

Why Intelligent Design Fails

*A Scientific Critique of
the New Creationism*

EDITED BY
MATT YOUNG
TANER EDIS



RUTGERS UNIVERSITY PRESS
New Brunswick, New Jersey, and London

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Introduction

MATT YOUNG AND TANER EDIS

INTELLIGENT DESIGN is the successor to old-fashioned creationism but dressed in a new coat—its hair cut, its beard trimmed, and its clock set back 10 or 15 billion years. It is nevertheless a hair's-breadth away from creationism in its insistence that everyone is wrong but its proponents, that science is too rigid to accept what is obvious, and that intelligent-design advocates are the victims of a massive conspiracy to withhold the recognition that their insights deserve.

Creationism, though very popular in its young-earth version, has failed as a strategy for introducing religious beliefs into the science curriculum. Enter neocreationism, or intelligent design. Not as obviously a religious conceit as creationism, intelligent-design creationism has made a case that, to the public, appears much stronger. Pertinently, its proponents are sometimes coy about the identity of their designer. They admit to the age of the earth or set aside the issue, and some even give qualified assent to pillars of evolutionary theory, such as descent with modification. They have therefore been able to feign a scientific legitimacy that creationism was never able to attain.

This aura of legitimacy has enabled the proponents of intelligent design to appeal to the public's sense of fairness and ask that intelligent design be added to school curricula, alongside Darwinian evolution, as an intellectually substantial alternative. Intelligent design, however, has found no support whatsoever from mainstream scientists, and its proponents have not established a publication record in recognized and peer-reviewed scientific journals. They have nevertheless raised a significant sum of money and embarked on a single-minded campaign to inject intelligent design into the science curriculum.

Intelligent-Design Neocreationism

Biblical literalism, in its North American form, took shape in the 1830s. One impetus was the attack on slavery by religious abolitionists. Slave owners or their ministers responded by citing biblical passages, notably Genesis 9:24–27, as justification for enslaving black people: “And Noah awoke from his wine, and knew what his younger son [Ham, the supposed ancestor of black people] had done to him. And he said, Cursed be Canaan [son of Ham], a servant of servants shall he be unto his brethren. . . . Canaan shall be [Shem’s] servant . . . and [Japheth’s] servant” (King James version).

At about the same time, the millennialist strain in Christianity began a resurgence in Britain and North America. This movement, the precursor of modern fundamentalism, also stressed the literal truth of the Bible (Sandein 1970). Most millennarians and their descendants, however, adjusted their “literal” reading of Genesis to accommodate the antiquity of the earth. Some accepted the *gap theory*: that God created the heavens and the earth in the beginning but created humans after a gap of millions or billions of years. Others accepted the *day-age theory*, which recognized the days mentioned in Genesis as eons rather than literal 24-hour days. There was, therefore, no contradiction between science and their religious beliefs. Many evangelical thinkers went as far as to accept not only an old earth but even biological evolution, provided that evolution was understood as a progressive development guided by God and culminating in humanity (Livingstone 1987).

Evolution education did not become a fundamentalist target until the early twentieth century. Then, in the aftermath of the Scopes trial, literalist Christianity retreated into its own subculture. Even in conservative circles, the idea of a young earth all but disappeared (Numbers 1992).

The pivotal event behind the revival of young-earth creationism was the 1961 publication of *The Genesis Flood*, co-authored by hydraulic engineer Henry M. Morris and conservative theologian John Whitcomb. Morris resurrected an older theory called *flood geology* and tried to show that observed geological features could be explained to be results of Noah’s flood. In Morris’s view, fossils are stratified in the geological record not because they were laid down over billions of years but because of the chronological order in which plants and animals succumbed to the worldwide flood. To Morris and his followers, the chronology in Genesis is literally true: the universe was created 6000 to 10,000 years ago in six literal days of 24 hours each. With time, Morris’s *young-earth creationism* supplanted the gap theory and the day-age theory, even though some denominations and apologists, such as former astronomer Hugh Ross, still endorse those interpretations (Numbers 1992, Witham 2002).

Creationists campaigned to force young-earth creationism into the biology classroom, but their belief in a young earth, in particular, was too obviously religious. A few states, such as Arkansas in 1981, passed “balanced-treatment” acts. Arkansas’s act required that public schools teach *creation science*, the new name for flood geology, as a viable alternative to evolution. In 1982, Judge William Overton ruled that creation science was not science but religion and that teaching creation science was unconstitutional. Finally, the 1987 Supreme Court ruling, *Edwards v. Aguillard*, signaled the end of creation science as a force in the public schools (Larson 1989).

