

“Mystery of Mysteries: Is Evolution a Social Construction?” by Michael Ruse, Harvard University Press, 1999, 296 pages, **\$27.50** (ISBN 0-674-46706-X)

Reviewed by **Jay A. Labinger**

The title of Michael Ruse’s book--“Mystery of Mysteries: Is Evolution a Social Construction?”-- suggests a rather ambitious undertaking, and on that score readers are certainly not disappointed. Ruse, a professor of philosophy and zoology at the University of Guelph, Ontario, Canada, looks at the ongoing debates known as the “science wars” and identifies as their central issue a fundamental controversy about the nature of science. Is science best described as objective knowledge about the real world, or is it a subjective reflection of the culture it exists in? Ruse attempts to resolve this controversy by exploring the history of evolutionary biology.

His strategy is to distinguish between and assess the relative influence of two classes of values that drive the scientist. Epistemic values include the norms and criteria that philosophers offer as characteristic of science, such as consistency and coherence, predictive power, and fertility. Science’s nonepistemic values include religious and cultural beliefs, and desire for rewards and status.

Ruse examines ten notable figures in the development of evolution as a respectable scientific field. Some are historical: Charles Darwin and his grandfather Erasmus Darwin, Julian Huxley, and Theodosius Dobzhansky; some contemporary: Richard Dawkins, Stephen Jay Gould, Richard Lewontin, Edward O. Wilson, Geoffrey Parker, and the recently deceased J. John Sepkoski. He attempts to tease apart the different motivations and methodologies that underlie the contributions of each scientist.

By the book’s end, Ruse believes he has amassed evidence for several conclusions. Epistemic values, he says, are unquestionably important — increasingly so for later scientists. He shows, for example, how much contemporary evolutionary biologists have come to insist upon quantitative predictive power as a measure of good science. On the other hand, the role of cultural values is also beyond question. The entire notion of progress in evolution derives primarily from cultural influences, religion and the pervasive power of metaphor. Thus the ubiquitous image of an evolutionary “tree of life” is inextricably connected with the positive associations of “upward” metaphors. (But why, I wonder, the “descent” of man?)

Finally, Ruse asks, does science study a real world or one that science itself

constructs? Is science founded primarily on objective standards or cultural preferences? To Ruse, these are two quite separate questions. The first is a long-standing philosophical issue, going back at least to Plato. Ruse acknowledges that his historical/empirical approach has nothing to say to this question, and he refers it back to the philosophers. He thinks he can answer the second question, however; and his answer is--both. "It is true that science is special," Ruse writes, "and this is because of its standards; the critics were wrong in arguing otherwise. But it is also true that science is not special, and this is because of its culture; the defenders were wrong in arguing otherwise."

I have no objection to this conclusion, and it is consistent with the story Ruse's historical survey tells. But the way he presents his case is frequently unconvincing and even, occasionally, somewhat irritating. In this book, aimed at the general reader, Ruse is obviously concerned about going beyond his audience's comfort zone in terms of length and detail. (He provided more detail in his 1996 book, "Monad to Man," which deals with much of the same material from a different focus.) Even granting that, this book has serious shortcomings.

First, the approach of looking at a small number of specific scientists seems questionable, at best. There is a risk of selection bias. Ruse claims his choices are representative, but how can readers be sure? He supports his claim of increasing concern with epistemic standards largely by describing the more recent scientists' work in greater detail. Perhaps similar attention to detail for some of their predecessors would create a quite different impression. And does the fact that contemporary evolutionary biologists are much more mathematical than their 19th- and early 20th- century predecessors really speak to changing epistemic standards? It could merely reflect the modern availability of computers.

Furthermore, how much can we learn about science in general by focusing on individuals? Many historians and sociologists who study science, whom Ruse only caricatures in his cursory and sensationalist exposition of the science wars, consider the group to be the main locus of the scientific endeavor. It is not the initial individual discovery, they would argue, but what happens as it diffuses into the scientific community and withstands (or not) the tests of colleagues and time, that is primarily responsible for the generation of reliable scientific knowledge. Therein lies the significance of the word "social" in the phrase "social construction," which Ruse uses in his subtitle. But Ruse does not much address this aspect. He misses a great opportunity to explore an intriguing resonance between this question of the role of the individual versus the group in the evolution of scientific knowledge, on the one hand, and a parallel theme within the science of

whether selection takes place primarily at the individual or group level.

Ruse asserts the laudable goal of wanting to avoid the philosopher's tendency to obscure disputes behind hair-splitting language. But in avoiding that precipice, he sometimes falls off the other side: the very concepts and criteria at the heart of Ruse's analysis seem, to this non-philosopher reader, to begin dissolving around the edges, even as he purports to distinguish between them.

For example, is an individual scientist's commitment to epistemic values to be measured in terms of intent or of achievement? In his chapter on Harvard professor and prolific popular science author Stephen Jay Gould, Ruse observes that successful popularizers, such as Gould and the late Cornell University astronomer Carl Sagan, tend to be looked down upon by their professional colleagues. But he also argues that Gould isn't all that productive as a scientist because of his mixed motivations. "Gould's work does not yield ... the payoff you expect from full implementation of the epistemic norms of good science," Ruse writes. But what payoff can one "expect?" Science is not some sort of algorithm, where all one has to do is follow rules, and important science will automatically come out. Simple logic shows we can't infer limited commitment from limited accomplishment.

Similarly, Ruse considers Charles Darwin to have had "epistemic weaknesses" because he couldn't reconcile his theories with Lord Kelvin's calculated limit of the Earth's age. It's not that he didn't try -- which might fairly be taken as evidence for a low regard for values such as consistency and coherence. As Ruse describes it, he tried mightily, but failed. And in the end, of course, responsibility for the discrepancy turned out to lie at Kelvin's door, not Darwin's.

Ruse considers objectivity itself sometimes to be a cultural value; or, more precisely, what he calls a "metavalue," a value held about the nature of science rather than within science. Thus, he claims, many of his scientists push for objectivity not--or not only--because they think it is the right way to do good science, but because they think it is the way to make science look good and thereby secure higher status in the eyes of their beholders. No doubt this distinction has some validity, although it is more than a little reminiscent of the tired old argument over whether altruists really want to do good, or just make themselves feel better by doing good. But it fuzzes the categories in such a way that it ensures the conclusion Ruse finally reaches--that epistemic and cultural factors are both important.

At the end of the book, Ruse suggests that those who wish to engage in these debates must first establish their credentials by carrying out a similarly detailed historical study of their own pet field. Given the rather uneventful outcome of his study, it's hard to see why anyone would bother to take up that challenge.

Nevertheless, "Mystery of Mysteries" is an entertaining and knowledgeable-- though abbreviated and selective--survey of evolutionary thought. Ruse's account of the prominent controversy between ultra-Darwinists who believe everything in life is to be explained by evolution and adaptation, represented here by Dawkins and Wilson (authors of "The Selfish Gene" and "Sociobiology" respectively), and their critics such as Gould and his Harvard colleague Lewontin, is a particular highlight. Furthermore, "Mystery of Mysteries" provides a starting point for those who want to know what the science wars are all about. However, I very much doubt that it will resolve any controversies for anyone. Why Ruse, a professional philosopher, would feel comfortable with his strong claims for having done so, is a bit of a mystery as well.

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