



Impeaching a Self-Appointed Judge

DARWIN ON TRIAL, by Phillip E. Johnson. Washington, D.C., Regnery Gateway, 1991 (\$19.95).

I teach a course at Harvard with philosopher Robert Nozick and lawyer Alan Dershowitz. We take major issues engaged by each of our professions—from abortion to racism to right-to-die—and we try to explore and integrate our various approaches. We raise many questions and reach no solutions.

Clearly, I believe in this interdisciplinary exercise, and I accept the enlightenment that intelligent outsiders can bring to the puzzles of a discipline. The differences in approach are so fascinating—and each valid in its own realm. Philosophers will dissect the logic of an argument, an exercise devoid of empirical content, well past the point of glaze over scientific eyes (and here I blame scientists for their parochiality, for all the world's empirics cannot save an argument falsely formulated). Lawyers face a still different problem that makes their enterprise even more divergent from science—and for two major reasons.

First, the law must reach a decision even when insufficient evidence exists for confident judgment. (Scientists often err in the opposite direction of overcaution, even when the evidence is compelling, if not watertight.) Thus, in capital cases, the law must free a probably guilty man whose malfesance cannot be proved beyond a doubt (a moral principle that seems admirable to me but would not work well in science). We operate with probabilities; the law must often traffic in absolutes.

Second, there is no "natural law" waiting to be discovered "out there" (*pace* Clarence Thomas in his recent testimony). Legal systems are human inventions, based on a history of human thought and practice. Consequently, the law gives decisive weight to the history of its own development—hence the rule of precedent in deciding cases. Scientists work in an opposite way: we search continually for new signals from nature to invalidate a history of past argument. (As a sometime historian of science, I wish that scientists, like lawyers, would pay more attention to, and have more reverence for, their pasts—but I understand why this is not likely to happen.)

Phillip E. Johnson is a law professor



DARWIN'S LAST BOOK, on worms, received this commentary in the October 1881 Punch. (The illustration does not appear in the book under review.)

at Berkeley and "a philosophical theist and a Christian" who strongly believes in "a Creator who plays an active role in worldly affairs." His book has received great "play" in print and television, largely (I suppose) because such unconventional products rarely emanate from the symbolic home of California "flowerpower." The press loves an oddity. This publicity is certainly no measure of the book's merit, as I shall argue. Now, I most emphatically do not claim that a lawyer shouldn't poke his

nose into our domain; nor do I hold that an attorney couldn't write a good book about evolution. A law professor might well compose a classic about the rhetoric and style of evolutionary discourse; subtlety of argument, after all, is a lawyer's business. But, to be useful in this way, a lawyer would have to understand and use our norms and rules, or at least tell us where we err in our procedures; he cannot simply trot out some applicable criteria from his own world and falsely condemn us from a

mixture of ignorance and inappropriateness. Johnson, unfortunately, has taken the low road in writing a very bad book entitled *Darwin on Trial*.

In a "classic" of antievolutionary literature from the generation just past, lawyer Norman Macbeth (1971) wrote a much better book from the same standpoint, entitled *Darwin Retried* (titles are not subject to copyright). Macbeth ultimately failed (though he raised some disturbing points along the way) because he used an inappropriate legal criterion: the defendant (an opponent of evolution) is accused by the scientific establishment and must be acquitted if the faintest shadow of doubt can be raised against Darwinism. (As science is not a discipline that claims to establish certainty, all its conclusions would fall by this inappropriate procedure.)

Johnson's current incarnation of this false strategy, *Darwin on Trial*, hardly deserves to be called a book at all. It is, at best, a long magazine article promoted to hard covers—a clumsy, repetitious abstract argument with no weighing of evidence, no careful reading of literature on all sides, no full citation of sources (the book does not even contain a bibliography) and occasional use of scientific literature only to score rhetorical points. I see no evidence that Johnson has ever visited a scientist's laboratory, has any concept of quotidian work in the field or has read widely beyond writing for nonspecialists and the most "newsworthy" of professional claims.

The book, in short, is full of errors, badly argued, based on false criteria, and abysmally written. Didn't anyone ever teach Johnson not to end chapters with "announcement sentences" or to begin subsequent sections with summaries? Chapter 6, for example, ends with a real zinger: "We will look at that claim in the next chapter." The very next chapter then begins with the maximally lively: "Before we try to get any answers out of the molecular evidence, we had better review where we stand." Mrs. McInerney, my tough but beloved third-grade teacher, would have rapped his knuckles sore for such a construction, used by Johnson at almost every chapter transition.

Johnson is not a "scientific creationist" of Duane Gish's ilk—the "young earth" Biblical literalists who have caused so much political trouble of late, but whom we beat in the Supreme Court in 1987. He accepts the earth's great age and allows that God may have chosen to work via natural selection and other evolutionary principles (though He may also operate by miraculous intervention if and when He chooses). Johnson encapsulates his major insistence by writing: "In the broadest sense, a 'creationist' is

simply a person who believes that the world (and especially mankind) was *designed*, and exists for a *purpose*." Darwinism, Johnson claims, inherently and explicitly denies such a belief and therefore constitutes a naturalistic philosophy intrinsically opposed to religion.