The intelligent-design movement sprang up after creation science failed. Beginning as a notion tossed around by some conservative Christian intellectuals in the 1980s, intelligent design first attracted public attention through the efforts of Phillip Johnson, the University of California law professor who wrote *Darwin on Trial* (1993). Johnson’s case against evolution avoided blatant fundamentalism and concentrated its fire on the naturalistic approach of modern science, proposing a vague “intelligent design” as an alternative. Johnson was at least as concerned with the *consequences* of accepting evolution as with the *truth* of the theory.

In 1996, Johnson established the Center for Science and Culture at the Discovery Institute, a right-wing think tank. In 1999, the center had an operating budget of \$750,000 and employed 45 fellows (Witham 2002, 222). Johnson named his next book *The Wedge of Truth* (2000) after the wedge strategy, which was spawned at the institute. According to a leaked document titled “The Wedge Strategy” (anonymous n.d.), whose validity has been established by Barbara Forrest (2001), the goal of the wedge is nothing less than the overthrow of materialism. The thin edge of the wedge was Johnson’s book, *Darwin on Trial*.

The wedge strategy is a 5-year plan to publish 30 books and 100 technical and scientific papers as well as develop an opinion-making strategy and take legal action to inject intelligent-design theory into the public schools. Its religious overtone is explicit: “we also seek to build up a popular base of support among our natural constituency, namely, Christians. . . . We intend [our apologetics seminars] to encourage and equip believers with new scientific evidence’s [sic] that support the faith” (anonymous n.d.).

Johnson remains a leader of the movement, although he is the public voice of intelligent design rather than an intellectual driving force. That role has passed to Michael Behe, William Dembski, and others.

Intelligent Design in Biology

The intelligent-design movement tries to appeal to a broad constituency, drawing on widely accepted intuitions about divine design in the world (see chapter 1). As the wedge document acknowledges, however, reaching beyond conservative Christian circles has been a problem. Success evidently requires a semblance of scientific legitimacy beyond lawyerly or philosophical arguments.

Thus, intelligent design has gathered steam with the publication of biochemist Michael Behe's book *Darwin's Black Box* (1996), which argues that certain biochemical structures are so complex that they could not have evolved by natural selection. Behe calls such complex structures *irreducibly complex*.

An irreducibly complex structure is any structure that includes three or more parts without which it cannot function. According to Behe, such a structure cannot have evolved by chance because it cannot function with only some of its parts and more than two parts are not likely to form a functioning whole spontaneously. Behe identifies, for example, the bacterial flagellum and the blood-clotting system as irreducibly complex. To prove his point, he relies heavily on the analogy of a mousetrap, which he says cannot function with any one of several parts missing. Behe's argument founders, however, on the pretense that the irreducibly complex components came together at once and in their present form; he makes no effort to show that they could not have coevolved. Chapter 2 shows that Behe's mousetrap is a failed analogy designed to hide this likelihood.

Many intelligent-design neocreationists accept what they call *microevolution* but reject *macroevolution*. That is, they accept the fact of change within a species but reject the idea that a species may evolve into a new species. Chapter 3 shows that their assignment of living organisms into kinds is incoherent and that there is no substantive difference, no quantitative demarcation, between microevolution and macroevolution. The distinction is wholly arbitrary and fragments the tree of life, whereas common descent provides a neat and compact picture that explains all the available evidence.

Chapter 4 shows that the scientific evidence Behe presents is equally flawed. Behe discounts the importance of the fossil record and natural selection and adopts a belief in a designer outside nature because of the concept of an irreducibly complex system, which he cannot defend. He further points to a supposed absence of scientific articles describing the evolution of biochemical systems deemed to be irreducibly complex and a paucity of entries for the word *evolution* in the indexes of biochemistry textbooks. Behe is a legitimate scientist, with a good record of publication. Nevertheless, his claims, which he likens to the discoveries of Newton and Copernicus, are not well

regarded by most biologists, and they are reminiscent of standard God-of-the-gaps arguments.

Chapters 5 and 6 develop the theme introduced in chapter 4. Chapter 5 explains how an irreducibly complex structure can readily evolve by exapting existing parts and then adapting them to new functions. These new functions take form gradually, as when a feathered arm that originally developed for warmth turns out to be useful for scrambling uphill and only gradually adapts for flying. Chapter 5 details precisely how such exaptation-adaptation gradually formed the avian wing.

The eubacterial flagellum is one of the favorites of the intelligent-design proponents and occupies a place in their pantheon that is analogous to the place of the eye in the creationist pantheon. Chapter 6 shows that the flagellum is by no means an “outboard motor” but a multifunctional organelle that evolved by exaptation from organelles whose function was primarily secretion, not motility. It is not irreducibly complex.

