

# DEMBSKI, DARWIN AND DEVILS

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Reviews of *The Design Revolution* by William Dembski, InterVarsity Press, Downer's Grove, Illinois., 2004, 334 Pages; *God, the Devil and Darwin*, by Niall Shanks, Oxford University Press, New York, NY, 2004, 273 Pages; and *Darwinism, Design, and Public Education* by John A. Campbell and Stephen Meyer, Michigan State University Press, East Lansing, MI, 2003, 634 Pages.

## 1. THE DESIGN REVOLUTION

Since William Dembski's latest book is subtitled "Answering the Toughest Questions About Intelligent Design", the naive reader might think that he has taken seriously the numerous criticisms leveled at his ideas. More experienced readers will be unsurprised to learn that Dembski mostly just repeats the same fallacious arguments he has always made. None of the major criticisms of his work is adequately addressed. After briefly summarizing his ideas for detecting design in natural phenomena, I will discuss two of the most fundamental difficulties with his work.

Dembski's primary contributions to evolution-denial are his ponderous, repetitive musings about complex, specified information (CSI). It is his assertion that if you find CSI in some physical structure, you can be sure that lurking somewhere in its causal history is an intelligent designer. He further asserts that animals are replete with instances of CSI, implying they did not emerge from natural processes alone.

Dembski's term "information" refers to some event or phenomenon. "Complex" then indicates the probability of the event occurring by natural causes alone is small, while "specified" means the event embodies some pattern describable without reference to the structure itself. In its application to biology, the events Dembski envisions are certain complex, biomolecular machines.

The idea is that the particular sequence of heads and tails that emerges when a fair coin is flipped one thousand times is highly improbable, but this by itself does not make us suspicious. But if the

sequence consists of one thousand heads, we now have a pattern that is both complex and specified. Consequently, we suspect there is skull-duggery afoot.

There is nothing more to Dembski's work than that, a fact that is easily overlooked when slogging through his excessively technical scribblings.

## 2. PROBABILITY CALCULATIONS

How are we to carry out an appropriate probability calculation for events whose occurrence is influenced by more variables than we can plausibly measure? Such calculations begin with an enumeration of all the events that might have occurred in lieu of the one we are considering. We then assign a probability to each of those outcomes, which in any nontrivial, real-life case is likely to require far more information than we have. The problem is especially acute when the events we are considering are the endpoints of four billion years of evolution.

Dembski is aware of this problem. He writes:

The argument starts by noting that if some natural system exemplifies specified complexity, then it must be vastly improbable with respect to all purely natural mechanisms that could be operating to produce it. But that means calculating a probability for each such mechanism. This, so the argument runs, is an impossible task. At best science could show that a given natural system is vastly improbable with respect to known mechanisms operating in known ways and for which the probability can be estimated. But this omits, first, known mechanisms operating in unknown ways and for which the probability cannot be estimated; second, known mechanisms for which the probability cannot be estimated; and third, unknown mechanisms. (P. 110).

Well said. It's the second of the three omissions that is most serious. Biologists say that complex systems evolve gradually as a result of natural selection. That is a known mechanism, but one whose effects are too complicated to be captured in a simple probability calculation.

Dembski has exactly one card to play in circumventing this objection: The irreducible complexity (IC) of certain biochemical systems. IC is the brainchild of Michael Behe, who coined the term in his 1996 book *Darwin's Black Box*. A system is IC if it is composed of several, well-matched, indispensable parts. Behe and Dembski argue it is implausible that such systems could evolve gradually. Though Dembski

claims to have a general procedure for detecting design in events whose causal history is unknown, in practice he only applies it to biology. He has a few stock examples for illustrating his ideas, but it is only in biology that Dembski presumes to resolve questions of scientific interest. IC is essential for this purpose, because he must preclude the possibility that complex biochemical systems form gradually through natural selection.

Which means that Dembski's entire body of work on complex specified information, amounting to thousands of pages, contributes absolutely nothing to the evolution/creation debate. In the end, the whole argument comes down to the legitimacy of Behe's claims about IC. If Behe's premise is granted (something no competent biologist is likely to do), then no dubious probability calculation is needed to conclude that evolution as we know it is in trouble. If it is not granted, then the assumptions underlying Dembski's probability calculations are plainly false.

