On balance, *Bird on an Ethics Wire* should likely be judged in one of two ways. One is that it is full of wisdom, a wisdom that learns from the past with an eye to the future and that recognizes the limits of language and reason. The other is that it is a less-than-cogent philosophical treatise, lacking clarity and precision, overly reliant on intuition and inexpert sociology. It seems only one can be true. Readers will draw their own judgments, but I suppose the ultimate judge, as Somerville suggests, will be history.

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The Meaning of Science: An Introduction to the Philosophy of Science

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In this book, Lewens asks a series of questions about the broad value and significance of scientific work. It does not assume any scientific knowledge *per se*, nor does it presume that one has any familiarity with philosophy. In this book, Lewens notes that, whether they like it or not, scientists invariably end up engaging the same conceptual issues that have puzzled philosophers for millennia. It turns out, then, that the issues addressed by the philosophy of science—which this book explicitly addresses—matter in practical and pragmatic ways, for the most important questions of all address the human condition.

This book is divided into two parts, with the first part addressing what is meant by the terminology of 'science,' and the second part covering what science means to humans. Part One is composed of four chapters, with the first covering how science works, the second exploring issues of whether a given branch of investigation classifies as a science, the third covering the paradigm concept of Thomas Kuhn, and the fourth, explicating scientific realism. Part Two is also comprised of four substantive chapters, followed by an epilogue. Chapter Five covers values and veracity in science, and Chapter Six addresses the concept of altruism. Chapter Seven addresses whether there is such a thing as 'human nature,' and Eight addresses the perennial question of human freedom and if that concept is valid in view of contemporary science. The epilogue wraps up the volume by covering the reach of science. In what follows, I will delineate with more exactness the entailments of this text.

In commenting on how science works, Lewens dialogues greatly with Karl Popper, as he is the 'authority,' if you will, on the general nature of science. Popper was concerned

with distinguishing science from pseudoscience, and he stipulated that one manner in which to do so is by dismissing inductive inference, and focusing instead upon deductive reasoning. Moreover, for Popper, true science must be falsifiable. Popper also contended that scientific theories must be corroborated by independent observation. Lewens contends that it is possible to isolate an eviscerated and thereby attractive Popperianism that excludes Popper's rejection of induction, which stresses instead the themes of testability and fallibility (26).

Lewens notes that Popper and Stephen Kuhn are usually cast as rivals who offer markedly different accounts of the nature of change in the sciences. Popper takes the role of scientific rationalism and progress, whereas Kuhn is often portrayed as denying that rationality applies to science, and denies that science makes progress. Lewens, however, asserts that such a characterization is flat wrong, as Kuhn does believe that science makes progress, that changes in scientific theory are rational, and instead Popper is perhaps more vulnerable to accusations of irrationality (58).

Lewens stipulates that scientific realism is the view that the sciences represent parts of the world in an increasingly accurate manner as time proceeds. Scientific realists do not think that science can tell us all there is to know about everything, conceding instead that there is, for example, much to learn from the humanities. Moreover, scientific realists do not think that science is finished; rather, they contend that the sciences give us plenty of room for revision and improvement of ideas and assertions, as refined images of nature are produced (86).

Regarding whether humans are inherently selfish or whether they have the capacity for self-denial and valuing the interests of others, Lewens contends that Darwin did not argue that evolution had made us into proverbial egotistical monsters—despite what some of his most vociferous advocates today may state (142). Rather, Darwin averred that evolution had stamped ethics that were compatible with Christian tenets into our impressionable minds. As Lewens describes it, modern evolutionary theory, properly conceived, rejects the cynical recasting of our beneficent behaviour toward others, and it is open to the positive role of culture in explaining why we are prone to help people we have never encountered (160).

Some well-informed scientists—David Hull and Michael Ghiselin for example—have claimed that the idea of 'human nature' has no place in the light of recent scientific research. In fact, Ghiselin claims human nature is a superstition. Lewens, while not agreeing with them in a rote manner, nevertheless agrees with the thrust of their argument, noting that the sciences do not need a concept of human nature, and therefore it would be best to avoid the concept all together (184). It has often been claimed by recent philosophers and scientists that freedom is illusory, that free will is a misnomer, but this in itself is a misnomer (210).

By examining the tenets and positions of science philosophically, Lewens reveals what physics can teach us about reality, what biology can teach us about human nature, and what cognitive science can teach us about human freedom. In *The Meaning of Science,* Lewens confronts us with the practical, personal, and political purposes of science, and why it should matter to all of us. I recommend this title for all parties who have interests in philosophy of science generally, and philosophy of biology in particular.

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