Chapter 7 links the previous chapters to those that follow. It shows how the laws of thermodynamics do not preclude self-organization, provided that there is energy flow through the system. In addition to energy flow (an open system), self-organization requires only a collection of suitable components such as atoms or molecules, cells, organisms (for example, an insect in an insect society), and even the stellar components of galaxies, which self-organize through gravitational energy into giant rotating spirals. Using two examples, Bénard cells and wasps’ nests, chapter 7 demonstrates how complex structures can develop without global planning.

Intelligent Design in Physics and Information Theory

Behe passed the torch to mathematician and philosopher William Dembski, who claims to have established a rigorous method for detecting the products of intelligent design and declares further that the Darwinian mechanism is incapable of genuine creativity. Hiding behind a smoke screen of complex terminology and abstruse mathematics, Dembski in essence promulgates a simple probabilistic argument, very similar to that used by the old creationists, to show that mere chance could never have assembled complex structures. Having failed to convince the scientific community that his work has any substance, Dembski nevertheless compares himself to the founders of thermodynamics and information theory and thinks he has discovered a fourth law of thermodynamics (Dembski 2002, 166–73).

Dembski has gone well beyond Behe with a mathematical theory of specified complexity. According to Dembski, we can establish whether or not an

object or a creature was designed by referring to three concepts: contingency, complexity, and specification.

Contingency. Dembski looks to contingency to ensure that the object could not have been created by simple deterministic processes. He would not infer intelligent design from a crystal lattice, for example, because its orderly structure forms as a direct result of the physical properties of its constituents.

Complexity. Dembski defines the complexity of an object in terms of the probability of its appearance. An object that is highly improbable is by the same token highly complex.

Specification. Some patterns look like gibberish; some do not. Dembski calls a pattern that does not look like gibberish *specified*. More precisely, if a pattern resembles a known target, then that pattern is specified. If it does not, then it is a *fabrication*.

Many of Dembski's examples involve coin tosses. He imagines flipping a coin many times and calls the resulting sequence of heads and tails a pattern. He calculates the probability of a given pattern by assuming he has an unbiased coin that gives the same probability of heads as of tails—that is, $1/2$. Using an argument based on the age of the universe, Dembski concludes that a contingent pattern that must be described by more than 500 bits of information cannot have formed by chance, although he is inconsistent about this limit in his examples.

If a pattern is both specified and complex, then it displays *specified complexity*, a term that Dembski uses interchangeably with *complex specified information*. Specified complexity, according to Dembski, cannot appear as the result of purely natural processes. Chapter 7 shows that specified complexity is inherently ill-defined and does not have the properties Dembski claims for it. Indeed, Dembski himself calculates the specified complexity of various events inconsistently, using one method when it suits him and another at other times.

In one example, he dismisses Bénard cells as examples of naturally occurring complexity; they form, he says, as a direct result of the properties of water. Chapter 7 shows that, to the contrary, Bénard cells are highly complex. Chapter 2 also shows how Dembski dismisses the formation of a complex entity such as a snowflake in the same way.

Dembski employs an explanatory filter that purports to use the concepts of contingency, complexity, and specification to distinguish design from chance and necessity. He argues that forensic scientists and archaeologists use a variation of the explanatory filter to infer design in those instances in which the designer is presumed to be human. Chapter 8 shows that forensic scientists

do not solve problems using an explanatory filter; specified complexity and the explanatory filter do not provide a way to distinguish between designed objects and undesigned objects. Indeed, what Dembski calls side information is more important to a forensic scientist than the explanatory filter, which is virtually useless.

Attempts to distinguish rigorously between data that exhibit interesting patterns and data that are the result of simple natural laws or chance are not new. Chapter 9 explores approaches to this problem based on established complexity theory, a part of theoretical computer science. It shows that Dembski's idiosyncratic approach does not deliver what it promises and that mainstream science has much better ways to approach interesting questions about complex information.

Chapter 10 shows that randomness can help create innovation in a way that deterministic processes cannot. A hill-climbing algorithm that cannot see to the next hill may get stuck on a fairly low peak in a *fitness landscape*; further progress is thereby precluded. On the other hand, a random jump every now and then may well carry the algorithm to the base of a taller peak, which it can then scale. Randomness is not inimical to evolution; on the contrary, randomness is critical for its ability to produce genuine creative novelty. Chapter 10 draws upon artificial-intelligence research to show that intelligence itself may be explainable in terms of chance plus necessity, a combination that escapes Dembski's explanatory filter with its stark black-and-white dichotomies.

Dembski extends his argument by applying the no-free-lunch theorems (NFL theorems) to biological evolution. These theorems apply to computer-aided optimization programs that are used, for example, to design a lens by a series of trial-and-error calculations that begin with a very poor design. Roughly, an optimization program is like a strategy for finding the highest mountain in a given range; the height of the mountain represents the value of some figure of merit that we calculate as we go along and whose value we try to maximize.

