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Review

Saving Us from Darwin

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BOOKS DISCUSSED IN THIS REVIEW

The Wedge of Truth: Splitting the Foundations of Naturalism
by Phillip E. Johnson
InterVarsity Press, 192 pp., $17.99

Icons of Evolution: Science or Myth? Why Much of What We Teach About Evolution Is Wrong
by Jonathan Wells
Regnery, 338 pp., $27.95

Darwin's Black Box: The Biochemical Challenge to Evolution
by Michael J. Behe
Touchstone, 307 pp., $13.00 (paper)

Mere Creation: Science, Faith and Intelligent Design
edited by William A. Dembski
InterVarsity Press, 475 pp., $24.99 (paper)

Intelligent Design: The Bridge Between Science and Theology
by William A. Dembski
InterVarsity Press, 312 pp., $21.99

Tower of Babel: The Evidence Against the New Creationism
by Robert T. Pennock
Bradford/MIT Press, 429 pp., $18.95 (paper)

Finding Darwin's God: A Scientist's Search for Common Ground Between God and Evolution
by Kenneth R. Miller
Cliff Street Books/HarperCollins,338 pp., $14.00 (paper)

1.

It is no secret that science and religion, once allied in homage to divinely crafted harmonies, have long been growing apart. As the scientific worldview has become more authoritative and self-sufficient, it has loosed a cascade of appalling fears: that the human soul, insofar as it can be said to exist, may be a mortal and broadly comprehensible product of material forces; that the immanent, caring God of the Western monotheisms may never have been more than a fiction devised by members of a species that self-indulgently denies its continuity with the rest of nature; and that our universe may lack any discernible purpose, moral character, or special relation to ourselves. But as those intimations have spread, the retrenchment known as creationism has also gained in strength and has widened its appeal, acquiring recruits and sympathizers among intellectual sophisticates, hard-headed pragmatists, and even some scientists. And so

formidable a political influence is this wave of resistance that some Darwinian thinkers who stand quite apart from it nevertheless feel obliged to placate it with tactful sophistries, lest the cause of evolutionism itself be swept away.

As everyone knows, it was the publication of *The Origin of Species* in 1859 that set off the counterrevolution that eventually congealed into creationism. It isn't immediately obvious, however, why Darwin and not, say, Copernicus, Galileo, or Newton should have been judged the most menacing of would-be deicides. After all, the subsiding of faith might have been foreseeable as soon as the newly remapped sky left no plausible site for heaven. But people are good at living with contradictions, just so long as their self-importance isn't directly insulted. That shock was delivered when Darwin dropped his hint that, as the natural selection of every other species gradually proves its cogency, "much light will be thrown on the origin of man and his history."

By rendering force and motion deducible from laws of physics without reference to the exercise of will, leading scientists of the Renaissance and Enlightenment started to force the activist lord of the universe into early retirement. They did so, however, with reverence for his initial wisdom and benevolence as an engineer. Not so Darwin, who saw at close range the cruelty, the flawed designs, and the prodigal wastefulness of life, capped for him by the death of his daughter Annie. He decided that he would rather forsake his Christian faith than lay all that carnage at God's door. That is why he could apply Charles Lyell's geological uniformitarianism more consistently than did Lyell himself, who still wanted to reserve some scope for intervention from above. And it is also why he was quick to extrapolate fruitfully from Malthus's theory of human population dynamics, for he was already determined to regard all species as subject to the same implacable laws. Indeed, one of his criteria for a sound hypothesis was that it must leave no room for the supernatural. As he wrote to Lyell in 1859, "I would give absolutely nothing for the theory of Natural Selection, if it requires miraculous additions at any one stage of descent."

Darwin's contemporaries saw at once what a heavy blow he was striking against piety. His theory entailed the inference that we are here today not because God reciprocates our love, forgives our sins, and attends to our entreaties but because each of our oceanic and terrestrial foremothers was lucky enough to elude its predators long enough to reproduce. The undignified emergence of humanity from primordial ooze and from a line of apes could hardly be reconciled with the unique creation of man, a fall from grace, and redemption by a person of the godhead dispatched to Earth for that end. If Darwin was right, revealed truth of every kind must be unsanctioned. "With me the horrid doubt always arises," he confessed in a letter, "whether the convictions of man's mind, which has been developed from the mind of the lower animals, are of any value or at all trustworthy. Would any one trust in the convictions of a monkey's mind...?"

