

Book Review

Weinert Friedel, *Copernicus, Darwin and Freud: Revolutions in the History and Philosophy of Science*, Wiley-Blackwell, 2009

Debates concerning the import of scientific revolutions are an integral part of education in the philosophy of science. Often the main focus is on metaphysical and epistemic questions concerning the justification of scientific knowledge, (e.g., Popper, 1935; Kuhn, 1962; Bunge, 1964; Lakatos, 1970; Feyerabend, 1975; Salmon, 1989). By contrast, little or no attention is paid to the human being 'behind' the scientific revolutions or to the historic context in which the revolutions occurred. Thankfully, in this volume Friedel Weinert demonstrates not only the close connection between the advancement of scientific knowledge and philosophical ideas but introduces also some of the historic, social and human components of scientific revolutions. The volume consists of three chapters, each dedicated to one revolution in thought and its philosophical consequences, complemented by an extensive reading list and essay questions.

Chapter I (Nicolaus Copernicus: The Loss of Centrality, 90 pages) provides an overview of the significance of Copernicus' contribution to a radically new world-view. While Weinert appreciates the role of Copernicus in the shift from geo- to heliocentrism he also introduces many of the other scientists (most notably Galileo, Brahe, Kepler, Newton) who contributed to the advancement of our understanding of the cosmos. Further, he provides a detailed discussion of the philosophical consequences of this scientific revolution. This discussion supports one of Weinert's central theses of the book that "philosophical issues are inseparable from more scientific and historic concerns" (p. 16). This becomes evident especially in the discussion of presuppositions that restrict the kinds of hypotheses we are willing to consider. "A scientific revolution requires a change in perspective" (p. 21) and Copernicus provided the foundation for such a shift even though the work of others was required to complete the revolution. According to Weinert a scientific revolution is a multi-stage process that includes (1) a shift in perspective, (2) new problem-solving methods, (3) emergence of a new scientific tradition based on the

new methods and (4) convergence of expert opinion on the new tradition (p. 83). Each of these stages is discussed in the chapter.

Chapter II (Charles Darwin: The Loss of rational Design, 91 pages) introduces Darwin's most important contribution to the modern world-view, placing "all organic life, including human, under the cosh of evolutionary thinking" (p. 93). This replaced the dominant views of either (divine) design or a complete 'Great Chain of being'. Human beings had a privileged place in both views and Darwin's theory of evolution scientifically questioned this privilege. It showed how design arguments (e.g., Boyle, Paley, Maupertuis) could be overcome and substantially improved the evolutionary arguments from Lamarck. Weinert shows that Darwin was not committed to the 'survival of the fittest' dogma or the idea that evolution results in a "necessary progress towards higher forms of life" (p. 114). In addition Weinert discusses in some detail debates regarding adaptationism, heritability, and the limitations of a purely mechanistic worldview that could be inferred from the Darwinian revolution. The philosophical issues highlighted in this chapter include determinism, empiricism, emergentism, realism and issues of theory falsifiability and testability. Like in the previous chapter it becomes evident that while the name 'Darwinism' seems to implicate just one man in the scientific revolution it took the contribution of numerous other scientists (e.g., Wallace, Huxley, Agassiz, Mendel, Haeckel) to complete what we currently call Darwin's theory of evolution.

Chapter III (Sigmund Freud: The Loss of Transparency, 85 pages) deals with the work of Freud "who had a significant influence on language and thought" (p. 185). While the fact that Copernicus and Darwin made substantial contributions to science is uncontroversial the inclusion of Freud into the ranks of scientific revolutionaries may come as a surprise to many. In fact, based on the theorizing of Popper (1972) Freud's work is often presented to students as a paradigm example of pseudoscience because his theories are not falsifiable. Weinert defends the inclusion of Freud by stressing that Freudianism provides an interesting case study for the examination of the scientific status of a theory and the epistemological status of the social sciences. Because Freudianism has commitments to both its analysis helps to highlight "similarities and dissimilarities between the natural and the social sciences" (p. 187). Regarding human nature Freud rejected the commitments of the enlightenment (that man is essentially a rational animal and should

use reason to control his emotions and drives) and stressed the importance of the subconscious and the pleasure drives. Freud developed psychoanalysis (a method based on free association), which "aims at uncovering hitherto unarticulated material from the realm of the psyche" (p. 192) and linked many neurotic symptoms to suppressed sexual desires. Weinert shows that while Freud attempted to provide a scientific foundation for psychoanalytic theory he was unable to free his theory from hermeneutic models. This has important consequences for the coherence and testability of his theory. Weinert makes good on his promise to use Freudianism "as a launching pad for a philosophical consideration of the social sciences" (p. 187) and dedicates 60 of the 85 pages of the chapter to 'the social sciences beyond Freud'. Here he discusses issues ranging from the two standard models of the social sciences (the naturalistic and the hermeneutic model) to questions of methodology, the status of causation in social sciences, sociobiology and evolutionary psychology. The chapter concludes with a comparison of revolutions in science (Copernicus and Darwin) and revolutions in thought (Freud).

Weinert has provided an informative textbook that is written in a very accessible style. His examples invite the student to apply the philosophical concepts that are discussed. Since some knowledge of philosophical reasoning is presupposed this may not be the best choice for an introductory course and the choice of examples is certainly a matter of personal preference (I would have excluded Freud from the volume and focused more on the historic background of Copernicanism and Darwinism). Still, overall this should be a good supplement for advanced courses in philosophy of science.

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