The NFL theorems, according to Dembski, show that no search algorithm performs better than a random search. In fact, chapter 11 shows that the theorems are much more restricted than Dembski makes out; they state only that no strategy is better than any other when averaged over all possible mountain ranges, or fitness landscapes. In practice, however, we are almost never interested in all possible fitness landscapes but in very specific landscapes. It is entirely possible to design a strategy that will outperform a random search in many practical fitness landscapes. In addition, the NFL theorems apply only to landscapes that are fixed or vary independently of an evolving population,

whereas the fitness landscape in biological evolution varies with time as organisms change both themselves and their environments. Thus, Dembski's application of the NFL theorems is wrong on two counts.

In cosmology, intelligent-design advocates point to the supposed fine tuning of the physical constants and claim that life would not exist if any of several physical constants had been slightly different from their present values—for example, because the lifetime of the universe will be too short for stars to form. Chapter 12 criticizes this anthropic argument, which suggests that the physical constants of our universe were purposefully designed to produce human life. The chapter notes, first, that the claim inherently assumes only one possible kind of life: ours. Additionally, this chapter shows that many combinations of values of four physical constants will lead to a universe with a long-enough life for stars to form and hence for life to be a possibility.

Chapter 13 asks whether, after all, intelligent design is practiced as science. To this end, it shows how certain pathological sciences operate and how they differ from genuine science. Specifically, we argue that the advocates of intelligent design do not practice science, not because their ideas are religiously motivated but because they make no substantive predictions, do not respond to evidence, have an ax to grind, and appear to be oblivious to criticism. Further, we hoist Dembski by his own petard when we demonstrate that his intelligent designer is no more than a *Z-factor*, a term of derision he applies to certain speculative scientific theories.

Chapter 1

Grand Themes, Narrow Constituency

TANER EDIS

IN THE BEGINNING, there was young-earth creationism. Even now, long after evolution has conquered the scientific world, “scientific” creationism remains popular, periodically surfacing to complicate the lives of science educators. This old-time creationism, however, has major shortcomings. Its religious motives are too obvious, its scientific credentials next to nonexistent. There is an aura of crankishness about claiming that special creation is not only scientific but also better than what ordinary science has to offer. In mainstream scientific circles, creationism produces exasperation and sometimes a kind of aesthetic fascination with the sheer extent of its badness. So scientists engage with creationists in a political struggle, not a serious intellectual dispute. Although they may miss opportunities to address some interesting questions (Edis 1998b), there is a limit to the excitement of continually revisiting matters resolved in the nineteenth century.

A new species of creationism, fighting evolution under the banner of intelligent design (ID), is attempting to change this picture. Many ID proponents not only sport Ph.D.s but have also done research in disciplines such as mathematics, philosophy, and even biology. They disavow overly sectarian claims, steering away from questions such as the literal truth of the Bible. And instead of trafficking in absurdities like flood geology, they emphasize grand intellectual themes: that complex order requires a designing intelligence, that mere chance and necessity fall short of accounting for our world (Moreland 1994, Dembski 1998a, Dembski 1999, Dembski and Kushiner 2001). They long to give real scientific teeth to intuitions about order and design shared by diverse philosophical and religious traditions.

At first, we might have expected ID to have a broad-based appeal. Scientists accustomed to evolution and wary of political battles over creationism might have been skeptical; but science is, after all, only one corner of intellectual life. Perhaps ID proponents could appeal to wider concerns and persuade scientists to reconsider intelligent design as an explanation for nature. At the least, it might spark an interesting debate about science and religion as ways of approaching our world and as influential institutions in society.

Curiously, though, very little of this debate has taken place. Academically, ID is invisible, except as a point of discussion in a few philosophy departments. Instead of treating it as a worthy if mistaken idea, scientists typically see it as the latest incarnation of bad, old-fashioned creationism. There has been little support for ID in nonscientific intellectual circles; even in academic theology, it has made inroads only among conservatives. ID promised to be broad-based but could not go beyond the old creationism's narrow constituency. It was supposed to be intellectually substantial, but scientists usually treat it as a nuisance. Most disappointingly, ID attracts attention only because it turns up in endless, repeated political battles over science education.

So what went wrong? Why has the intellectual response to ID ranged from tepid to hostile?

Design, East and West

Stepping outside the western debate over evolution may help us put ID into perspective. Islam has lately attracted much attention as a resurgent scripture-centered faith in a time of global religious revival. It appears to be an exception to the thesis that secularization is the inescapable destiny of modernizing societies, and it impresses scholars with the vitality of its religious politics. Less well known, however, is the fact that the Islamic world harbors what may be the strongest popular creationism in the world and that the homegrown intellectual culture in Muslim countries generally considers Darwinian evolution to be unacceptable.