Dembski asserts that, as a matter of logic, IC systems cannot evolve directly. He writes:

The logical point is this: Certain artificial structures are provably inaccessible to a *direct* Darwinian pathway because they have property *P* (i.e. irreducible complexity). But certain biological structures have property *P*, so they too must be inaccessible to a direct Darwinian pathway. (P. 293. Emphasis in original).

Here is his definition of "direct Darwinian pathway":

A direct Darwinian pathway is one in which a system evolves by natural selection, incrementally enhancing a given function. As the system evolves, the function does not. (P. 293)

Of course, this says nothing about indirect pathways, which biologists believe are quite common in evolution. Dembski dismisses this possibility, but does so only by downplaying the vast literature addressing biochemical evolution. For a large number of biochemical systems there is quite a lot known about their evolution.

More to the point, however, is that IC does not preclude direct Darwinian pathways. That every part of a machine is currently essential does not imply that it has always been essential. Behe ignored this possibility in *Darwin's Black Box*. Dembski tries to evade it by introducing the notion of "minimal complexity (MC)," by which he means that no system less complex than the minimum could perform the function of

the full machine. In this formulation it is the combination of IC and MC that rule out direct Darwinian pathways.

The problem is that a complex system does not evolve in a vacuum. Rather, its environment evolves along with it. A system may be MC in its present environment, but not be MC in some ancestral environment. Put another way, a simpler system might have been functional in a simpler environment. But including this possibility would make it impossible to apply the concept of MC.

As an example, consider the scenario for blood clotting evolution described by Russell Doolittle and others. Every step in its formation was useful for the purpose of blood clotting. This is possible because the nature of the circulatory system in which the system was operating changed over time. The earliest stages of the cascade formed in an ancient invertebrate with a low-pressure circulatory system. Consequently, the organism could get by with a relatively slow and primitive clotting mechanism. Our modern blood clotting system evolved in tandem with changes in the circulatory system.

Consequently, IC is utterly irrelevant to any question of biological significance.

### 3. SPECIFICITY

Low probability by itself does not preclude chance as an explanation for an event. To infer design we need something else, and Dembski offers specification for that purpose.

The idea is that the event in question should conform to some identifiable pattern. Dembski has offered elaborate statistical justifications for knowing the genuine patterns from the ones imposed by human imagination, but we will lose nothing by ignoring these details. To justify the claim that the bacterial flagellum (the only biological system Dembski considers) is specified, he writes:

Certainly the bacterial flagellum is specified. One way to see this is to note that humans developed bi-directional motor-driven propellers well before they figured out that the flagellum was such a machine. This is not to say that for the biological function of a system to constitute a specification, humans must have independently invented a system that performs the same function. Nevertheless, independent invention makes all the more clear that the system satisfies independent functional requirements and therefore is specified. At any rate, no biologist I know

questions whether the functional systems that arise in biology are specified. (P. 111)

I love that last line. Since there are, at present, no biologists at all who use the term “specified” in the peculiar technical sense Dembski envisions, I suspect he is right. Apparently specifying the bacterial flagellum only requires making an analogy between the manner in which it performs its function and some human invention that serves a similar purpose. Nothing technical there. If this is different from looking at a cumulus cloud and seeing a dragon, I do not see how.

In illustrating his ideas about specification, Dembski frequently makes reference to Mt. Rushmore. Any particular pattern of cracks and ridges in a mountain is terribly improbable, but the faces on Mt Rushmore fit a clear specification. It is this combination of complexity and specification that leads us to design, he claims.

Left out of this analysis, alas, is our knowledge of what mountains look like when human designers do not carve faces into them. Similarly, when we note that a coin has come up heads one thousand times in a row and infer that trickery is afoot, we base that conclusion on our experience of tossing coins and obtaining some random collections of head and tails. But this experience is precisely what is lacking when considering specifications of biological systems. At issue here are the forms into which DNA arranges itself in the course of billions of years of evolution. We have no past experience on which to draw in distinguishing the genuine patterns, the ones that make us suspect design, from the phony patterns that are products of our imaginations.

We do know that experiments in artificial life have shown irreducibly complex structures form routinely via processes of random variation and selection. We also know that natural selection will favor the small percentage of gene combinations that aid an organism in its quest for survival. These considerations suggest that the bacterial flagellum is improbable in the same way the outcome of our multiple coin-tossing experiment was improbable, and not in the way the faces on Mt. Rushmore are improbable.

