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Tower of Babel: The Evidence Against the New Creationism by Robert T. Pennock. Cambridge, MA: MIT Press, 1999. 440 pp. \$55.00. ISBN 0-262-16180-X.

Charles Darwin's body was interred in Westminster Abbey in 1882, but he cannot yet rest in peace. Since the publication of *Origin of Species* in 1859, the tide of anti-Darwinism has ebbed and flowed. With the scientific community Darwin won a rapid but only partial victory. Since Darwin's day few legitimate scientists have questioned the fact of evolution, i.e., few doubt that current populations of organisms arose by a natural process of descent with modification from ancestral populations of very different organisms. Many scientists rejected natural selection, the Darwinian mechanism of evolution. In fact, with the rise of Mendelian genetics in the early 20th century, many scientists came to regard macromutations as the predominant cause of evolutionary change rather than the gradual process of natural selection. The achievement of the Neo-Darwinian Synthesis in the 1930's and '40's reconciled the Mendelians and the Darwinians, but debates continue to this day on the relative importance of the various evolutionary mechanisms.

The resistance of scientists to Darwinism was nothing compared to the rancor of ideologues. Certainly no theory in the history of science—not even Copernican heliocentrism—has elicited such intense, bitter, and intransigent opposition as Darwinian evolution. With conservative Christians, the reason for their unease is clear. If evolution occurred, then the Bible has many factual

errors. There cannot literally have been a six-day creation, a Garden of Eden, an Adam and Eve, a universal flood, etc. Further, key theological doctrines are endangered. If Eve was not tempted into sin by the serpent, then there was no Fall of Man, and if Man did not fall, where is the need for redemption through the blood of Christ? Yet ideologies of the left have often been just as passionately anti-Darwinian. The extreme hostility of left-wing literary scholars towards even the mildest and most carefully qualified forms of sociobiology or evolutionary psychology is a case in point. As philosopher Daniel Dennett has observed that Darwinism is "universal acid" that threatens to corrode all ideologies—feminism as well as fundamentalism.

There is something very peculiar about the latest creationist attacks on evolution. Such critiques are a pastiche of the old and the new, the crass and the classy, the hick and the *chic* (as Phillip Kitcher put it). Arguments so musty that they seem to date back to the Cretaceous are wrapped in the latest jargon of molecular biology or information theory. Canards rebutted by Darwin and Huxley return under new guises, some so heavily camouflaged that it takes a sharp eye to see that they are not new weapons but only ancient, creaking Civil War-era ordnance.

The ideal opponent of creationist tactics and rhetoric would be someone with the patience of Job, the knowledge of Darwin, and the analytical skills and rapier wit of Bertrand Russell. Probably nobody combines all of these qualities, but Robert T. Pennock certainly ranks with the best and most effective critics of creationism. Though *Tower of Babel* is now four years old, it has lost none of its freshness or relevance. Indeed, with antievolutionists winning victories in places like Cobb County, Georgia—where textbooks in the public schools must carry a disclaimer labeling evolution as "only a theory"—books such as Pennock's are especially needed.

Pennock focuses on the "new" creationism, which goes by the name of "intelligent-design theory." Intelligent design creationism (IDC), or "neo-creo" as it has been dubbed, is the latest and most sophisticated of many such efforts. The "science" in creationism does not really change all that much (after all, it is not really about science). What changes are the tactics and the rhetoric. In one way, IDC employs the same tactic as its forebearers: It offers only the vaguest gestures towards a theory of its own. Since design hypotheses "explain" phenomena in terms of the inscrutable acts of an occult being, it is hard to make them look very much like what usually passes for a scientific theory. Rather, as with all earlier versions of creationism, IDC hopes to make the hand of the Creator evident by discrediting evolutionary science.

In other ways, the tactics of IDC are new. IDC is not committed, at least not explicitly, to Biblicism; it is willing to grant that the earth is billions of years old, and so the Genesis chronology must be wrong (by six orders of magnitude). So IDC is an "old earth" form of creationism, as opposed to the "young earth" fundamentalists who must accept the record of "begats" and the ages of the Patriarchs in Genesis, and so cannot allow a world older than six to

ten thousand years. Most notably, IDC expands its scope by not just attacking Darwinism, but by seeking to undermine the "metaphysical naturalism" which they regard as the philosophical basis for Darwinism and for contemporary science in general.

One of Pennock's most effective and entertaining chapters examines the conflict between young-earth creationism (appropriately abbreviated as YEC) and old-earth creationism (OEC). The conflict between proponents of YEC and of OEC has been protracted and bitter. The former regard the latter as heretics and the latter see the former as obscurantists. With perhaps just a touch of *Schadenfreude*, Pennock dwells on the mutual recriminations bandied about in the spats between creationists. It may appear a bit unseemly for hostile outsiders to take pleasure in the internal discords of creationism, but creationists cannot complain if they do. After all, one of the standard rhetorical ploys of creationists has always been to gloat over the disputes between evolutionists and to portray such conflicts as discrediting the whole field.

As I say, critics of creationism must possess vast reservoirs of patience since some of the creationist chestnuts are stale indeed and it is very tiresome to have to roast them yet again. Pennock performs this unenviable task with verve and with a new twist that puts things in a clearer light. He notes that many of the creationists' arguments against the evolution of species would apply just as well to the evolution of language. Yet language unquestionably does evolve, as anyone who has taken a course in Chaucer can attest. Pennock illustrates the point by quoting the Lord's Prayer from the Wyclif Bible (14th century), the King James Version (17th century), and a contemporary translation. Further, linguists have constructed phylogenies showing lines of descent and relationships between languages and dialects. Languages and dialects also go extinct as peoples and ways of life disappear. Pennock has a most amusing passage about how the Texas cowboy dialect is preserved as a linguistic living fossil in his favorite dance hall. Like Darwin, Pennock is very good at supporting evolution with arguments based upon analogy. He shows that standard creationist arguments against evolution are even more obviously absurd when applied to the development of language.