In Turkey, which has felt modernizing pressures more than most Islamic countries, both a richly supported, politically well connected, popular creationism and a creationist influence in state-run education have appeared over the past few decades (Edis 1994, 1999; Sayin and Kence 1999). In Islamic bookstores from London to Istanbul, attractive books published under the name of Harun Yahya appear, promising everything from proof of the scientific collapse of evolution (Yahya 1997) to an exposition that Darwinism is funda-

mentally responsible for terrorist events such as that of 11 September 2001 (Yahya 2002).

Yahya's work is the Muslim equivalent of old-time creationism in the United States; indeed, it borrows freely from U.S. creationist literature, adapting it to a Muslim context by downplaying inessential aspects such as flood geology. In both its politics and its ability to reach beyond a conservative religious subculture, it is more successful than its U.S. counterpart.

Islamic creationism has much closer ties to intellectual high culture than in the United States. It would be nearly impossible for a creationist book to win endorsements from a prestigious U.S. divinity school, but Yahya's books print the praise of faculty members in leading Turkish departments of theology. One reason is that, in Muslim religious thought, the classical argument from design retains an importance it has long since lost in the west. Partly because of Quranic antecedents, Muslim apologetics at all levels of sophistication often rely on a sense that intelligent design is just plain obvious in the intricate complexities of nature (Edis 2003).

In other words, a kind of diffuse, taken-for-granted version of ID is part of a common Muslim intellectual background. The grand themes of ID are just as visible in the anti-evolutionary writings of Muslims who have more stature than Yahya. Osman Bakar (1987), vice-chancellor of the University of Malaya, criticizes evolutionary theory as a materialist philosophy that attempts to deny nature's manifest dependence on its creator and throws his support behind the endeavor to construct an alternative Islamic science, which would incorporate a traditional Muslim perspective into its basic assumptions about how nature should be studied (Bakar 1999). His desire is reminiscent of theistic science as expressed by some Christian philosophers with ID sympathies, which includes a built-in design perspective as an alternative to naturalistic science (Moreland 1994, Plantinga 1991). Seyyed Hossein Nasr (1989, 234–44), one of the best-known scholars of Islam in the field of religious studies, denounces Darwinian evolution as logically absurd and incompatible with the hierarchical view of reality that all genuine religious traditions demand, echoing the implicit ID theme that ours must be a top-down world in which lower levels of reality depend on higher, more spiritual levels.

The notion of intelligent design, as it appears in the Muslim world or in the western ID movement, is not just philosophical speculation about a divine activity that has receded to some sort of metaphysical ultimate. Neither is it a series of quibbles about the fossil record or biochemistry; indeed, ID's central concern is not really biology. The grand themes of ID center on the nature of intelligence and creativity.

In the top-down, hierarchical view of reality shared by ID proponents and most Muslim thinkers, intelligence must not be reducible to a natural phenomenon, explainable in conventional scientific terms. As John G. West, Jr., (2001) asserts:

Intelligent design . . . suggests that mind precedes matter and that intelligence is an irreducible property just like matter. This opens the door to an effective alternative to materialistic reductionism. If intelligence itself is an irreducible property, then it is improper to try to reduce mind to matter. Mind can only be explained in terms of itself—like matter is explained in terms of itself. In short, intelligent design opens the door to a theory of a nonmaterial soul that can be defended within the bounds of science. (66)

Accordingly, ID attempts to establish design as a “fundamental mode of scientific explanation on a par with chance and necessity”—as with Aristotle’s final causes (Dembski 2001b, 174).

Intelligence, of course, is manifested in creativity. ID proponents believe that the intricate, complex structures that excite our sense of wonder must be the signatures of creative intelligence. The meaningful information in the world must derive from intelligent sources. The efforts of mathematician and philosopher William Dembski (1998b, 1999), the leading theorist of ID, have been geared toward capturing this intuition that information must be something special, beyond chance and necessity.

The western ID movement has few Muslim connections. Among Muslims involved with ID, the most notable is Muzaffar Iqbal, a fellow of the International Society for Complexity, Information, and Design, a leading ID organization. Iqbal is also part of the Center for Islam and Science, a group of Muslim intellectuals promoting “Islamic science.” But the connection is deeper than minimal organizational contact. The grand themes of ID resonate with a Muslim audience: they are found in much Muslim writing about evolution and how *manawi* (spiritual) reality creatively shapes the *maddi* (material). This is no surprise, because these themes are deeply rooted in any culture touched by near-eastern monotheism. They have not only popular appeal but the backing of sophisticated philosophical traditions developed over millennia.