In a sentence that is often misconstrued and treated as a scandal, Richard Dawkins has asserted that "Darwin made it possible to be an intellec-tually fulfilled atheist."[1] What he meant was not that Darwinism requires us to disbelieve in God. Rather, if we are already inclined to apprehend the universe in strictly physical terms, the explanatory power of natural selection removes the last obstacle to our doing so. That obstacle was the seemingly irrefutable "argument from design" most famously embodied in William Paley's *Natural Theology* of 1802. By showing in principle that order could arise without an artificer who is more complex than his artifacts, Darwin robbed Paley's argument of its scientific inevitability.

With the subsequent and continually swelling flood of evidence favoring Darwin's paradigm, evolutionism has acquired implications that Darwin himself anticipated but was reluctant to champion. Daniel C. Dennett has trenchantly shown that the Darwinian outlook is potentially a "universal acid" penetrating "all the way down" to the origin of life on Earth and "all the way up" to a satisfyingly materialistic reduction of mind and soul.[2] True enough, natural selection can't tell us how certain organic molecules first affixed themselves to templates for self-duplication and performed their momentous feat. But the theory's success at every later stage has tipped the explanatory balance toward *some* naturalistic account of life's beginning. So, too, competitive pressures now form a more plausible framework than divine action for guessing how the human brain could have acquired consciousness and facilitated cultural productions, not excepting religion

itself. It is this march toward successfully explaining the higher by the lower that renders Darwinian science a threat to theological dogma of all but the blandest kind.

2.

That threat has been felt most keenly by Christian fundamentalists, whose insistence on biblical literalism guarantees them a head-on collision with science. They are the faction responsible for creationism as most people understand the term: the movement to exclude evolution from the public school curriculum and to put "creation science" in its place. The goal of such "young-Earthers" is to convince students that the Bible has been proven exactly right: our planet and its surrounding universe are just six thousand years old, every species was fashioned by God in six literal days, and a worldwide flood later drowned all creatures (even the swimmers) except one mating pair of each kind.

Creation science enjoyed some political success in the 1980s and 1990s, packing a number of school boards and state legislatures with loyalists who then passed anti-Darwinian measures. Clearly, though, the movement is headed nowhere. Its problem isn't the absurdity of its claims but rather their patently question-begging character. "Findings" that derive from Scripture can never pass muster as genuine science, and once their sectarian intent is exposed, they inevitably run up against the constitutional ban on established religion.

But the ludicrous spectacle of young-Earth creation science masks the actual strength of creationism in less doctrinaire guises. According to a recent poll, only 44 percent of our fellow citizens agree with the proposition "Human beings, as we know them today, developed from earlier species of animals." One of the dissenters may be our current president, who went on record, during the Kansas State Board of Education controversy of August 1999, as favoring a curricular balance between Darwinian and creationist ideas. His administration, moreover, is partial to charter schools, public funding of private academies, and a maximum degree of autonomy for local boards. If creationism were to shed its Dogpatch image and take a subtler tack, laying its emphasis not on the deity's purposes and blueprints but simply on the unlikelihood that natural selection alone could have generated life in its present ingenious variety, it could multiply its influence many fold.

Precisely such a makeover has been in the works since 1990 or so. The new catchword is "intelligent design" (ID), whose chief propagators are Phillip E. Johnson, Michael J. Behe, Michael Denton, William A. Dembski, Jonathan Wells, Nancy Pearcey, and Stephen C. Meyer. Armed with Ph.D.'s in assorted fields, attuned to every quarrel within the Darwinian establishment, and pooling their efforts through the coordination of a well-funded organization, Seattle's Discovery Institute, these are shrewd and media-savvy people. They are very busy turning out popular books, holding press conferences and briefings, working the Internet, wooing legislators, lecturing on secular as well as religious campuses, and even, in one instance, securing an on-campus institute all to themselves.[3]

The IDers intend to outflank Darwin by accepting his vision in key respects, thereby lending weight to their one key reservation. Yes, most of them concede, our planet has been in orbit for billions of years. No, Earth's ten million species probably weren't crammed into Eden together. And yes, the extinction of some 99 percent of those species through eons preceding our own tardy appearance is an undeniable fact. Even the development, through natural selection, of adaptive variation within a given species is a sacrificed pawn. The new creationists draw the line only at the descent of whole species from one another. If those major transitions can be made to look implausible as natural outcomes, they can be credited to the Judeo-Christian God, making it a little more thinkable that he could also, if he chose, fulfill prophecies, answer prayers, and raise the dead.

