

BOOK REVIEWS

Darwin's Dangerous Idea: Evolution and the Meanings of Life by Daniel C. Dennett. New York: Simon & Schuster, 1995, 586 pp. \$30.00 (c).

In a spirited, uncompromising defense of neo-Darwinian orthodoxy, Daniel Dennett, the eminent American philosopher of mind, and head of the Center for Cognitive Studies at Tufts University, proposes to answer our theoretical doubts and allay our moral misgivings about evolution by natural selection. He explains "why Darwin's idea is so powerful, and why it promises — not threatens — to put our most cherished visions of life on a new foundation" (p. 11). In the process, Dennett shows us how this idea, in a somewhat new guise (natural selection as algorithmic process), transforms the old "mind first" world view, how the fundamental core of neo-Darwinism survives the challenges from within biology itself intact and strengthened, and finally, how Darwinian thinking may properly be applied to human affairs.

Although intended for a general, educated audience, this book may prove demanding to the uninitiated. Its approach is interdisciplinary and wide-ranging, and the relation of the parts to the whole is not always apparent. Dennett does, however, provide us with an Ariadne's thread in the form of brief summaries and previews at the end of each chapter. Those who persevere will be richly rewarded.

Evolution by natural selection, Dennett asserts, is the best single idea that anyone has ever had. It unifies, at once, "the realm of life, meaning, and purpose with the realm of space and time, cause and effect, mechanism and physical law" (p. 21). Darwin made one world out of two through a radical mechanistic reduction that banished consciousness and purpose from the process of design in nature. Before Darwin, no one knew how to take the hypothesis of design without mind seriously (p. 83). For John Locke or even David Hume, it was simply inconceivable. After Darwin, we could explain how design can emerge by way of a purposeless, mindless, mechanical process.

Dennett underscores the mindlessness of natural selection by defining it as an algorithmic process. "Here, then, is Darwin's dangerous idea: the algorithmic level is the level that best accounts for the speed of the antelope, the wing of the eagle, the shape of the orchid, the diversity of species, and all the other occasions for wonder in the world of nature" (p. 59). At the algorithmic level of analysis, design procedures are "broken into bits so tiny and stupid" that they no longer count as intelligence (p. 133). An algorithm is a recipe prescribing an exact sequence of steps that are utterly simple and guaranteed to produce results. The power of the procedure is found in its logical structure, not in the materials used to execute it — long division works with pencil and paper, a calculator, or a stick in the sand. Unlike mathematical algorithms that usually involve procedures for computing specific functions, the algorithms

that govern the winnowing work of evolution are, strictly speaking, not for anything. These foolproof, rote, mechanical procedures have no goal.

The interpretation of natural selection as an algorithmic process allows **Dennett** to tie his defense of neo-Darwinian orthodoxy to his advocacy of "strong Artificial Intelligence," the position that our intelligence can be mechanically duplicated, that machines can be made to "think." After all, every computer program is an algorithm, and perhaps, **Dennett** suggests, the mind is also. He sees evolution and artificial intelligence as the same story being played out on different time scales. **Dennett's** book is a defense of "strong AI" as well as of neo-Darwinian orthodoxy. For he seems convinced that if the former falls to its critics, the latter is likely to be found among the casualties. Artificial intelligence says we are made of robots; evolution tells us we are descended from robots. Together evolution and artificial intelligence "strike a fundamental blow at the last refuge to which people have retreated in the face of the Copernican Revolution: the mind as an inner sanctum that science cannot reach" (207).

Much of the hostility both toward evolution and an engineering approach to the mind rests on the fear that such reasoning will subvert our sense of self, drain life of meaning and purpose, and explain away our very minds. This hidden agenda of fear, **Dennett** argues, misdirects scientific debate about evolution. Behind the hot-tempered controversy, the announced revolution that changes little or nothing, and "the tremendous — and largely misguided — animosity" to Darwinian accounts of language and the human mind, **Dennett** detects a failure of nerve. It is not that the "Modern Synthesis" is in dispute, it is rather that its consequences are too hard to bear.

Dennett wants to cut through the smoke screens of avoidance, confront and disarm the animosity, and work out answers to responsible objections. In this regard, he singles out a number of distinguished thinkers for special criticism: paleontologist, Stephen Jay Gould; linguist, Noam Chomsky; philosopher, John Searle; and mathematical physicist, Roger Penrose. Gould's anti-adaptationism and insistence on "radical contingency" and "punctuated equilibrium," Chomsky's suggestion that evolutionary theory has as yet little to say about language, Searle's argument that only human minds have "original intentionality," and Penrose's conviction that our ability to "see" and "understand" mathematical truth is non-algorithmic — all these positions, **Dennett** suspects, represent attempts to refute the idea that evolution is an algorithmic process and to shield the mysteries of free will, language, and the mind from Darwinian mechanisms.