#### 4. CONCLUSION

Far more than his previous books, the present volume considers questions of philosophical and theological interest. His treatments of these topics are as deficient as his arguments about science, but I shall not consider them here.

This book does not exist to elevate the scientific status of ID, an impossible task given the false assumptions and sloppy reasoning upon

which it is based. Rather, it exists solely to convince nonscientists that ID is alive and kicking.

And therein lies reason for optimism. ID proponents are making almost precisely the same arguments today they were making a decade ago. They have produced no new facts or arguments to bolster their claims. Instead, they publish increasingly strident rhetoric and push back the date when ID will finally triumph over evolution. What better evidence can there be of the sterility of ID as a scientific enterprise?

## 5. GOD, THE DEVIL, AND DARWIN

In replying to Dembski's assertions about IC I tacitly assumed that in explaining the formation of complex systems we are forced to choose between intelligent-design and natural selection. As Niall Shanks points out in *God, The Devil, and Darwin*, there is a third option:

the recent study of nonequilibrium thermodynamics has revealed how natural mechanisms, operating in accord with natural laws, can result in the phenomenon of self-organization, whereby physical systems organize themselves into complex, highly ordered states. In addition to evolutionary mechanisms studied by biologists, there are thus other natural sources of ordered complexity operating in the universe. A person ignorant of such mechanisms might well conclude that supernatural causes are in operation where there are in fact none. (P. 15 – 16)

He subsequently demonstrates that self-organization is a threat to both Dembski and Behe. His discussion of this topic is augmented by an explanation of basic thermodynamics that is clear and eloquent.

Dembski and Shanks both hold doctorates in philosophy, but that is where the similarities between them end. The main purpose of Dembski's writing is to bamboozle nonscientists into thinking he has produced something profound. Shanks, by contrast, brings clarity to confusing issues. Though I have been actively engaged in evolution/ID disputes for several years, I found myself learning a great deal from his book.

Shanks traces the history of the design argument, starting with Aristotle and paying close attention to the work of early Christian scholars. Especially interesting is his discussion of how advances in technology and medicine during the seventeenth and eighteenth centuries led to "machine thinking" in biology. Organisms were likened to machines, and just as machines require designers, so also do organisms. During

this time scientific discoveries, far from challenging the design argument, actually strengthened it. Darwin changed all that. By explaining the complex adaptations of animals in terms of blind, material forces, he cut the legs out from under the design argument. Shanks' discussion of these issues is compelling. The inclusion of this material not only provides context for the modern debates, but also assures that the book will be of interest to people already steeped in the intricacies, and fallacies, of modern design arguments.

The remainder of the book is devoted mostly to thermodynamics and self-organization. There is also a fine chapter on science and the supernatural. Especially noteworthy here is Shanks' discussion of recent studies purporting to show the efficacy of prayer as a medical treatment. These studies merit treatment in a book devoted to evolution and ID because

independently of whether they are flawed or not, they represent serious attempts to gather evidence in favor of supernatural conclusions (attempts that are simply not in evidence in the intelligent design movement, which has contented itself with extensive armchair theorizing). (P. 17)

He provides ample reason to be suspicious of the outcomes of these experiments.

The discussion of this issue is in the context of ID bellyaching about the alleged pernicious influence of naturalism. Shanks provides an admirably clear explanation of the role naturalism plays in modern science. He points out that scientists are suspicious of the supernatural not because of an arbitrary naturalistic bias, but because it has never once happened that supernatural hypotheses have led to scientific progress. In a better world this point would be obvious to everyone. Alas, the combination of extensive ID bloviation with public ignorance of science has rendered it obscure.

In the end, I cannot improve on Shanks' blunt conclusion about the difficulties with ID:

The central stumbling blocks for intelligent design theory actually have little to do with pernicious materialistic philosophies alleged to be held by its opponents. The central stumbling blocks are all evidential in nature. The accusation that scientists reject intelligent design theory because they are in the sway of materialistic or naturalistic philosophy is part of a smoke-and-mirrors strategy to cover this sad reality from public scrutiny. (P. 139)

You could fill a book twice as long as the one Shanks has written cataloging all of the deficiencies in ID science. Happily, Shanks has struck an admirable balance between thoroughness and breadth. Rather than give short shrift to a large number of anti-ID arguments, he has chosen to develop a few arguments carefully. It was a wise editorial decision, and I heartily recommend his book.

