientific data, and has not submitted these for peer review. Furthermore, since it does not seek to explain many of the same phenomena that concern evolutionary biology, it is unclear to what extent IDT constitutes a competing hypothesis. At best, it is a science waiting in the wings.

Concluding Comments

Of course, it could be that IDT publications will soon reverse this situation. After all, Behe's *Darwin's Black Box* is only five years old, far too short a time to get a research program off the ground. And, it is often admonished, we should be charitable to new research programs. True enough, but it is strange that this new research is not reflected in current publications. Surely, if ID theorists had such plans and workings, its advocates would want to advertise them!

Interestingly enough, however, ID seems more inclined to move in the opposite direction, from scientific research to polemical debate. Indeed, the publication trajectory of IDT is revealing. Dembski followed his technical monograph with two books aimed at conservative Christian markets and a receptive conservative Christian audience. The content of these popular works is revealing. In the two anthologies mentioned earlier (Moreland 1994a; Dembski 1998c), as I previously observed, eleven of the twenty-five articles concern biology. Depending on how you define the topics,

fourteen of these articles deal with philosophical attacks on methodological naturalism, claims about design "in theory," or an engagement of philosophical and theological issues. Of those that deal with biology, the vast majority of virtually every article deals not with intelligent design but with why Darwinism is wrong in the particular instance cited. Little that is specific is said about ID in these articles beyond the general claim that it provides a better account of the phenomena than Darwinism does. Dembski's second monograph (1999) abandons the scientific arena for a largely philosophical account that attempts to bridge the gap between science and theology. Science appears to play only a secondary role in IDT literature. The primary concerns are philosophical and theological in character. Indeed, IDT seems to be exactly what it accuses its opponents of being: an ideological agenda masquerading as science.

There is nothing wrong with ideological and philosophical agendas, at least in principle. Indeed, many would share the concerns of ID theorists about naturalism as a worldview. Many scientists agree that the origin of life is, to say the least, immensely puzzling. When an ideology masquerades as something else, however, it becomes deceptive in character. The issues that IDT addresses are serious and worthy of consideration. The approach, however, is misguided and will result in only more painful public encounters at the expense of the religious traditions its proponents seek to defend.

References

Behe, Michael J. 1996. *Darwin's Black Box: The Biochemical Challenge to Evolution.* New York: Touchstone.

———. 1998. "Intelligent Design Theory as a Tool for Analyzing Biochemical Systems." In *Mere Creation: Science, Faith, and Intelligent Design*, ed. William Dembski. Downer's Grove, Ill.: Intervarsity Press.

Cicero, Marcus Tullus. n.d. *De Naturum Deorum*, Book II:12–14.

Dembski, William. 1998a. *The Design Inference: Eliminating Chance through Small Probabilities*. New York: Cambridge Univ. Press.

———. 1998b. "Introduction: Mere Creation." In *Mere Creation: Science, Faith, and Intelligent Design*, ed. William Dembski. Downer's Grove, Ill.: Intervarsity Press.

———, ed. 1998c. *Mere Creation: Science, Faith, and Intelligent Design*. Downer's Grove, Ill.: Intervarsity Press.

———. 1999. *Intelligent Design: The Bridge between Science and Theology*. Downer's Grove, Ill.: Intervarsity Press.

Fitelson, Brandon, Christopher Stephens, and Elliott Sober. 1999. "How Not to Detect Design—Critical Notice: William Dembski, *The Design Inference*." *Philosophy of Science* 66:472–88).

Glen, William, ed. 1994. *The Mass-Extinction Debates: How Science Works in a Crisis*. Stanford: Stanford Univ. Press.

Gould, Stephen Jay, and Niles Eldredge. 1972. "Punctuated Equilibria: An Alternative to Phyletic Gradualism." In *Models in Paleobiology*, ed. Thomas J. M. Schopf. San Francisco: Freeman, Cooper.

Johnson, Phillip. 1991. *Darwin on Trial.* Washington, D.C.: Regnery Gateway.

Kauffman, Stuart. 1995. *At Home in the Universe: The Search for the Laws of Self-Organization and Complexity.* New York: Oxford Univ. Press.

Kuhn, Thomas. 1962. *The Structure of Scientific Revolutions*. Chicago: Univ. of Chicago Press.

Lakatos, Imre. 1970. "Falsification and the Methodology of Scientific Research Programmes." In *Criticism and the Growth of Knowledge*, ed. Imre Lakatos and Alan Musgrave, 91–196. Cambridge: Cambridge Univ. Press.

Macarthur, Robert, and Edward O. Wilson. 1967. *Theory of Island Biogeography*. Princeton, N.J.: Princeton Univ. Press.

Moreland, J. P., ed. 1994a. *The Creation Hypothesis: Scientific Evidence for an Intelligent Designer.* Downer's Grove, Ill.: Intervarsity Press.

———. 1994b. "Theistic Science and Methodological Naturalism." In *The Creation Hypothesis: Scientific Evidence for an Intelligent Designer*, ed. J. P. Moreland, 41–66. Downer's Grove, Ill.: Intervarsity Press.

Murphy, Nancey. 1990. *Theology in the Age of Scientific Reasoning*. Ithaca, N.Y.: Cornell Univ. Press.

Peterson, Gregory. 1998. "The Scientific Status of Theology: Imre Lakatos, Method and Demarcation." *Perspectives in Science and Christian Faith* 50:22–31.

Popper, Karl. 1959. *The Logic of Scientific Discovery*. New York: Basic Books.

———. 1971. *The Open Society and Its Enemies*. 2 vols. Princeton, N.J.: Princeton Univ. Press.

Somit, Albert, and Steven A. Peterson, eds. 1989. *The Dynamics of Evolution: The Punctuated Equilibrium Debate in the Natural and Social Sciences.* Ithaca N.Y.: Cornell Univ. Press.

Van Till, Howard. 1999. "Does 'Intelligent Design' Have a Chance? An Essay Review." *Zygon: Journal of Religion and Science* 34 (December): 667–75.