

Preface

Theodosius Dobzhansky, credited as one of the founders of the modern theory of evolution, wrote in 1972 that "Nothing in Biology Makes Sense Except in the Light of Evolution," the title of his address to a convention of the National Association of Biology Teachers.¹ The theory of evolution is, indeed, the central organizing concept of modern biology. Evolution scientifically explains why there are so many different kinds of organisms, and it accounts for their similarities and differences. It accounts for the appearance of humans on Earth, and reveals humans' biological connections with other living beings. It provides an understanding of constantly evolving viruses, bacteria, and other pathogens and enables the development of effective ways to protect ourselves against the diseases they cause. Knowledge of evolution has made possible advances in agriculture, medicine, and biotechnology.

Michael Ruse, the distinguished and prolific philosopher of biology, extended Dobzhansky's statement with a simple modification: "Nothing makes sense except in the light of evolution," a statement he always attaches to his signature. What does Ruse mean? Does he mean that evolution encompasses other scientific disciplines, such as astrophysics, physics, and chemistry? Does he mean that the concept of evolution goes beyond science and extends to art, literature, religion, and social and political institutions? And to human history and family life, including love and care? I suspect that Ruse means all of these: indeed, that as his statement says, "*nothing* makes sense except in the light of evolution."

Dobzhansky would have agreed. At the very end of his *Mankind Evolving*, Dobzhansky quotes the Jesuit anthropologist Pierre Teilhard de Chardin: "Is evolution a theory, a system, or a hypothesis? It is much more—it is a general postulate to which all theories, all hypotheses, all systems must henceforward bow and which they must satisfy in order to be thinkable and true. Evolution is a light which illuminates all facts, a trajectory which all lines of thought must follow—this is what evolution is."²

In the introduction to Part I of his 1988 magnificent collection of previously published papers, *Toward a New Philosophy of Biology*, Ernst Mayr

1. Dobzhansky, T., 1972. Nothing in biology makes sense except in the light of evolution. The American Biology Teacher 35, 125–129.

2. Dobzhansky T., 1962. Mankind Evolving. The Evolution of the Human Species. Yale University Press, New Haven, CT and London.

points out his "special concerns" about the neglect of biology in the works of philosophers of science. "From the 1920s to the 1960s, the logical positivists and physicalists who dominated the philosophy of science had little interest in and even less understanding of biology, because it simply did not fit their methodology."³ In 1961–1964, I was a PhD student at Columbia University in New York, under the mentorship of Dobzhansky. Earlier, I had three years of formal philosophical training in Spain and remained interested in the philosophical implications of my scientific research, focused on genetics and evolution. I read at the time two recently published books, *The Biological Way of Thought* by Morton Beckner (1959), a Ph.D. student of the eminent philosopher of science Ernest Nagel at Columbia University, and *The Ascent of Life. A Philosophical Study of the Theory of Evolution* (1961) by T. A. Goudge, a professor of philosophy at the University of Toronto. At Columbia, I befriended and occasionally attended the lectures of Ernest Nagel and read the two chapters dedicated to biological issues in his *The Structure of Science. Problems in the Logic of Scientific Explanation* (1961).

Most important were my frequent conversations with Dobzhansky, concerned as he was about the little attention philosophers of science were paying to the multitude of fundamental and ever-mounting philosophical issues emerging from evolutionary biology. Dobzhansky often expressed his frustration at the limited influence of biology on the thinking of contemporary philosophers. He saw that evolutionary biology raises important new philosophical issues and illuminates old ones. In 1971, we decided to convene a conference where in eight days of intense discussion such issues would be jointly explored by concerned philosophers and philosophically savvy scientists. The conference took place in Villa Serbelloni, a magnificent palace with beautiful gardens owned by the Rockefeller Foundation, in northern Italy, overlooking Lake Como, on September 9–15, 1972, including Karl Popper among the philosophers, and four Nobel Laureates, John C. Eccles, Gerald M. Edelman, Peter Medawar, and Jacques Monod. The papers presented at the conference were published as *Studies in the Philosophy of Biology* (1974). Two relatively short books were published at about the same time by two authors, Michael Ruse (*The Philosophy of Biology*, 1973) and David Hull (*Philosophy of Biological Science*, 1974), who would become over the ensuing decades two leaders among the increasing number of philosophers dedicated to the philosophy of biology since the last quarter of the 20th century.

The 17 chapters included in the present volume should be of interest to philosophy students as a textbook for a university course on the philosophy of biology, but the chapters are not intended as an encompassing treatise. The book is intended for scientists and philosophers concerned with the issues at hand, as

3. Mayr, E., 1988. *Toward a New Philosophy of Biology*. Harvard University Press, Cambridge, MA.

well as for interested general readers. Technical language has been avoided to the extent possible. The chapters can be read in any sequential order and are largely self-contained, so that an issue mostly considered in a particular chapter may be brought up elsewhere, if only briefly, whenever necessary for understanding a particular topic under consideration.

There are many scientists, philosophers, and other scholars to whom I am indebted, both intellectually and personally. Theodosius Dobzhansky, my Ph.D. mentor at Columbia University in New York, deserves particular mention. I want to express my gratitude also to Denise Chilcote, my executive assistant, who, for nearly three decades, has never failed to do whatever needed to be done as well as it could be done. I have tremendously benefited from her dedication and perfectionism.

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