## 6. ID IN THE SCHOOLS?

There are twenty-six essays in the anthology *Darwinism, Design and Public Education*, edited by John Angus Campbell and Stephen Meyer. Many of them have already been published in other venues, but there is no mention of that fact in the book. The majority of the essays parrot the usual ID talking points, and they do not merit review. However, the book also addresses educational issues, and contains a handful of essays critical of ID.

The first question to ask is whether it is constitutional to teach ID in science classrooms. Regrettably, the scientific merits of ID are not directly relevant to addressing its constitutionality; the constitution, after all, does not prohibit teaching bad science. The legal questions are difficult and subtle, and I will not address them here.

In his contribution, philosopher Warren Nord offers a different take on the constitutionality issue. He argues it is unconstitutional not to teach ID. He bases his argument on the idea of religious neutrality:

There is no such thing as a neutral point of view. The only way to be neutral, when all ground is contested ground, is to be fair to the alternatives, taking everyone seriously. That is, given the Court's long-standing interpretation of the Establishment Clause, it is mandatory for public schools to require the study of religion if they require the study of disciplines that cumulatively lead to a "pervasive devotion to the secular" - as they do. (P. 49)

Nord's ideas have some peculiar consequences. No doubt we should take seriously the viewpoint of the Ku Klux Klan when discussing Martin Luther King. The simple fact is that there are a lot of dopey, harmful worldviews out there. Not only is it impractical to accord equal weight to all of them, it is dangerous as well. Also, it is highly debatable whether science education really does lead to a "pervasive devotion to the secular."

Nord's belief that the constitution requires the teaching of religion flies in the face of several court decisions. For example, in the case



*Edwards v. Aguillard*, the Supreme Court ruled that it was unconstitutional to require the teaching of creation science alongside evolution. The law in question there provided a detailed outline of young-Earth creationism, a view held by a large segment of the U.S. population. That seems to be a blow to Nord's view of things.

He goes on to write:

What is constitutionally required? Well, if students are to think critically, if schools are to treat different cultural traditions with respect, if education is to be religiously neutral, then, when we disagree, as we do about the relationship of religion and science, students should learn about the nature of the disagreement; they should hear the contending voices; they should be taught the conflicts. (p. 51)

If you feel tempted to point out that science classes do not generally address the relationship of religion and science at all, rest assured that Nord has anticipated you:

The purpose of high school science courses should not be to train scientists but to educate students by initiating them into our ongoing cultural conversation about how to make sense of the world. Science texts do not now convey to students anything of the controversial nature of this conversation. We typically teach science as one more disciplinary monologue that students must listen to uncritically. By refusing to take seriously contending interpretations of nature we teach science, in effect, as a matter of authority, and students typically come to accept the claims of science as a matter of faith in the scientific tradition rather than of critical reason. (P. 51-52)

Of course, the purpose of high school science classes should be to teach students about the methods and findings of science. Those methods and findings are entirely independent of any cultural conversation Nord imagines we are having. Furthermore, ID proponents are adamant in claiming that they have no interest in bringing religious ideas into the science classroom. Instead, their rallying cry is to teach alleged scientific evidence against evolution alongside the evidence for it.

The argument that teaching ID is constitutionally required seems like a loser. A better tactic is to argue it is good pedagogy to teach ID

along with evolution. Representative of the arguments in favor of this view are found in Campbell's own contribution.

He begins by noting that in every chapter of *The Origin of Species* Darwin showed how evolution provided a better explanation for the facts of natural history than design. This suggests that evolution is more easily understood when it is set in opposition to the competing notion of ID:

It follows from our previous discussion that in order to understand Darwin's argument, to say nothing of the contemporary controversy that it continues to generate, students need to understand Darwinism's dialectical opposite: the intelligent design hypothesis. (P. 15)

The problem here is an equivocation in the use of the term "intelligent design hypothesis." Darwin placed evolution in opposition to the idea that species are fixed, but that is not the view modern ID proponents defend. The assumption of species fixity leads to different predictive consequences than the assumption that they change through time. By contrast, modern ID theory has no predictive consequences that we might use in comparing it to evolution. Students will not understand evolution better for having heard that Michael Behe demurs.

