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### **An Insightful Companion**

Anouk Barberousse, Denis Bonnay, and Mikaël Cozic (eds). *The Philosophy of Science: A Companion*. New York: Oxford University Press, 2018

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Any Companion may be expected to have the aim of making the reader familiar with the respective field. The preface to *The Philosophy of Science: A Companion*, edited by Anouk Barberousse, Denis Bonnay, and Mikaël Cozic, describes how this particular *Companion* approaches the task. Its aim is specified as providing something that “bridges the gap” between introductory materials and research publications (vii). The potential readers are envisioned, accordingly, as those in the position to benefit from such a bridge: advanced undergraduate or graduate students, or researchers in philosophy of science wishing to learn about areas other than their own specialisation (viii). The preface acknowledges that providing guidance to a highly specialised field requires cooperation of multiple authors but stresses the sense of unity the *Companion* aims to achieve (viii).

The *Companion* is divided into two parts. The first part contains eight chapters on major topics in general philosophy of science. In Chapter 1, Scientific Explanation, Bonnay covers the deductive-nomological model and counterexamples to it, and alternatives such as causal and unificationist accounts of explanation. In Chapter 2, Confirmation and Induction, Cozic introduces paradoxes of confirmation, instantialist and hypothetico-deductive accounts of confirmation, and,

most prominently, the Bayesian approach to confirmation and induction. In Chapter 3, Causality, Max Kistler deals with Russell's "eliminativism" and deductive-nomological analysis of causality and then provides an overview of approaches to causality in terms of counterfactual conditionals, processes, probabilistic analysis, and manipulability. In Chapter 4, Metaphysics of Science as Naturalized Metaphysics, Michael Esfeld demonstrates the consequences, if any, of Newton's mechanics, the special theory of relativity, and quantum mechanics, for metaphysics. In Chapter 5, Theories and Models, Marion Vorms lays out the syntactic and the semantic approaches to analysing the content of theories as well as alternative accounts that focus on models and representations in theorising. In Chapter 6, Scientific Change, Barberousse and Vorms discuss the (dis)continuity of scientific change, the notion of progress, the driving forces behind the change, and whether the change is necessary and rational. In Chapter 7, Philosophy of Science and Science Studies, Barberousse focuses on the methodological disagreements between philosophy of science and science studies. Social epistemology is another significant topic discussed. In Chapter 8, Reduction and Emergence, Pascal Ludwig presents various non-reductionist and reductionist approaches and their difficulties.

The second part of the book consists of nine chapters on philosophies of the special sciences. In Chapter 9, Philosophy of Logic, Philippe de Rouilhan shows how three different logics deal with the issues raised by proper names, definite descriptions, and expressions of propositional attitude. In Chapter 10, Philosophy of Mathematics, Bonnay and Jacques Dubucs present a variety of approaches, anti-realist, realist, and naturalist, to issues such as mathematical objects and mathematical knowledge and practice. In Chapter 11, Philosophy of Physics, Barberousse focuses especially on the questions of measurement, probability, models, and the use of computers in physics. In Chapter 12, Philosophy of Biology, Thomas Pradeu introduces seven major problems in the philosophy of biology, including the status of the theory of evolution, the issues of function and development, and the problem of reductionism. In Chapter 13, Philosophy of Medicine, Élodie Giroux and Maël Lemoine cover the topics of defining health and disease, philosophy of science

issues such as causality in medicine, and issues raised by clinical reasoning. In Chapter 14, Philosophy of Social Sciences, Jon Elster and H  l  ne Landemore discuss the status of laws in the social sciences and methodological individualism, among other topics. In Chapter 15, Philosophy of Economics, Cozic gives an overview of various positions concerning the methodology of orthodox economics and also discusses approaches such as experimental economics. In Chapter 16, Philosophy of Cognitive Science, Daniel Andler covers a variety of issues including the modularity hypothesis, and the foundations of the cognitive science and the role of philosophy in cognitive science. In Chapter 17, Philosophy of Linguistics, Paul   gr   focuses on themes such as scientific change, explanation, and hypothesis development in linguistics, as well as universality, with generative linguistics as the main subject.