Today, a full-blown defense of these themes must include a critique of modern biology. After all, while life, with its wondrous functional complexity, was once the poster child for the argument from design, it has now become the prime illustration of how to explain nature through chance and necessity. Evolution in the minimal sense of descent with modification could

be accommodated if it could be seen as a progression toward higher orders of being; indeed, such was the initial response of even evangelical theologians to Darwin (Livingstone 1987). Interpreting evolution as an explicitly guided development would retain a sense of intelligent design; and this approach is still alive among more liberal thinkers, both Christian and Muslim. Darwinian biology, however, strains this view since it relies on nothing but blind mechanisms with no intrinsic directionality. The main sticking point is not descent with modification or progress but *mechanism*: chance and necessity suffice; hence, design as a fundamental principle disappears.

Defenders of intelligent design, then, understandably feel a need to pick a quarrel with Darwinian evolution. In the Muslim world, this task is more straightforward because a generic philosophical version of ID is part of the intellectual background. This is no longer the case in western intellectual life. The ID movement here is attempting to regain a foothold in the intellectual culture. To do so, proponents need to flesh out their intuitions about design and put them into play as scientific explanations. Thus, it is westerners, not Muslims, who invent notions of irreducible complexity in molecular biology (Behe 1996) and try to formulate mathematical tests to show that information is something special, beyond mere mechanisms, and a signature of design (Dembski 1998b).

ID among the Theologians

ID involves philosophy and theology, as well as attempts at science, and the grand themes it tries to defend might seem more at home in theology than in science. Indeed, the movement has attracted a number of philosophers and theologians with conservative religious commitments: Alvin Plantinga, Stephen C. Meyer, J. P. Moreland, William A. Dembski, William Lane Craig, Robert C. Koons, Jay Wesley Richards, John Mark Reynolds, Paul A. Nelson, Bruce L. Gordon, and no doubt many others (Moreland 1994, Dembski 1998a, Dembski and Kushiner 2001).

Academic theology in general, however, has a more liberal bent; it is not inclined to challenge mainstream science. Even so, we might expect some of ID's concerns and themes to surface in the west. After all, its central concerns do not involve minor sectarian points of doctrine but notions of divine design that should have a broad appeal.

Some echoes of ID's preoccupations can, in fact, be found in the writings of theological liberals who are friendly toward evolution. John F. Haught (2003), who vigorously defends the view that modern biology is fully compatible with Christianity and criticizes the ID movement for its theological

lack of depth, nevertheless believes that creative novelty cannot be captured by mere mechanism, by chance and necessity. Like ID proponents, he takes information to be a key concept, describing God as “the ultimate source of the novel informational patterns available to evolution” (Haught 2000, 73). Another well-known example comes from the work of John Polkinghorne (1998) and Arthur Peacocke (1986), who speculate about how the indeterminism in modern physics might allow us to speak of a top-down sort of causality, beyond chance and necessity, which is connected to “active information” and allows intelligent guidance of evolution.

Curiously, academic theologians are often more willing to defend ID-like ideas outside the context of biological evolution. For example, some religious thinkers are enamored of parapsychology, which gets scarcely more respect than ID does in scientific circles. Accepting the reality of psychic powers, they see evidence that mind is independent of matter, that “agent causation” is an irreducible category of explanation very similar to design as ID proponents conceive of it (Stoeber and Meynell 1996).

It is notable, though, that such echoes of ID are merely echoes; only someone looking for parallels would notice them. These ideas seem to come up independently of the ID movement, appearing without favorable citation of any ID figure. Moreover, the echoes remain wholly undeveloped and tentative. For example, Polkinghorne never advances his speculations about information and quantum randomness as a space for divine action. Doing so would mean making the strong claim that the randomness in modern physics is not truly random and that a pattern might be revealed, perhaps brought to light by a design argument. Rather, he leaves his ideas at the “could be that” stage, never directly engaging science.

This brings up an intriguing possibility: that ID can be a means of bridging the gulf separating conservative and liberal theologies. Conservatives suffer from a reputation for intellectual backwardness, liberals from the impression that they are too accommodating, too given to compatible-with-anything hand waving. ID might provide conservatives with sophistication and liberals with a more-solid formulation for their intuition. This does not even necessitate a complete denial of evolution. After all, the grand themes of ID do not require that descent with modification be false, just that mere mechanisms not be up to the task of assembling functional complexity. Technically, Dembski’s theories of ID do not require divine intervention all the time. The information revealed in evolution could have been injected into the universe through its initial conditions and then left to unfold (Edis 2001). So there is at least the possibility of some common ground.

But of course, liberals and conservatives have not come closer. The ID

movement remains theologically conservative and harbors a deep distrust of descent with modification, not only of Darwinian mechanisms. Dembski (2002b, 212) has made a few half-hearted statements to the effect that even if modern biology remains intact, his work will show that an intelligent designer is the source of all genuine creativity. It is unlikely, however, that the ID movement will take this direction.