Campbell also argues that it is dishonest to pretend that evolution does not have profound religious and moral consequences:

Militant atheism is an overt and inescapable inference of the evolutionist case as set forth by many of evolution's most distinguished public defenders. Those who recommend temporizing positions are met, at best, by "mild amusement" from their peers. To pretend that evolutionary science, as understood by the vast majority of its most accomplished advocates, is religiously neutral will advance neither the public understanding of science nor the public discussion of the values and assumptions that inevitably inform its teaching. (P. 24)

He cites people like Richard Dawkins and Daniel Dennett in defense of this view. Actually, though, it is only creationists who believe that atheism, militant or otherwise, "is an inescapable inference of the evolutionist case." Evolution dispenses with the idea that all modern species emerged in a puff of smoke with one waggle of God's finger. It says nothing about whether there is an intelligence lurking behind the fundamental structure of the universe. Dawkins and Dennett would not dispute this claim.

Many popularizers of evolution are indeed atheists, a fact they are not bashful about revealing in their work. Michael Ruse offers the best response to this in his own contribution to the anthology:

You can separate out science from nonscience. Professional Darwinism is science, and intelligent design theory is not. Popular Darwinism is value impregnated. It is a form of secular religion in many respects. Professional Darwinism is not value impregnated. It is straight science. Evolution should be taught in biology classes, and intelligent design theory should not be taught. But science and only science should be taught in science classes, and popular Darwinism has no more place there than creationism. (P. 484)

The book's final section, entitled "Critical Responses", is the most disappointing. It seems that the contributors here were chosen carefully. Included are ID boosters Alvin Plantinga and Phillip Johnson. Johnson criticizes nothing presented in the book's earlier essays, making his inclusion truly bizarre. Plantinga, meanwhile, is only critical of the idea that evolution should be taught at all. Also included is an essay by Brig Klyce and Chandra Wickramasinghe defending panspermia (and incidentally rejecting the Big Bang). More than a page of this five-page essay resides under the heading "Creationists are Right to Question Darwinism." (In fairness, the next section is titled "Darwinists are right to Defend Science").

Only a few of the essays, most notably the contributions from philosopher, Michael Ruse, biologist Massimo Pigliucci, and biochemist Bruce Weber, are sensible and worth reading. Most of the rest include so many caveats and concessions that their criticisms of ID get lost. Consider this statement, from David Depew, a professor of communication studies at the University of Iowa:

I could not agree more with the claim that contemporary Darwinism lacks models that can explain the evolution of cellular pathways and the problem of the origin of life. Meyer is correct to point out, for example, as my coauthor Bruce Weber and I have also done, that natural selection cannot in principle be the cause of life's origin. Natural selection is a phenomenon that depends for its operation on the very sort of variation and heredity that exists only in organisms and so can hardly be used to explain how organisms came into existence in the first place.

Nor does Meyer miss the mark when he derides writers such as Francis Crick, Jacques Monod, and Dawkins, who appeal to sheer accident (including, in Crick's case, extraterrestrial intrusion) to explain the origin of life. That is no explanation at all. It is a confession of failure. In the face of the growing urgency of these problems, the inclinations of some Darwinian apologists to retreat to the high ground of metaphysical materialism can readily, and perhaps justly, be understood by hostile critics as an attempt, in the face of such inadequacies, to issue a philosophical guarantee that, in the absence of empirical proof, life will eventually be shown to be consistent with received Darwinian thought. But this is not science. It is scientistic ideology. (P. 448-449).

This from an essay entitled "Intelligent Design and Irreducible Complexity: A Rejoinder". Some rejoinder. Almost every sentence in these two paragraphs is false.

Darwinism has nothing to do with the origin of life. The sort of heredity and variation on which natural selection depends exists not just in organisms, but also in certain sorts of molecules (not to mention viruses). This leads to the idea of "chemical selection", which is highly relevant in understanding the origin of life. No one, not Crick, not Monod, not Dawkins, offers "sheer accident" as an explanation of life's origin. Panspermia is not an attempt to explain the origin of life. Rather, it is a hypothesis about how life came to reside on Earth. And who, exactly, are the Darwinian apologists who are retreating from anything offered by ID proponents?

There are educational questions surrounding ID that have little to do with the merits of ID as science. Campbell and Meyer might have put together an interesting anthology exploring all sides of these issues. They opted instead to put together yet another volume of ID propaganda. That is unfortunate, but unsurprising.

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