Each of these thinkers, **Dennett** claims, betrays a yearning for "skyhooks", when they should be looking only for "cranes." Skyhooks are, in **Dennett's** inventive terminology, impossible, imaginary devices that spring the frame of mechanical, algorithmic explanation. They are "mind first" forces or processes, moments of special creation, exempt from, and discontinuous with the mindless mechanics of design. Cranes, on the other hand, are the real lifters in

the evolutionary process. Cranes are complex intermediary mechanisms that arise from the process of evolution itself, and in turn, speed the process along by promoting the development of still more complex structures. In Dennett's view, God is a skyhook; sex is a crane.

Though Gould might regard Dennett's position as "hyper-" or "ultra-Darwinism," Dennett sees himself simply as a champion of "no-skyhooks-allowed" Darwinism. Dennett distinguishes "good" and "greedy" forms of reductionism. Greedy reductionism underestimates complexities in its haste to secure everything to the foundation; good reductionism is "simply the commitment to non-question-begging science" (p. 82). Good reductionists "think everything in nature can all be explained without skyhooks; greedy reductionists think it can all be explained without cranes" (p. 394).

We must, Dennett insists, look unflinchingly at Darwin's idea and its consequences. For we have listened to the wrong sirens and underestimated its power and reach. Like some universal acid, it cannot be contained. It eats its way through every barrier and into the fabric of our traditional concepts of cosmology and psychology, revolutionizing our view of the world and of ourselves.

The revolution, Dennett thinks, holds more promise than threat. Even after the acid of Darwin's idea has passed unadulterated through our most cherished monuments of purpose and meaning, it leaves them still standing, fundamentally transformed, but enhanced. What really matters is preserved in the Darwinian view. Everything great and important to us survives, burned clean of mystery and miracle, "demystified, unified, placed on more secure foundations" (p. 82).

What do the world and our values look like after they are demystified and unified by Darwin's idea? In the final section of the book, Dennett turns directly to the implications of Darwinian thinking for culture, mind, meaning, and morality. Dennett makes his way between "skyhookers" and "greedy reductionists," but it is apparent that if he errs he wants it to be on the side of reductionism. We humans are vastly different from other species, Dennett makes clear at the outset. We have culture, language, minds — cranes that allow us to rise above "the imperatives of our genes" (p. 365). We are designers and not just designed. Yet characteristically, Dennett makes equally clear that all of our talents as designers emerge from mechanical, Darwinian processes. Spiders make webs, birds make nests, beavers make dams, and we make culture. Dennett acknowledges no radical discontinuities.

In his analysis of culture, Dennett adopts a perspective which corresponds to the "gene's eye" view in current Darwinian theory. Seeking a cultural parallel to the gene, Dennett borrows Richard Dawkins' notion of a "meme." A meme is the basic unit of information which spreads by copying from one site to another and obeys, according to Dawkins, the laws of natural selection quite exactly. Meme evolution is not just analogous to genetic evolution. It is the same phenomenon. Cultural evolution simply uses a different unit of

transmission evolving in a different medium at a faster rate. Evolution by natural selection occurs wherever conditions of variation, replication and differential "fitness" exist.

Despite Dennett's enthusiasm for memes, the notion is, it seems to me, rather vague and atomistic. A **meme** "for music," for example, might refer to anything from a jingle to a conservatory. The **meme** notion may very well illuminate the study of modest forms of replicated wisdom like proverbs. But how do we move from the simple, isolated, and ill-defined unit of the **meme** to the complex forms of cultural transmission and transformation?

Unfortunately, **Dennett** also uses the **meme** notion to explain just how our minds are shaped. According to **Dennett**, human brains provide shelter for memes, and these memes to a very great degree create human minds. We are who and what we are because of earlier "infestations of memes." Our highest values are products of the memes that have spread most successfully.