On their part, liberal religious thinkers about evolution usually do not treat ID as a religious option worth exploring. One exception is Warren A. Nord (1999), who has included ID among the intellectually substantive approaches he thinks biology education should acknowledge alongside a Darwinian view:

Yes, religious liberals have accepted evolution pretty much from the time Charles Darwin proposed it, but in contrast to Darwin many of them believe that evolution is purposeful and that nature has a spiritual dimension. . . . Biology texts and the national science standards both ignore not only fundamentalist creationism but also those more liberal religious ways of interpreting evolution found in process theology, creation spirituality, intelligent-design theory and much feminist and postmodern theology. (712)

Such acknowledgment of ID is notably rare. It has more to do with Nord's (1995) long-standing insistence that more religion should be incorporated into public teaching than with his acceptance of ID in academic theology.

No doubt, this lack of contact largely reflects a cultural split. Liberal religion not only adapts to the modern world but is, in many ways, a driving force behind modernity. It has embraced modern intellectual life and ended up much better represented in academia than among the churchgoing public. By and large, it has been friendly to science, preferring to assert compatibility between science and a religious vision mainly concerned with moral progress. One result has been a theological climate in which the idea of direct divine intervention in the world, in the way that ID proponents envision, seems extremely distasteful.

The debate over ID easily falls into well-established patterns. ID arose from a conservative background, and conservatives remain its constituency. Its perceived attack on science triggers the accustomed political alignments already in place during the battle over old-fashioned creationism, when liberal theologians were the most reliable allies of mainstream science. What is at stake in this battle is not so much scientific theory as the success of rival political theologies and competing moral visions.

But if science is almost incidental to the larger cultural struggle, it is still

crucial to how ID is perceived. In our culture, science enjoys a good deal of authority in describing the world; therefore, ID must present a scientific appearance. Although liberal religious thought has been influenced by postmodern fashions in the humanities and social sciences, resulting in some disillusionment with science, liberals still usually seek compatibility with science rather than confrontation.

So what scientists think of ID is most important for its prospects, more important than its fortunes in the world of philosophy and theology. ID has appealed only to a narrow intellectual constituency mainly because it thus far seems to be a scientific failure.

ID and the Scientists

The reaction of the scientific community to ID has been decidedly negative. Like many advocates of ideas out of the mainstream, ID proponents are given to suspect that their rejection has more to do with prejudice than with a fair consideration of merit. This suspicion is especially strong since ID has religious overtones, no matter how neutrally they come packaged. After all, it has long been conventional wisdom that science and religion have separate spheres and that scientists do not look kindly upon religious encroachment on their territory.

This is not to say that scientists are biased against religion. In fact, although there is considerable skepticism among scientific elites (Larson and Witham 1998), workers in scientific fields are not hugely different from the general population in their religious beliefs (Stark and Finke 2000, 52–55). Nevertheless, there may be institutional barriers to the fair consideration of scientific claims with religious connotations.

Such suspicions within the ID movement are reinforced when the first defense of evolution they encounter is that their ideas are intrinsically unscientific—that science cannot even properly consider non-naturalistic claims such as ID, let alone accept them. Therefore, much of the philosophical effort behind ID has been devoted to defeating this presumption of methodological naturalism (Pennock 1996). Reading methodological naturalism as a strict requirement for doing science is, in fact, overly strong. The philosophy of science is littered with failed attempts to define an essence of science, separating legitimate hypotheses from those that fall beyond the pale. At any one time, a list of such requirements—naturalism, repeatability, and so on—might appear plausible. If so, it is because they are abstracted from successful practice, not because they are inevitable requirements of some disembodied Rea-

son. Such principles may even inspire a research program, but like behaviorism in psychology, which countenanced only the directly observable, they can fail.

Confining science to naturalistic hypotheses would also be historically strange. Biologists of Darwin's day, for example, compared evolution to special creation as rival explanations and argued that evolution was superior, not that creation should never have been brought up. Even today, explanations in terms of the intentions and designs of persons are legitimately part of historical or archaeological work. Today's state of knowledge might incline us to think such agent-causation is eventually reducible to chance and necessity, but we need not assume this is so in order to do science.

ID philosophers bring up many such objections, and they are largely correct. Methodological naturalism cannot be used as an ID-stopper. If it is to fail, ID should be allowed to fail as a scientific proposal. On the other hand, naturalism may still make sense as a methodology, justified not by philosophical fiat but by historical experience.