This is, on its face, a highly precarious strategy. According to the premises that intelligent design freely allows, speciation *isn't* very hard to explain. If natural selection

can produce variations without miraculous help, there is every reason to suppose that it can yield more fundamental types as well. Indeed, Darwin believed, and many contemporary biologists agree, that the very distinction between variation and speciation is vacuous. One species can be distinguished from its closest kin only retrospectively, when it is found that the two can no longer interbreed. The cause of that splitting can be something as mundane as a geographical barrier erected between two groupings of the same population, whose reproductive systems or routines then develop slight but fateful differences. And if one of those sets then goes extinct without leaving traces that come to the notice of paleontologists, the surviving set may not be considered a new species after all, since no discontinuity in breeding will have come to light. The whole business requires a bookkeeper, perhaps, but surely not a God.

In effect, then, the intelligent design team has handed argumentative victory to its opponents before the debate has even begun. As the movement's acknowledged leader, the emeritus UC- Berkeley law professor Phillip Johnson, concedes in his latest book, *The Wedge of Truth*, "If nature is all there is, and matter had to do its own creating, then there is every reason to believe that the Darwinian model is the best model we will ever have of how the job might have been done." Such a weak hand prompts Johnson and others to retreat to the Bible for "proof" that nature is subordinate to God. If scientists can't perceive this all-important truth, it's because their "methodological naturalism" partakes of a more sweeping "metaphysical naturalism"—that is, a built-in atheism. Once this blindness to spiritual factors becomes generally recognized, the persuasiveness of Darwinism will supposedly vanish.

While awaiting this unlikely outcome,[4] however, ID theorists also make an appeal to consensual empiricism. The rhetorically adept Johnson, for example, highlights every disagreement within the evolutionary camp so that Darwinism as a whole will appear to be moribund. There are many such areas of dispute, having to do with morphological versus genetic trees of relationship; with convergent evolution versus common descent; with individual versus group selection; with "punctuated equilibria" versus relatively steady change; with sociobiological versus cultural explanations of modern human traits; and with the weight that should be assigned to natural selection vis-à-vis sexual selection, symbiosis, genetic drift, gene flow between populations, pleiotropy (multiple effects from single genes), structural constraints on development, and principles of self-organizing order. But Johnson misportrays healthy debate as irreparable damage to the evolutionary model—to which, as he knows, all of the contending factionalists comfortably subscribe.

The Wedge of Truth adds nothing of substance to Johnson's four previous volumes in the same vein. By now, though, his cause has been taken up by younger theorists whose training in science affords them a chance to make the same case with a more imposing technical air. In *Icons of Evolution: Science or Myth?*, for example, Jonathan Wells mines the standard evolutionary textbooks for exaggerated claims and misleading examples, which he counts as marks against evolution itself. His goal, of course, is not to improve the next editions of those books but to get them replaced by ID counterparts.[5] More broadly, he calls for a taxpayer revolt against research funding for "dogmatic Darwinists" and for the universities that house their "massive indoctrination campaign." What he cannily refrains from saying is that a prior religious commitment, not a concern for scientific accuracy, governs his critique. One must open the links on Wells's Web site to learn that, after consulting God in his prayers and attending to the direct personal urging of the Reverend Sun Myung Moon, whom he calls "the second coming of Christ," he decided that he should "devote [his] life to destroying Darwinism."

What is truly distinctive about the intelligent design movement is its professional-looking attack on evolution at the molecular level. Darwin had famously dared his critics to find "any complex organ...which could not possibly have been formed by numerous, successive, slight modifications." Having failed to unearth any such organ, anti-evolutionists have recently turned to the self-replicating cell, with its myriad types of proteins and its many interdependent functions. In *Darwin's Black Box: The Biochemical Challenge to Evolution* (1996), the Catholic biochemist Michael J. Behe has asked whether such amazing machinery could have come into existence by means of "slight modifications." His answer is no: God's intervention within the cell can be demonstrated through the elimination of every pos-sibility other than conscious design. Without

waiting to learn what his fellow biochemists think of this breakthrough (they have scoffed at it), Behe generously ascribed it to them and called it "one of the greatest achievements in the history of science."