Although memes allow us to transcend the tyranny of "selfish genes," **Dennett** rejects the idea of an independent mind. He uses the **meme** to counter the common view that we are "godlike creators of ideas" who can manipulate, judge, and control them from an independent "Olympian standpoint" (p. 346). "This 'we' that transcends not only its genetic creators but also its memetic creators is ... a myth" (p. 366)

Certainly, we are products of our genetic and cultural heritage. This is hardly a new idea. But **Dennett's** view has deeper implications: the "I" is nothing over and above a system of complex interactions between the body and the memes that infest it. **Dennett's** image of memes nesting unauthored and uncriticized in the mind reflects a rejection of Cartesian dualism in all its forms, along with any language that might encourage a picture of the mind as an "Inner Theater" with an observing self. Such images of inner states are, **Dennett** would contend, symptomatic of anti-scientific yearnings for skyhooks. **Dennett** wishes to rid the world of "mind first" forces, of all occult causes and ghostly processes, eliminating from the architecture of science the last traces of mind/body, consciousness/matter dualism. He wishes to refute, in the words of **Dennett's** mentor, Gilbert Ryle, **Descartes'** "dogma of the ghost in the machine."

In his discussion of the human mind, intentionality, and meaning, **Dennett** carefully remains within a framework of understanding which consorts well with "strong AI." He likens human autonomy to the Viking spacecraft on automatic pilot and denies any fundamental distinction between the intentionality of robots and the intentionality of humans. In a chapter entitled "Losing Our Minds to Darwin," **Dennett** once more links evolutionary theory and artificial intelligence: "if human minds are nonmiraculous products of evolution, then they are, in the requisite sense, artifacts, and all their powers must have an ultimately 'mechanical' explanation. We are descended from macros and made of macros, and nothing we can do is anything beyond the power of huge assemblies of macros" (p. 371).

This mechanistic, strictly third-person approach to human mentality has led some philosophers, including John Searle and Colin McGinn, to assert that Dennett has nothing to say about consciousness, that he denies its very existence. See Searle and Dennett, "The Mystery of Consciousness: An Exchange" (*The New York Review of Books*, December 21, 1995, p.83).

While it seems to me unlikely that Dennett thinks we are zombies, his "remarkably counterintuitive" position does appear to take little or no account of the immediate experience of consciousness. Dennett's view of science apparently leaves no place for first-person descriptions of inner states.

Yet when Dennett looks at moral values in a Darwinian context, the results are not earth-shaking. He sees, I think correctly, that any naturalistic ethic must be grounded in a view of human nature, but he avoids the simplistic "evolutionary ethics" of Social Darwinism. Dennett warns against rushing too quickly from facts to values and against the "genetic fallacy" — apparent in old fashioned behaviorism and sociobiology — of inferring current meaning from ancestral function. Culture, no doubt, grew out of our biological inheritance, but it does not follow that our genes are the principle beneficiaries of our current values — "our reasons aren't the reasons of fish just because fish are our ancestors" (p. 472).

Dennett is convinced that only evolutionary analysis can make sense of the origins of ethical norms, but in the final analysis, he sheds little new light on the key question of how selective pressure might produce characteristics of altruism and cooperation. Following Thomas Hobbes and Friedrich Nietzsche, he argues that morality requires the evolution of a capacity for mutual recognition and an ability to communicate a promise, but he does not develop these ideas. The chapter on "Redesigning Morality" is a very modest "Moral First Aid Manual," recycled from an earlier publication, reflecting perhaps a certain discomfort with a form of discourse that does not lend itself to the strict objectivity and precision of good science.

The impact of the Darwinian vision on our values extends, of course, beyond specific issues of ethics. We have learned from experience that no sanitary cordon can keep Darwinian thinking out of human affairs. It would seem that evolutionary theory cannot help functioning, like ancient creation myths, as a foundational narrative teaching us not only where we came from and how we are made, but also how we are to feel about our world, what we should venerate and protect, and what types of behavior we should regard as essential (see in this connection, Mary Midgley, *Evolution as a Religion*).

Dennett recognizes this power of Darwinism as drama. He shapes his method of presentation to that end, deliberately setting aside formal argument and messy detail, in order to tell a grand story of panoptic sweep. He asks us to exchange pre-Darwinian views for synoptic insight into a shared history, a vision of a single Tree of Life that allowed us to see organisms and artifacts, biology and culture, indeed, all design in the universe, from a single perspective. He uses fascinating thought experiments and imagination-stretching

images and metaphors — the Tree of Life branching and blossoming through the vast expanse of Design Space, the Library of Mendel containing all possible genomes. Dennett tells a story with pantheistic overtones, concluding with a hymn to biodiversity and an affirmation of the sacredness of the world. It is a world without mystery or miracle, but nonetheless worthy of awe and wonder. The Tree of Life, like Anselm's God, is "a being that is greater than any of us will ever conceive of in detail worthy of its detail" (p. 520). "The 'miracles' of life and consciousness turn out to be even better than we imagined back when we were sure they were inexplicable" (p. 521).

