BOOKS: PHILOSOPHY

Unpersuasive Thoughts and Unhelpful Ideas

Lewis Wolpert

In a previous book (*1*), Philip Kitcher offered a defense of the ideas of objectivity and progress in science that incorporated his analysis of how science is actually carried out. In *Science, Truth, and Democracy*, this philosopher of science at Columbia University revises and builds on his earlier account to debunk what he refers to as the theology of science—the idea that science is a high calling dedicated to ends that transcend all others—and to oppose the demonization of science.

Science, Truth, and Democracy
by Philip Kitcher
Oxford University Press, New York, 2001. 233 pp. $29.95. ISBN 0-19-514583-6.

Through the first third of the book, Kitcher discusses the extent to which science is free from moral constraints and the degree to which it provides a privileged understanding of the way the world actually works. He also questions the claim that there is a basic difference between science and technology, a view I strongly hold. Examining the extent to which science is truly objective and is independent of human cognition, he concludes that sometimes science does achieve these ideal states. But he seems too sympathetic to the concept known as the underdetermination of theory by evidence, which claims that there are always other theories equally supported by the evidence. I cannot understand the basis for this claim. It seems absurd, and, if true, it would completely undermine the idea that science provides reliable explanations. Therefore, I would have liked examples of theories equally able to explain, for example, the coding of proteins by DNA or Harvey's account of the circulation of the blood. Kitcher admits that many scientists see this underdetermination problem as a philosophical one that has nothing to do with them or the real world.

The frequent absence of examples from science to illustrate or support the author's ideas is a principal weakness of the book. And the example Kitcher uses the most, cloning, involves a basic misunderstanding. He believes that the cloning of Dolly had great scientific significance because it showed that the DNA of adult vertebrate cells was not permanently altered in development. He is apparently unaware that this was demonstrated by classic experiments with frogs over 30 years ago. Dolly was just the result of a technical advance, albeit a significant one.

Far more important are Kitcher's discussions of the moral issues that may be raised by scientific findings and his consideration of how science should be properly organized. He questions whether moral issues arise only during the application of scientific knowledge and contends that the findings themselves can be morally difficult. Is it, he asks, intrinsically valuable to obtain knowledge if the information can be used to generate harmful consequences? Kitcher cannot accept the concept of pure science because scientists are motivated by more than intellectual curiosity alone (which is hardly a surprise). But, contrary to his view, motives do not determine scientific understanding. Consider Archimedes' laws of the lever and of floating bodies: what do motives have to do with their validity?

In considering the relation between the implications of a scientific finding and decisions as to how responsible scientists should behave, Kitcher takes the human genome project as his main example. Genomic sequences might provide evidence for differences that show members of one group of people are inferior in certain skills. Kitcher is sure that such a finding would further disadvantage them. Although he may be correct, he does not even consider a society that would positively compensate them (as is often done for those with genetic illnesses). To those molecular biologists working on the human genome who wish to pursue the author's goals for a well-ordered science, Kitcher offers the advice that they publicly renounce their work and turn to other research. I disagree with Kitcher's position; I regard reliable scientific knowledge as value-free. Its applications, by contrast, do have moral implications.

A well-ordered science would, in Kitcher's view, satisfy the preferences of the society in which it is practiced. But this conclusion denies all the evidence that science is universal and not culturally determined. Kitcher's analysis also suggests that citizens should have a key role in the funding of science. To go along such a route would be to ignore Medawar's crucial insight that science is the art of the soluble. It is only scientists who know which problems, among the countless possibilities, are most likely to yield to currently available approaches. We must recognize that science by popular appeal would be a disaster, and therefore we should attempt to leave the important input on how to fund science in the hands of our elected representatives. Kitcher also fails to recognize that we enter the future backwards, as Paul Valery put it, and thus all too often the applications of scientific research cannot be foreseen. The discovery of restriction enzymes, fundamental to all genetic manipulation, is a classic example of this principle.

Although I found *Science, Truth, and Democracy* thought-provoking, I disagree with many of the arguments Kitcher puts forward. Once again, I have been disappointed by a philosophical analysis of the nature of science. And I am left wondering, do philosophers really have anything useful to tell scientists?

Reference

1. P. Kitcher, *The Advancement of Science: Science Without Legend, Objectivity Without Illusions* (Oxford Univ. Press, New York, 1993).

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BROWSINGS

Enjoying Moths. *Roy Leverton*. T & AD Poyser, London, 2001. 288 pp. $39.95, £26.95. ISBN 0-85661-124-7.

Moths are much more diverse and abundant than butterflies, but they have been far less attractive to amateur naturalists than their showy fellow lepidopterans. This practical manual on "mothing" may help broaden interest in them. Rather than providing an identification guide, Leverton covers topics such as finding moths by day and at night, obtaining and rearing caterpillars, and observing and photographing these insects and their behavior. The book is profusely illustrated with the author's striking photographs, such as this "snatched shot" of a narrow-bordered bee hawk-moth (*Hemaris tityus*), and line drawings by Michael Roberts. Although Leverton deals only with the British fauna, anyone interested in learning more about moths in the wild will find this book worthwhile.

CREDIT: ROY LEVERTON/FROM *ENJOYING MOTHS*