The heart of Behe's case is his notion of irreducible complexity. Any mechanical or biological system—a mousetrap, say, or a bacterial flagellum—is irreducibly complex if each of its elements is indispensable to its functioning. How could one irreducibly complex system ever evolve into another? According to Behe, any stepwise mutation that altered the original would have rendered it not just clumsy but useless and thus incapable of survival. To maintain otherwise, he urges, would be like saying that a bicycle could grow into a motorcycle by having its parts traded, one by one, for a heavy chassis, a gearbox, spark plugs, and so on, while never ceasing to constitute a maximally efficient vehicle. Since that is impossible, Behe declares, "the assertion of Darwinian molecular evolution is merely bluster."

The IDers have closed ranks behind Behe as their David to the Darwinian Goliath. His inspiration pervades their manifesto anthology, *Mere Creation: Science, Faith and Intelligent Design*, a triumphalist volume in which the impending collapse of evolutionism is treated as a settled matter. In the view of the editor, William Dembski, Darwinism is already so far gone, and the prospect of reverse-engineering God's works to learn his tricks is so appealing, that "in the next five years intelligent design will be sufficiently developed to deserve funding from the National Science Foundation."

Dembski himself is the author of two books, *The Design Inference: Eliminating Chance Through Small Probabilities* (1998) and *Intelligent Design: The Bridge Between Science and Theology* (1999), that put the case for irreducible complexity on more general grounds than Behe's. The key question about Darwinism, Dembski has perceived, is the one that Paley would have asked: whether natural selection can result in organs and organisms whose high degree of order associates them with made objects (a compass, say) rather than with found objects such as a rock. By applying an algorithmic "explanatory filter," Dembski believes, we can make this discrimination with great reliability. Design must be inferred wherever we find *contingency* (the object can't be fully explained as an outcome of automatic processes), *complexity* (it can't have been produced by chance alone), and *specification* (it shows a pattern that we commonly associate with intelligence). Since living forms display all three of these properties, says Dembski, they must have been intelligently designed.

Working evolutionists, once they notice that Behe's and Dembski's "findings" haven't been underwritten by a single peer-reviewed paper, are disinclined to waste their time refuting them. Until recently, even those writers who do conscientiously alert the broad public to the fallacies of creationism have allowed intelligent design to go unchallenged. But that deficit has now been handsomely repaired by two critiques: Robert T. Pennock's comprehensive and consistently rational *Tower of Babel*, the best book opposing creationism in all of its guises, and Kenneth R. Miller's *Finding Darwin's God*, whose brilliant first half reveals in bracing detail that intelligent design is out of touch with recent research.

As Pennock shows, Behe's analogical rhetoric is gravely misleading. He makes it seem that *one* exemplar of a molecular structure faces impossible odds against transforming itself into *one* quite different form while remaining highly adaptive. But evolutionary change, especially at the level of molecules and cells, occurs in vast populations, all but a few of whose members can be sacrificed to newly hostile conditions and dead-end mutations. Antibiotic resistance among bacteria and the rapid evolution of the HIV virus are two common examples that carry more weight than any number of mousetraps and bicycles.

Both Pennock and Miller demonstrate that evolution is not a designer but a scavenger that makes do with jury-rigged solutions and then improves them as opportunities and emergencies present themselves. Typically, the new mechanism will have discarded "scaffolding" elements that were no longer needed. And conversely, a part that may have been only mildly beneficial in one machine can become essential to its successor, which may serve a quite different end. This chain of makeshift solutions is no less true of cilia and flagella than it is of the reptilian jaw that eventually lent two bones to the

mammalian middle ear.[6]

As for Dembski, his explanatory filter assumes what it is supposed to prove, that natural causes can't have brought about the "complex specified information" characteristic of life forms. Dembski fails to grasp that Darwinism posits neither chance nor necessity as an absolute explainer of those forms. Rather, it envisions a continual, novelty-generating disequilibrium between the two, with aleatory processes (mutation, sexual recombination, migratory mixing) and the elimination of the unfit operating in staggered tandem over time. Declaring this to be impossible by reference to information theory, as Dembski does with mathematical sleight-of-hand, is just a way of foreclosing the solid evidence in its favor.[7]

By denying that natural selection can generate specified complexity, theorists like Dembski and Behe saddle themselves with the task of de-termining when the divine designer infused that complexity into his creatures. Did he do it (as Behe believes) all at once at the outset, programming the very first cells with the entire repertoire of genes needed for every successor species? Or did he (Dembski's preference) opt for "discrete insertions over time," molding here a Velociraptor, there a violet, and elsewhere a hominid according to his inscrutable will? Miller and Pennock show that both models entail a host of intractable problems.