Some readers may feel themselves pulled in opposing directions by contrasting images. This bright vision, Dennett repeatedly reminds us, rests upon a sober foundation of mechanistic materialism. When describing humans, Dennett seems to go out of his way to avoid anthropomorphic language, reserving it instead for machines. His choice of metaphors is occasionally shocking: "I don't know about you, but I am not initially attracted by the idea of my brain as a sort of dungheap in which the larvae of other people's ideas renew themselves, before sending out copies of themselves in an informational diaspora. It does seem to rob my mind of its importance as both author and critic" (p. 346).

Such choices are puzzling. The words abase rather than enhance. They are not dictated by reason or science and do nothing to foster enlightened consideration of the issues.

Dennett's lucid and lively presentation is marred by a penchant for rhetorical excess. "Foes" have planted themselves on the isthmus connecting our species to all the others, "like Horatio at the bridge" (p. 335). Dennett detects a "depth of loathing of Darwin's dangerous idea" in the esteem that some non-scientists have for Teilhard de Chardin (p. 321). Safety demands that religions, like lions, "be put in cages, too" (p. 515). Dennett does not hesitate to impute motives and assign labels. Opponents are "Darwin Dreaders" and "Skyhookers." — "What hidden agendas — moral, political, religious — have driven Gould himself?" (p. 266) While such tactics may draw cheers from supporters, they do not promote understanding. Noam Chomsky's response to John Maynard Smith's review of this book, states the matter plainly: "The frantic efforts to 'defend Darwin's dangerous idea' from evil forces that regard it as neither 'dangerous' nor even particularly controversial, at this level of discussion, hardly merit comment" (*The New York Review of Books*, February 1, 1996, p.41).

That, of course, should not be the last word on this provocative book. Dennett shows us how Darwinism has succeeded as an orthodoxy and suggests how we can live with this success. At times, his stress on the utter mindlessness of the processes of evolution seems to work at cross-purposes with his desire to reassure us that we can live comfortably with Darwin. Immanuel Kant recognized long ago that if our values clash irrationally with our picture of the world, we may be left fearing for our moral sanity. But while not every-

one will agree with Dennett that mindless, mechanistic materialism is a beautiful idea, most readers will not fail to be impressed by his consistent outlook and vast learning. As Dennett informs newcomers and challenges old opponents, even experts might listen in to refresh their understanding of some fundamental issues.

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The Bell Curve Wars ed. Steven Fraser. New York: Basic Books, 1995, 216 pp. ISBN 0-465-00693-0.

The Bell Curve Debate ed. Russell Jacoby & Naomi Glauberman. New York: Times Books, 1995, 720 pp. ISBN 0-8129-2587-4.

Measured Lies ed. Joe L. Kincheloe, Shirley R. Steinberg & Aaron D. Gresson III. New York: St. Martin's Press, 1996, 454 pp. ISBN 0-312-12929-7.

I belong to what must be the least exclusive club in the country: People who have written critical reviews of *The Bell Curve: Intelligence and Class Structure in American Life* by Charles Murray and Richard Herrnstein. I counted 20 in *The Bell Curve Wars*, and 40 in *Measured Lies*. The number in *The Bell Curve Debate* is hard to calculate because, as in many numerical quantities, it all depends on the definition. As best as I can figure, there are 46 named authors, eight anonymous authors — newspaper and magazine editorial writers — and ten named writers who defend *The Bell Curve*, plus 17 who wrote on the subject *before* the book was written. Indeed, the last-mentioned category goes back to an 1865 publication of Galton — the founder and creator of the name "eugenics" — and includes as well several 1922 articles of Walter Lippmann on the nurture side of the debate. Clearly, not much is all that new under the sun.

Nevertheless, every dawn is unique, so to speak, and Murray and Herrnstein somehow captured the *Zeitgeist* of our time without really anything fresh to say on the subject. Or, so claim the many critics who point out that the arguments put forward are rehashes of plausibly quaint racist ideas such as craniometry and I.Q. equals destiny which have long since been discredited. While craniometry is unlikely to make a comeback, I.Q.'s congruence with destiny fits neatly into the current hereditarian calculus of explaining the American universe in which some are affluent and many more are not.

Most critics of *The Bell Curve* fasten on its assertions about race and the I.Q. inferiority of African Americans. In actuality, most of the book is about class structure, a subject often avoided in the U.S. because we are in theory a mobile, classless society. Murray and Herrnstein claim that we have lost the mobility of bygone days because the low-I.Q. people keep begetting low-I.Q. children who will form an increasing threat to the peaceful existence of the