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BOOK REVIEWS

No Free Lunch: Why Specified Complexity Cannot Be Purchased Without Intelligence by William A. Dembski. Lanham, MD: Rowan and Littlefield, 2002. 404 pp., including illustrations. $35.00 (hardback). ISBN 0-7425-1297-5.

Biology is the study of complicated things that give the appearance of having been designed for a purpose.

—Richard Dawkins

No Free Lunch: Why Specified Complexity Cannot Be Purchased Without Intelligence is William Dembski's most recent book promoting "intelligent design" (ID). Dembski, one of the leaders of the ID movement, is a philosopher and mathematician. When I read some of the promotional materials associated with *No Free Lunch* (e.g., that it "devastates the Darwinists"), I was skeptical but intrigued. After reading *No Free Lunch*, however, I was disappointed. Although *No Free Lunch* is one of the best books available about ID, it is not worth buying.

Here's how *No Free Lunch* is organized:

Chapter 1, the most readable chapter of the book, connects Dembski's ideas regarding "design inferences" with Darwinism. If you've already read Dembski's *The Design Inference* (a rather technical discussion of how statistical procedures can allegedly be used to detect design), you're familiar with much of the information in this chapter.

Chapter 2 introduces Dembski's "specified complexity" and discusses why it is useful for inferring design. In short, "specified complexity" occurs when an object is both complex and displays an independently given pattern. For example, a random series of letters is complex but not specific, whereas a series of three letters that spell the word *the* is specific but not complex. A science textbook is both complex and specific. This chapter's problem is that despite Dembski's claims, "specified complexity" is poorly defined, and is therefore poor (if not useless) for inferences about design.

Chapter 3 attempts to link "specified complexity" with information theory while presenting a theoretical framework for Dembski's ideas about complex information. ID is presented as a "theory of information" that detects, measures, and accounts for the origin and flow of information. The chapter concludes with a Fourth Law of Thermodynamics called the Law of Conservation of Information, which governs the flow and origin of information. Dembski claims that because his "specified complexity" cannot come from natural causes, intelligent design is its likely source.

Chapter 4, the climax of the book, discusses Dembski's ideas relative to computational analogues of biological natural selection (i.e., evolutionary algorithms). It is in this chapter that Dembski invokes the "No Free Lunch" mathematical theorems of David Wolpert and William MacReady to claim that neither natural laws nor evolutionary algorithms (nor Darwinian mechanisms of any kind, for that matter) can produce the "complex specified information" that characterizes biological systems. Interestingly, two of the three steps that Dembski attributes to Richard Dawkins' "weasel program" (from Dawkins' *The Blind Watchmaker*) are, in fact, Dembski's; they do not appear in Dawkins' book.

Chapter 5 links Dembski's "specified complexity" to an updated version of Michael Behe's now-discredited "irreducible complexity" and concludes that Behe's criterion of "irreducible complexity" for establishing design is, in fact, a special case of "complexity-specification" for detecting design. Dembski then applies his ideas to the flagella of *Escherichia coli*, a motor that involves 30–50 proteins that must each be in the right place for the flagella to work. Dembski provides an elaborate discussion of the probability for the random appearance of the flagella. Although his "design inference" requires that he generate and eliminate all of the relevant chance hypotheses before concluding that design is involved, Dembski addresses only a camouflaged version of the worn-out anti-evolution "tornado in a junkyard" mantra. No biologist believes that the bacterial flagellum (or any other biological structure) occurs by a purely random combination of components; on the contrary, biologists accept the evidence that these structures evolved by natural selection. It's too bad that Dembski didn't try to apply his ideas to a more well-understood example. (To date, there is no fossil evidence or definitive molecular evidence regarding the origin of bacterial flagella.) I do not see the value of statistical treatments to estimate the appearance of a structure when we can only guess in what conditions and from what the structure developed. A final problem with this chapter is that evolution is not searching for anything. This makes evolutionary algorithms poor analogues for Darwinism and makes it irrelevant that no algorithm beats a blind search for a pre-set goal. That is, it makes no difference if Dembski's calculations are correct; they are simply irrelevant. Evolution has no long-term goal. On the contrary, selection is near-sighted; survival and reproduction are all that matter.

Chapter 6 examines "what intelligent design means for science" while proposing how ID and specified complexity can be used in scientific research. Dembski understands much about the history and philosophy of science, yet claims that intelligent design is a more powerful framework than Darwinism for doing science. Dembski concludes the book by discussing front-loaded versus ongoing interventions of his designer. Dembski's defense of interventions by his designer reveals the ideological and theological origins and biases of ID.

