Steven French and **Juha Saatsi**, eds.
The Continuum Companion to the Philosophy of Science.
London-New York: Continuum 2011.
452 pages
$190.00 (cloth ISBN 978–1–4411–8761–1)

Among the various branches of philosophy, the philosophy of science can be considered one of the most recent but, at the same time, also the one that has experienced both the most impressive development and academic acknowledgment. The literature on the philosophy of science is boundless and its relevance for issues concerning human knowledge is nowadays well recognized. Obviously, this does not mean that the field of philosophy of science would be exhausted: some of the most urgent problems in theories of science are ones concerning the relationship between the history of science and the philosophy of science, science and metaphysics, the role of models, and so on. This *Continuum Companion to the Philosophy of Science*, edited by Steven French (Professor of Philosophy of Science at the University of Leeds, UK) and Juha Saatsi (Lecturer in Philosophy at the University of Leeds, UK), aims to provide an overview of issues concerning philosophy of science on multiple levels. The volume, written by illustrious scholars, divides into four parts.

The first part, entitled *Philosophy of Science in Context*, contains essays concerning the relationship between philosophy of science and neighboring disciplines such as epistemology, metaphysics, and the history of science.

Alexander Bird, with his essay entitled "Philosophy of Science and Epistemology", analyzes the first relationship, taking into account two tendencies: the *particularist* and the *generalist*. The former claims that "philosophy of science needs to be true to the (at least apparently) distinctive and even arcane practices of actual scientists" (15). Bird calls this tendency *particularist* just because "it tends to emphasize the particular, special nature of science (and maybe even of the individual sciences)". According to the latter approach, which Bird dubs *generalist*, by contrast, philosophy of science "needs to relate its account of scientific belief to the entirely general account of knowledge and justification provided by epistemology". The first tendency according to Bird is exemplified by William Whewell; the second, by John Stuart Mill.

Craig Callender examines the relationship between philosophy of science and metaphysics in an essay that again bears that very name. Philosophy of science has rarely enjoyed a particularly friendly relationship with metaphysics: nonetheless, if we are to believe Callender's historical reconstruction, distinct metaphysical assumptions often drive "revolutionary science" – for instance, those concerning absolute simultaneity, infinitesimals, and so on (50).

Don Howard in his eponymous essay analyzes the relationship between "Philosophy of Science and the History of Science". Howard's stance is that it is impossible to analyze issues concerning philosophy of science without taking into account the historical background of the discipline: Howard in his essay takes inspiration from Norwood Russell Hanson's words to the

effect that "History of science without philosophy of science is blind. Philosophy of science without history of science is empty" (55).

The second part, entitled *Current Research and Issues* and divided into two sections, *General Issues in Philosophy of Science* and *Philosophy of Particular Sciences*, opens with Stathis Psillos's essay entitled "Scientific Realism with a Humean Face". Psillos canvasses the debate surrounding scientific realism, starting with the verificationist criterion of meaning posited in the early 20th century.

Ned Hall analyzes the link existing between causation and the sciences while Gabriele Contessa ("Scientific Models and Representation"), Sven Walter along with Markus Eronen ("Reduction, Multiple Realizability and Levels of Reality"), Henk W. de Regt ("Explanation"), Malcolm R. Forster ("Scientific Evidence") and James Hawthorne ("Bayesian Confirmation Theory") take account of some relevant issues in the contemporary philosophy of science and epistemology, that is to say the role of models and idealization in science, the problem of reduction, explanation, scientific evidence, confirmation theory, and so on.

The second section of Part Two opens with Nick Huggett's essay simply entitled "Philosophy of Physics". Huggett begins by presenting what he calls the three pillars of contemporary physics: the first one is General Relativity together with Spacetime Theories, the second one is Quantum Mechanics, while the third one is Statistical Physics. Huggett offers this delineation because he assumes that the reader does not possess the necessary knowledge to appreciate contemporary physics: his presentation, it is said, "emphasize a philosophical understanding of the material" (221).

In his essay "Philosophy of Biology" Ingo Brigandt scrutinizes this very popular theme in contemporary philosophy of science. In his own words, Brigandt highlights "what implications biology has for some *issues in general philosophy of science*, including natural kinds, conceptual change, discovery and confirmation, explanation and reduction, and naturalism" (247). The implications are significant indeed.

Very interesting is Carl F. Craver's and David M. Kaplan's essay entitled "Towards a Mechanistic Philosophy of Neuroscience" – this because it can be seen as something of a novelty in the genre of collective works on philosophy of science. According to Craver and Kaplan, neuroscience is interesting to philosophers of science for at least three reasons: "First, neuroscience is immature in comparison to physics, chemistry and much of biology and medicine. […] Many of its basic concepts, techniques and exemplars of success are under revision simultaneously. Neuroscience thus exemplifies a form of scientific progress in the absence of an overarching paradigm. Second, neuroscience is a physiological science. Philosophers of biology have tended to neglect physiology. Physiological sciences study the parts of organisms, how they are organized together into systems, how they work and how they break. Its generalities are not universal in scope. Its theories intermingle concepts from several levels. Neuroscience thus offers an opportunity to reflect on the structure of physiological science more generally. Finally, unlike other physiological sciences, neuroscientists face the challenge of relating mind to brain" (268). Finally, section two ends with Robert Findlay

Hendry's essay on "Philosophy of Chemistry" and Christopher Pincock's "Philosophy of Mathematics".

Part three, *Past and Future*, launches with an essay carrying the title "Travelling in New Directions", written by the editors. Their essay "discusses some emerging trends, new directions and outstanding issues in philosophy of science" (337). In actuality, the authors analyze how philosophy of science is connected with analytic philosophy, history of science, etc. Furthermore, they take into account some contemporary issues that cannot be avoided in the epistemological area, such as the realism debate and the question of models and idealization in science.

The third section ends with Peter Vickers's essay entitled "A Brief Chronology of the Philosophy of Science". This is a very useful and detailed essay concerning the historical path taken by the philosophy of science. Vickers begins with Aristotle, whom he considers the "first real philosopher of science" (359). His periodization marks out stretches of time extending from Bacon to Kant, from the 1840 to the 1910s, and from the 1920 to the 1940s before settling on individual decades: first the 1950s, then the 1960s, the 1970s, the 1980s, and finally the 1990s.

The fourth part of the volume is entitled *Resources.* It contains an annotated bibliography, a listing of research resources, and, finally, a very useful A-Z of key terms and concepts.

Because all the essays also touch upon recent issues in the philosophy of science, this book acts not only as an introduction to newcomers but also as a handy resource for specialists.

Giacomo Borbone
Catania University