As promised in the preface (ix), one theme running through the chapters in the second half is the relation between the philosophy of some special science and the general philosophy of science: for example, what form general philosophical issues such as the use of models, reductionism, or explanation take in the philosophy of a special science.

As even my briefest of overviews shows, the chapters, especially on the philosophy of special sciences, exhibit a variety of ways to introduce a field. Seeing this variety in action was for me a source of additional interest.

Predictably, I was also interested to see the presentation of the field where I mostly work, social aspects of science. Barberousse's chapter, Philosophy of Science and Science Studies, begins with an overview of the relationship between the philosophy of science and science studies, which is seen as confrontational, and is often characterised by the failure of opponents to notice the diversity of each other's views. Barberousse suggests that a more fruitful relationship is possible: "contrary to appearances, philosophy of science can benefit from opening a dialog with science studies, and vice-versa" (262).

Issues raised by the history of science play a prominent role in the discussion of the first theme of the chapter, the disagreements (ultimately of a philosophical nature) between the two

approaches to analysing science. First, there is the dilemma for the philosopher: either to give up philosophy and study history of science as a historian or to risk an accusation of perpetuating an inadequate philosophical picture of science based on an inadequate picture of its history. Second, there are the arguments about the historically changing nature of presumably universal philosophical concepts, such as rationality. Finally, there are alternative methodological proposals for studying science, the Strong Programme being a prominent example. In response, Barberousse argues that due to the epistemological and methodological presuppositions that arguments in science studies involve, presuppositions which call for critical philosophical analysis, science studies still leaves important work for philosophy of science and does not constitute a problem-free alternative to it.

The second section, which is more brief, discusses the philosophers' acknowledgement of the collective dimension of science, such as the importance of testimony and collaboration, and the emergence of "philosophical" social epistemology alongside the longer standing tradition of research on these issues in science studies. According to Barberousse, this is a field where the two could be in beneficial contact.

Finally, and very briefly, the chapter asks whether philosophy of science should cooperate more closely with other fields, for instance, political philosophy, inspired by the interest of science studies in studies of politics and culture. Barberousse points out reasons for scepticism, referring to the challenge for science studies researchers to justify their view of science as amenable to such treatment.

I share the conviction that fruitful interaction between philosophy of science and science studies is possible. Barberousse's discussion of several classical works in social epistemology showing the fruit of the newer orientation of philosophy of science, including those by (earlier) Philip Kitcher and Alvin Goldman, gives weight to this promise. I would also add examples from a different strand of philosophers' attempts to overcome the conflict and synthesise insights from the two fields. Helen Longino, (later) Kitcher, and Heather Douglas are some examples.

The brief summaries above aim to give an impression of the content, and the approach, of the *Companion* as it pursues its substantive aim of familiarising the reader with contemporary philosophy of science. The characterisation given to the *Companion* in the preface seems fitting as well. With its relatively small number of long chapters – seventeen chapters occupy 726 pages of the book – it indeed leaves a different impression compared to the disunity of an encyclopaedia. The assessment of the expected level of the reader also feels accurate: the *Companion* may be most suitable for someone who already has some knowledge of philosophy of science and familiarity with examples from the special sciences discussed.

There is one thing I found somewhat disappointing with the *Companion*: the note in the acknowledgements, according to which an earlier version of the book appeared as *Précis de Philosophie des Sciences* in 2011, made me wish to see a separate preface for this English version. From a practical point of view, for example, someone preparing a reading list, it might be good to know what changes were made between the versions. Less practically, I would like to know how the editors and the authors see the two books.

The *Companion* is what it explicitly aims to be, a guide to lead the reader into the philosophy of science. In addition, the *Companion* allows the reader a glimpse of philosophy of science that was not originally written for the Anglophone audience. This reader, for one, would be grateful for an opportunity to learn more.

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