Throughout *No Free Lunch*, Dembski makes clear his beliefs. For example, Dembski claims that 1) ID promises to supersede Darwinism, 2) ID "utterly rejects natural selection as a creative force capable of bringing about the specified complexity we see in organisms," 3) scientists' use of methodological naturalism impedes our understanding of nature, 4) "refusing to countenance the possibility of an unembodied designer impedes scientific inquiry," and 5) his method is infallible. As he claims on p. 24, "I want, then, to argue that specified complexity is a reliable criterion for detecting design. Alternatively, I want to argue that the complexity-specification criterion successfully avoids false positives—in other words, whenever it attributes design, it does so correctly."

No Free Lunch is filled with a variety of false claims, errors, inconsistencies, and weak arguments. For example,

> Dembski claims that one of his "main motivations in writing [*No Free Lunch*] is to free science from arbitrary constraints that . . . stifle inquiry, undermine education, turn scientists into a secular priesthood, and in the end prevent intelligent design from receiving a fair hearing." To what "constraints" does Dembski refer? Testable hypotheses? Explanations based on evidence rather than divine revelation? Like other ID advocates, Dembski proposes no testable hypotheses. Instead, he merely replaces one mystery (an as-yet unexplained aspect of nature) with another mystery (Dembski's "designer").
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> ID advocates argue that the lack of scientific explanations for the origin of all structures (e.g., the bacterial flagellum) must be considered as evidence for ID. Nevertheless, Dembski claims that "design theorists are not arguing from ignorance." Dembski tries to conceal the fact that he is making an argument from ignorance by inserting "specified complexity" as a poorly camouflaged middleman.
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> Dembski claims to detect a designer, but then steps aside. Who? Where? When? How? If, as ID advocates claim, evolution is bad science, what science do they want us to put in its place? Until Dembski and other ID advocates have testable models for what *did* actually happen, all of their claims are merely the newest versions of anti-evolutionism dressed in words such as "specified complexity" and "irreducible complexity."
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> The "No Free Lunch" theorems are not applicable to biological evolution. For example, an organism's reproductive success depends on its interactions with, and the traits of, other individuals in the population. This means that the organism's fitness-function changes over time. This, in turn, violates the "No Free Lunch" theorems' requirement that fitness-functions cannot change in response to the progress of the algorithm.
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> Dembski says nothing about population genetics, a fundamental concept of evolution. Darwinism is sheer demographics; there is no predetermined goal. Evolution is not trying to reach a pre-set target. Why are we to believe that, for

example, a base-sequence of AATCCTAAGGA but not AATCCATTGGA is a "goal" of evolution? *Whose* goal? Why? Similarly, when did Dembski's designer(s) decide to design the *E. coli* flagella? How did the designer(s) do it? By natural laws or with a magic potion and a puff of smoke? Why didn't the designer(s) give flagella to all bacteria?

Because ID cannot be falsified, it has explanations for anything and everything. With no knowledge of the alleged designer, all conceivable explanations are equally probable. Yes, ID advocates sometimes accept naturalistic explanations of natural phenomena (evolution is the not-so-surprising exception). But if the mechanism underlying a natural event or phenomenon is unknown, disliked, or inconsistent with ID advocates' prior beliefs, ID advocates can always justify their preferred answer by playing their trump card: "That's how the Designer did it."

Dembski claims that "intelligent design is not a form of anti-evolution," and, like other creationists, wants ID taught in science classes. Indeed, Dembski claims that "intelligent design is a scientific research program" and that "there can be no principled objection to teaching intelligent design within a science curriculum." He, like many other people, wonders how ID would be taught. After defining ID, what is there to say that is scientific? What designer? When? How? Says who? What's the evidence?

When one invokes a supernatural power such as an unknown designer, you're no longer in the realm of science, even if the general topic is a scientific one (e.g., life's diversity). ID is based on the existence of an unknown designer, but there's no way to test for such a designer; that's why ID is not scientific and doesn't belong in science classrooms. Nevertheless, Dembski claims that intelligent design is an "actual science," believes that "design constitutes a legitimate and fundamental mode of scientific explanation," and urges sympathetic science teachers to teach "an ID-based curriculum."

Dembski wonders "what science will look like once design is readmitted to full academic status." I'm not sure, but it certainly won't look like science.

RANDY MOORE
Professor of Biology
University of Minnesota
128 Pleasant Street SE
Minneapolis, MN 55455

Professor Moore edits The American Biology Teacher *and is the author of the recently published* Evolution in the Courtroom: A Reference Guide (*ABC-CLIO, 2002*).