The leading activist and most visible spokesman for IDC has been Berkeley law professor Phillip E. Johnson. Johnson's arguments specifically against evolution are just the same old charges that have been made—and refuted—hundreds of times. What distinguishes his approach is that his attack on Darwinism is just a corollary of his larger attack on "metaphysical naturalism." According to Johnson, some scientists are dogmatically committed to the philosophical position that physical reality is the only reality, and the views of these militant atheists and materialists have prevailed in science. Johnson, and, alas, a few noted philosophers now argue that there should be a "theistic science" that permits creationist hypotheses.

Pennock replies that the naturalism of science is methodological, not metaphysical; the methodological strictures of science tell us *how* inquiry is to be conducted, not what we must ultimately discover. Or, as Pennock pithily

expresses it: "science is godless in the same way that plumbing is godless" (p. 282). Whether we are plumbers or physicists, we can test our hypotheses only if we can expect things to happen in predictable ways. Testability requires prediction, and prediction requires that theoretical posits be postulated to connect with phenomena in regular and lawlike ways. By contrast, supernatural beings are notoriously unpredictable. Ghosts and gods do what they want for reasons they do not deign to reveal to mortals. Further, supernatural theories are often untestable because they have no empirical content; that is, they are framed to be compatible with any conceivable evidence. Alternatively, proponents of such hypotheses will shield them with an impenetrable armor of *ad hoc* auxiliary hypotheses that make it virtually impossible to test their core claims.

Pennock is quite right that supernatural hypotheses are notoriously intractable when it comes to testing (scripture even warns against putting the Lord to the test). But he recognizes (p. 282) that in the history of science naturalistic accounts often have gone head-to-head against entrenched supernatural theories. As he notes, science has abandoned the supernatural largely because supernatural theories consistently lost to naturalistic competitors (p. 282). For instance, Darwin did not dismiss special creation on metaphysical or methodological grounds; he showed that it was inferior to natural selection *vis-à-vis* the evidence. For all that we can know *a priori*, it might have turned out that demons cause psychosis, that angry fire gods cause volcanoes, and that all species were created over a six-day period in the Garden of Eden. But these things are not true, and we know, on empirical grounds, that they are not. Scientists respect the methodological strictures against the supernatural not because of bias, but because of the long and bitter struggles of science against supernaturalist obscurantism.

By the way, just how did methodological naturalism become *de rigueur* in every field of science, from archaeology to zoology? Two kinds of answers seem possible: (1) The methodological naturalism of science is best explained sociologically, perhaps, e.g., as due to an increasingly secular *Zeitgeist*, scientists' attraction to an ideology that rationalizes their vested interests, and the insistent drum-beating of a powerful cadre of militant atheists and materialists. (2) Methodological naturalism, like various other heuristic principles guiding science, was adopted for legitimate philosophical and pragmatic reasons as a rule conducive to successful theorizing and the advancement of science.

Johnson and his fellow travelers opt for an explanation like (1). That is, they do not think that methodological naturalism was adopted to serve *scientific* ends, but in obedience to an ideological imperative. Curiously, considering that they are darlings of the political and religious right, this puts them in the same camp as the social constructivist and postmodernist science critics of the "academic left." Like these latter, Johnson must hold that politics and ideology rule in science. After all, in his view a militant clique has imposed an ideological hegemony, and scientists, usually a restive and individualistic lot, have blindly followed. Like politics, antiscience makes strange bedfellows.

Creationism is not all negative, however. Its defenders sometimes move beyond attacks on evolution and naturalism to offer arguments that, they think, give positive support to creationist tenets. Pennock's chapter titled "Chariots of the Gods" examines these arguments and shows that, as the chapter title implies, creationist claims often rank with Erich von Daniken's speculations about ancient astronauts. Indeed, like von Daniken's books, some of the works purporting to make a case for creationism are crackpot classics. My personal favorite is *Dinosaurs by Design* by Duane Gish, which shows dinosaurs boarding Noah's Ark, and St. George slaying a *Baryonyx*! Pennock also examines more serious efforts such as the claims of Norman Geisler and William Dembski that occurrences of "specified complexity" in nature demand an intelligent designer.

Finally, if creationism were practiced only among consenting adults, perhaps books like Pennock's would be unnecessary and malign neglect would be the best response to creationist claims. However, creationists have frequently, sometimes successfully, pushed for the promotion of their views in the public schools. American students already compare poorly in science education to students of many countries, and a victory by creationists would exacerbate the problem, to say the least. Therefore creationism is a vital public issue. Pennock closes his book with a chapter stating the case against a creationist curriculum in the public schools.

The main problem with about nine out of ten books is that they are too long. Long books often lose focus and exhaust the reader by chasing points of marginal interest or relevance. Pennock's book is long, well over 400 pages including notes, bibliography, and index. Yet it is not a heavy tome, except in the quality of the thought invested in it. Pennock writes with a light touch and his text is enlivened by wit, pithy expression, and felicitous phrasing. It is a book that will fortify and encourage those alarmed by the recent inroads of IDC. Creationists will react with anger, not because the book is in any way unfair or harsh—quite the contrary. The book will discomfort them precisely because it tells the truth.

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Unintelligent Design by Mark Perakh. Amherst: Prometheus Books, 2003. 420 pp. \$32.00 (cloth). ISBN 1-59102-084-0.

Perakh aims to show that certain attempts to reconcile science and religion are unsound. In particular he takes on intelligent-design theorists and various Jewish