Consider an astrophysicist studying distant galaxies. She will, in constructing her theories, assume that physics is the same out there as it is here: that the same sort of particles interact in the same way we observe them to do close to home, that gravity does not suddenly act by an inverse-cube law outside our galaxy. This does not mean that the only legitimate astrophysical hypotheses follow this assumption. After all, in certain ways, such as the presence of life, our corner of the universe may well be unrepresentative. Not too many centuries ago, our physics was Aristotelian: the sublunar realm was supposed to behave in ways radically different from what took place in the spheres beyond the moon. Assuming the same physics throughout the universe, however, has been successful in recent history, and no current rivals promise better explanations. Assuming that physics is the same is our best bet, likely keeping us from wasting time on fruitless research. Similarly, preferring naturalistic theories makes the best sense in light of our successful experience with theories such as evolution (Richter 2002).

This does not mean that ID is disallowed. It means that ID is a very ambitious claim and that it must produce strong evidence before scientists go along with the proposed revolution. Success for ID should be difficult, but not out of reach.

Is the scientific community open to such evidence? The answer has to be a qualified yes. Scientists are often conservative, resistant to changing their theories; practical methodologies may well harden into blinders over time. But scientists also need new ideas to advance their work, and they do not pay much

attention to the lists that philosophers make to define science. Even if methodological naturalism is the reigning conventional wisdom, it is not absolute dogma, and ID can still reach a scientific audience.

One important way for unorthodox ideas to gain a hearing is through scientific criticism. It does not greatly matter if the critics are initially hostile. To avoid embarrassment, if for no other reason, critics must at least understand the unfamiliar ideas and learn to work with them. Otherwise, an adequate job of criticism will not be possible. This learning process has historically been important in the acceptance of many revolutionary views, including Darwinian evolution itself (Thagard 1992). Critics can become converts.

Another way might be for a few scientists, perhaps those who are young and less committed to evolution than their elders, to take their chances with ID. If they can succeed with research driven by an ID perspective, consistently producing results that are surprising from an evolutionary standpoint, ID will suddenly be taken much more seriously.

But ID does not seem to be moving forward at all in the scientific world. It does not lack serious critics who are willing to engage with its claims in technical detail. Far from being converted, the critics consistently find ID's claims to be disappointing. Its most significant biological effort has been Michael Behe's argument for irreducible complexity, which turned out to be very poor work, not to mention current progress on the very problems Behe had said were not being addressed from a Darwinian viewpoint and could not be (Miller 1999, Shanks and Joplin 1999). William Dembski, ID's wunderkind in information theory, produced work that might eventually contribute to detecting an interesting type of complex order, but it has no bearing on the truth of Darwinian evolution (Edis 2001). Since then, Dembski has been busy misapplying certain mathematical ideas to prove that the Darwinian mechanism cannot be truly creative (Rosenhouse 2002).

The young Turks who might do novel research based on ID also have not materialized. This is not to say the biology departments of American universities are devoid of the occasional faculty member with ID sympathies. Not a few must have prior religious commitments that incline them toward ID. But productive, surprising research *driven by ID* is noticeably absent.

ID might one day make its big push. Perhaps it is too early, and ID's research ideas have not been fully developed yet. Perhaps. But so far ID has been singularly unproductive, and nothing about it inspires confidence that things will change. It is no wonder that ID gets no respect from the scientific community.

Politics, Again

With its ambitions to be the intellectually sophisticated opposition to Darwinian evolution, ID has failed to make headway among intellectual elites. But it has the solid support of a popular religious movement, the same constituency that supported old-fashioned creationism. Understandably, ID proponents have been trying to play to their strength. The movement today looks more like an interest group trying to find political muscle than a group of intellectuals defending a minority opinion. Like their creationist ancestors, they continually make demands on education policy. Similarly, their arguments against evolution do not build a coherent alternative view but collect alleged “failures of Darwinism.”

Unfortunately for ID, there is no crisis in Darwinian evolution. Its vitality can be judged best by observing not only its nearly universal acceptance in biology but the way in which Darwinian thinking has come to influence other disciplines. From speculations in physical cosmology (Smolin 1997) to influential hypotheses in our contemporary sciences of the mind, variation-and-selection arguments have come to bear on many examples of complex order in our world. To some, this suggests a universal Darwinism that undermines all top-down, spiritual descriptions of our world (Dennett 1995, Edis 2002), while others argue that the Darwinian view of life is no threat to liberal religion (Ruse 2001, Rolston 1999).

ID, however, is not part of this debate. Darwinian ideas spilling out of biology can only confirm the suspicions of ID proponents that Darwinism is not just innocent science but a materialist philosophy out to erase all perceptions of direct divine action from our intellectual culture. So they have plenty of motivation to continue the good fight. In the immediate future, however, the fight will not primarily involve scientific debate or even a wider philosophical discussion but an ugly political struggle.