The proper way to assess any theory is to weigh its explanatory advantages against those of every extant rival. Neo-Darwinian natural selection is endlessly fruitful, enjoying corroboration from an imposing array of disciplines, including paleontology, genetics, systematics, embryology, anatomy, biogeography, biochemistry, cell biology, molecular biology, physical anthropology, and ethology. By contrast, intelligent design lacks any naturalistic causal hypotheses and thus enjoys no consilience with any branch of science. Its one unvarying conclusion— "God must have made this thing"— would preempt further investigation and place biological science in the thrall of theology.

Even the theology, moreover, would be hobbled by contradictions. Intelligent design awkwardly embraces two clashing deities—one a glutton for praise and a dispenser of wrath, absolution, and grace, the other a curiously inept cobbler of species that need to be periodically revised and that keep getting snuffed out by the very conditions he provided for them. Why, we must wonder, would the shaper of the universe have frittered away thirteen billion years, turning out quadrillions of useless stars, before getting around to the one thing he really cared about, seeing to it that a minuscule minority of earthling vertebrates are washed clean of sin and guaranteed an eternal place in his company? And should the God of love and mercy be given credit for the anopheles mosquito, the schistosomiasis parasite, anthrax, smallpox, bubonic plague...? By purporting to detect the divine signature on every molecule while nevertheless conceding that natural selection does account for variations, the champions of intelligent design have made a conceptual mess that leaves the ancient dilemmas of theodicy harder than ever to resolve.

A conceptual mess can persist indefinitely, however, if its very muddle allows cherished illusions to be retained. As we will see in a second essay, intelligent design is thriving not just among programmatic creationists but also in cultural circles where illogic and self-indulgence are usually condemned. And even stronger evidence that the Darwinian revolution remains incomplete can be found within the evolutionary establishment itself, where Darwin's vision is often prettified to make it safe for doctrines that he himself was sadly compelled to leave behind.

—This is the first of two articles.

Notes

[1] *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe Without Design* (revised edition; Norton, 1996), p. 6.

[2] Daniel C. Dennett, *Darwin's Dangerous Idea: Evolution and the Meanings of Life* (Touchstone, 1995), p. 63.

[3] I refer to Baylor University's Michael Polanyi Center, whose founding director was William Dembski. Despite its Baptist affiliation, however, Baylor has not proved quite ready for intelligent design. Soon after the center was established without faculty consultation, scientists on the campus called for its dissolution. Though it remains in existence, the openly evangelizing Dembski was relieved of his directorship in October 2000. The new director, Bruce Gordon, has been at pains to charac-terize intelligent design as a research paradigm, not an established fact.

[4] We can be quite sure that science will never become spiritual in Johnson's sense—not because scientists are committed atheists but because their job is to test theories against the real-world consequences that those theories entail. An immaterial factor such as God's will can't figure in a successful empirical argument, because it is compatible with every physical state of affairs.

[5] One such book, cleverly crafted to pass constitutional review, already exists: Percival Davis and Dean H. Kenyon, *Of Pandas and People* (Haugh-ton, 1993). The educational strategy for getting similar works into the classroom is set forth in David K. DeWolf, Stephen C. Meyer, and Mark E. DeForrest, *Intelligent Design in Public School Science Curricula: A Legal Guidebook* (Foundation for Thought and Ethics, 1999).

[6] Miller's best example is a sequence of experiments run by Barry Hall in 1982. By tinkering with genes, Hall disrupted the mechanism that enables bacteria to make use of lactose as food, whereupon the handicapped cells were challenged to find a way of growing on lactose after all. Before long, and without acts of selection by the experimenter, the bacteria had hijacked another, previously indifferent, gene to serve the missing function, and the entire system then responded with still further adaptations. The result looked as irreducibly complex as Behe could have wished, but neither Hall nor God can be regarded as its author.

[7] Dembski reasons that information can only diminish when acted upon by chance processes. But he has confounded two notions, "Shannon information," or reduction of uncertainty, and complexity proper. For an account of his error, see David Roche, "A Bit Confused: Creationism and Information Theory," *The Skeptical Inquirer*, March/April 2001, pp. 40–42.

Letters

November 29, 2001: Roger Shattuck, 'Saving Us from Darwin': An Exchange