But this is the oldest canard and non sequitur in the debater's book. To say it for all my colleagues and for the umpteenth millionth time (from college bull sessions to learned treatises): science simply cannot (by its legitimate methods) adjudicate the issue of God's possible superintendence of nature. We neither affirm nor deny it; we simply can't comment on it as scientists. If some of our crowd have made untoward statements claiming that Darwinism disproves God, then I will find Mrs. McInerney and have their knuckles rapped for it (as long as she can equally treat those members of our crowd who have argued that Darwinism must be God's method of action). Science can work only with naturalistic explanations; it can neither affirm nor deny other types of actors (like God) in other spheres (the moral realm, for example).

Forget philosophy for a moment; the simple empirics of the past hundred years should suffice. Darwin himself was agnostic (having lost his religious beliefs upon the tragic death of his favorite daughter), but the great American botanist Asa Gray, who favored natural selection and wrote a book entitled *Darwiniana*, was a devout Christian. Move forward 50 years: Charles D. Walcott, discoverer of the Burgess Shale fossils, was a convinced Darwinian and an equally firm Christian, who believed that God had ordained natural selection to construct a history of life according to His plans and purposes. Move on another 50 years to the two greatest evolutionists of our generation: G. G. Simpson was a humanistic agnostic, Theodosius Dobzhansky a believing Russian Orthodox. Either half my colleagues are enormously stupid, or else the science of Darwinism is fully compatible with conventional religious beliefs—and equally compatible with atheism, thus proving that the two great realms of nature's factuality and the source of human morality do not strongly overlap.

But Johnson's major premise—the inherent Godlessness of Darwinism—could be wrong, and he might still have a good argument for the major thrust of his text: the attempt to show that Darwinism is a dogma, unsupported by substantial and meaningful evidence, and propped up by false logic. But here he fails utterly, almost comically (Macbeth's 1971 book is much better).

Johnson's line of argument collapses

in two major ways, the second more serious than the first. I feel a bit more forgiveness in this first category—familiarity with the facts of biology—because the field is immense and alien to Johnson's training. Still, the density of simple error is so high that I must question wider competence when attempts at extension yield such poor results. To cite just a few examples from the compendium of Johnson's factual and terminological errors: On page 16, he claims that all immediate variation for natural selection comes from mutation: "Darwinian evolution postulates two elements. The first is what Darwin called 'variation,' and what scientists today call *mutation*." He then realizes that he has neglected sexual recombination, the vastly predominant source of immediate variation in sexual species, but he makes his error worse by including recombination as a category of mutation. On page 30, he reports that "sexual selection is a relatively minor component in Darwinist theory today." But sexual selection is perhaps the hottest Darwinian topic of the past decade, subject of at least a dozen books (which Johnson has neither noted nor read—a sure sign of his unfamiliarity with current thinking in evolutionary theory). On page 41, he states that polyploidy (as a result of doubling of chromosomes) can occur only in "hermaphrodite species capable of self-fertilization"—and therefore can play little role in major change (for self-doubling does not yield markedly new qualities). But the evolutionarily potent form of polyploidy is not the autopolyploidy that he equates with the entire phenomenon, but allopolyploidy, or doubling of both male and female components after fertilization with pollen of a different species.

On page 60, he calls the German paleontologist Otto Schindewolf a saltationist, whereas Schindewolf's subtle theory contained a central element of insensible change in a process that he called proterogenesis (gradual seepage of juvenile traits into adult stages). Schindewolf spent most of his career studying small and continuous changes in ammonite suture patterns. On page 103, Johnson raises the old chestnut against a natural origin of earthly life by arguing: "the possibility that such a complex entity could assemble itself by chance is fantastically unlikely." Sure, and no scientist has used that argument for 20 years, now that we understand so much more about the self-organizing properties of molecules and other physical systems. The list goes on.

Second, and more important for documenting Johnson's inadequacy in his own realm of expertise, he performs

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abysmally in the lawyer's domain of the art of argument. To begin, he simply does not grasp (or chooses not to understand) the purpose and logic of evolutionary argument. I have already illustrated his central conflation of Darwinism with hostility to religion. I was particularly offended by his false and unkind accusation that scientists are being dishonest when they claim equal respect for science and religion: "Scientific naturalists do not see a contradiction, because they never meant that the realms of science and religion are of equal dignity and importance. Science for them is the realm of objective knowledge; religion is a matter of subjective belief. The two should not conflict because a rational person always prefers objective knowledge to subjective belief." Speak for yourself, Attorney Johnson. I regard the two as of equal dignity and limited contact. "The two should not conflict," because science treats factual reality, while religion struggles with human morality. I do not view moral argument as a whit less important than factual investigation.

