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BOOK REVIEW OF *SCIENCE, POLITICS AND EVOLUTION*

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BOOK REVIEW OF ELISABETH A. LLOYD. *SCIENCE, POLITICS, AND EVOLUTION*. (CAMBRIDGE STUDIES IN PHILOSOPHY AND SCIENCE.) 301 PP., INDEX. CAMBRIDGE/NEW YORK: CAMBRIDGE UNIVERSITY PRESS, 2008. \$85 (CLOTH).

The relevance of philosophy of biology can be explained in part in terms of the additional support it has given to the many philosophers of science dissatisfied with the syntactic view of scientific theories. Elisabeth Lloyd and others have argued that the explanatory power of key aspects of evolutionary biology (namely, population genetics models) is best understood not by describing how individual phenomena are subsumed under universal laws but by assessing the fit between families of related models (often mathematical models) and the problems and phenomena that biologists are interested in. With this argument, Lloyd has made a lasting impression on how philosophy of biology is done. But her work has also articulated how some of the reasons for adopting the semantic view can help us understand other scientific and philosophical problems as well.

Books of collected essays often do not have a clear *raison d'être*: *Science, Politics, and Evolution* is an admirable exception. Even though many diligent philosophers of biology will already have read many of the twelve papers included here, reading them all together gives a better appreciation for the coherence of Lloyd's thinking about evolutionary biology and science. Let me attempt to offer a summary of the essays as if they had been intended as one long argument.

The book begins with Lloyd arguing that evolutionary biology, both in its past (Darwin) and at present (population genetics), can be better accounted for by a semantic rather than a syntactic approach to scientific explanation. Expectations of the logical unity of theories are misguided, and the value of the explanatory enterprise is not in offering unification or reduction but in searching for the most appropriate models that account for data for a given problem; for related reasons, we should not expect only one type of confirmation to warrant the adoption of any given model. We should also forgo the expectation that the same processes and properties occur in the same fashion at all levels of organization. This lesson finds application in Lloyd's examination of the role of group and species selection in evolution: one can claim selection at a level of organization without identifying an adapted trait at that same level. Not surprisingly,

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this argument is grounded in broader concerns about pan-adaptationism. Lloyd's rejection of pan-adaptationism fuels her skepticism about genic reductionism and certain hypotheses in evolutionary psychology. Finally, she shows how feminist philosophy of science may be science's best friend in the way it reveals some of the links between these issues and the reasons why some scientists—known empirical evidence notwithstanding—still adhere to some particular research projects.

Four chapters stand out. Chapter 4, "Units and Levels of Selection," makes evident that a better analysis of the unit of selection debate is not only a significant philosophical debate but an urgent scientific question as well. This chapter is a classic. Chapter 5, "Species Selections on Variability," was coauthored with Stephen Jay Gould: by arguing that the level at which selection acts can be decoupled from the level at which adaptations for that selection may be found, the authors show how natural selection could work at higher levels of organization (i.e., species). In Chapter 6, "An Open Letter to Elliott Sober and David Sloan Wilson" (the only previously unpublished article in the book), Lloyd offers a detailed analysis of the concept of adaptation by way of a sustained comment on their book *Unto Others* (Harvard, 1998). Finally, Chapter 11, "Science and Anti-Science: Objectivity and Its Real Enemies," is a compelling manifesto for the necessity of a feminist philosophy of science.

The Case of the Female Orgasm (Harvard, 2005), in which Lloyd demolishes studies showing the adaptive nature of the female orgasm, provoked a ruckus (Ch. 12 of *Science, Politics, and Evolution* offers a good primer). Reducing Lloyd's thought to that research project (and its reception) would be a disservice to the rest of her work concerning philosophy of science and evolutionary biology. All philosophers of biology need to read this latest book—if only to be reminded how all of the issues raised in Lloyd's work are in fact connected and that treating them in isolation is tricky at best. Nonphilosophers will find here one of the best guides to the richness that philosophy of biology has to offer philosophy of science and science studies.