Johnson then upholds the narrow and blinkered caricature of science as experiment and immediate observation only. Doesn't he realize that all historical science, not just evolution, would disappear by his silly restriction? Darwin, he writes, "described *The Origin of Species* as 'one long argument,' and the point of the argument was that the common ancestry thesis was so logically appealing that rigorous empirical testing was not required. He proposed no daring experimental tests, and thereby started his science on the wrong road." But Darwin spent 20 years collecting facts for evolution. The *Origin* is one long compendium of observations and empirical confirmations. To be sure, Darwin's method is not generally experimental, for singular and complex past events are not so explained by any historical science. Darwin thought long and hard about proper methodology of confirmation for historical science and used Whewell's "consilience of induction," or bringing of widely disparate information under a uniquely consistent explanation. Darwin wrote of his method in 1868: "This hypothesis may be tested...by trying whether it explains several large and independent classes of facts; such as the geological succession of organic beings, their distribution in past and present times, and their mutual affinities and homologies."

Not only does Johnson misconstrue the basic principles of our science (as I have shown), but he also fails to present cogent arguments in his own brief as well. His development of a case is fatally marred by three pervasive tech-

niques of careless or unfair discourse.

First, omissions that unjustly castigate a person or a claim. On page 5, Johnson recounts the tale of H. F. Osborn and his error in identifying a pig tooth as a human ancestor: "Osborn prominently featured 'Nebraska Man'... in his antifundamentalist newspaper articles and radio broadcasts, until the tooth was discovered to be from a peccary." True, but who made the correction? Although Johnson does not tell us, the answer is H. F. Osborn, who properly tested his claim by mounting further collecting expeditions, discovering his error and correcting it—in other words, science working at its best.

On page 74, in his lick-and-promise tour through the history of vertebrates, we learn that no intermediary has ever been discovered between rhipidistian fishes and early amphibians. Yet Johnson never mentions the first amphibians, *Ichthyostega* and *Acanthostega* (featured in all paleontological texts) with their conserved features of a fishy past: small tail fins, lateral line systems, and six to eight digits on each limb. On page 76, he admits my own claim for intermediacy in the defining anatomical transition between reptiles and mammals: passage of the reptilian jaw-joint bones into the mammalian middle ear. Trying to turn clear defeat to advantage, he writes: "We may concede Gould's narrow point." Narrow indeed; what more does he want? Then we find out: "On the other hand, there are many important features by which mammals differ from reptiles besides the jaw and ear bones, including the all-important reproductive systems." Now how am I supposed to uncover fossil evidence of hair, lactation and live birth? A profession finds the very best evidence it could, in exactly the predicted form and time, and a lawyer still tries to impeach us by rhetorical trickery. No wonder lawyer jokes are so popular in our culture.

Second, consider Johnson's false use of synecdoche. The art of having an item or part stand for the whole is a noble trope in poetry and *the* classical, unfair trick of debate. Professions are big, and everyone makes a stupid statement now and again. As an honorable opponent, you cannot use a single dumb argument to characterize an entire field. Yet Johnson does so again and again—and this, I suppose, represents the legal tactic of "poke any hole and win acquittal." Thus, Johnson quotes a few ill-informed statements, representing opposite extremes around a golden mean held by nearly every evolutionist—that natural selection is either meaningless as a tautology or necessarily and encompassingly true as an a pri-

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ori universal principle. Now both claims have been advanced, but they are held by tiny minorities and unsustained by any strong or enduring argument. The principle of natural selection does not collapse because a few individuals fall into fallacies from opposite sides of claiming too little or too much. Similarly, the consensus that science and religion are separate and equally valuable is not brought down by the fact that Julian Huxley unites them on one side, while Will Provine holds that science implies atheism on the other. Minorities are not necessarily wrong (or science would never advance), but only the cogency of their data and arguments, not the mere fact of their existence, brings down old theories.

As his third trick, Johnson continues to castigate evolutionists for old and acknowledged errors. T. H. Huxley, paraphrasing Dryden's famous line about Alexander the Great's drunken boasting, stated that life is too short to occupy oneself with the slaying of the slain more than once. In law, the illogicality of an important precedent might bring down a current structure like a house of cards. But in science, a bad old argument is just a superfluous fossil. Nothing is gained by exposing a 30-year-old error—save the obvious point that science improves by correcting its past mistakes. Yet Johnson continually tilts at such rotted windmills. He attacks Simpson's data from the 1950s on mammalian polyphyly (while we have all accepted the data of mammalian monophyly for at least 15 years). He quotes Ernst Mayr from 1963, denying neutrality of genes in principle. But much has changed in 30 years, and Mayr is as active as ever at age 87. Why not ask him what he thinks now?

Johnson's grandiose claims, backed by such poor support in fact and argument, recall a variety of phrases from a mutually favorite source: "He that troubleth his own house shall inherit the wind" (Proverbs 11:29, and source for the famous play that dramatized the Scopes trial); "They have sown the wind, and they shall reap the whirlwind" (Hosea 8:7). But *Darwin on Trial* just isn't good enough to merit such worrisome retorts. The book is scarcely more than an acrid little puff—and I therefore close with a famous line from Darwin's soul-mate, born on the same day of February 12, 1809. Abraham Lincoln wrote: "And this, too, shall pass away.' How much it expresses! How chastening in the hour of pride! How consoling in the depths of affliction!"

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