Juha Saatsi, ed. *The Routledge Handbook of Scientific Realism.* Routledge 2018. 456 pp. $176.00 USD (Hardcover ISBN 9781138888852).

Can science tell us what the world is really like? The scientific realist provides us with the positive answer that this is indeed what science does; giving us a picture of what the world is really like. The scientific antirealist on the other hand doesn't share his opponent's optimism on this.

Probably the best known and most famous argument for scientific realism, the 'no miracles argument', comes from Hilary Putnam. '[T]he positive argument for realism is that it is the only philosophy that does not make the success of science a miracle. That terms in mature scientific theories typically refer, that theories accepted in mature science are typically approximately true, that the same terms can refer to the same even when it occurs in different theories - these statements are viewed not as necessary truths but as part of the only scientific explanation of the succes of science, and hence as part of any adequate description of science and its relations to its objects'(*Mathematics, Matter and Method*, Cambridge University Press, 1975).

As a first approximation scientific realism can be characterised as a positive attitude toward what our best scientific theories tell us about the world. It is the view that well-confirmed scientific theories are approximately true; the entities they postulate do exist; and we have good reason to believe in them. The strong metaphysical, semantic, and epistemic claims of scientific realism are contested by numerous forms of scientific antirealism in a debate that has carried over the last decades.

The Routledge Handbook of Scientific Realism (RHoSR), edited by Juha Saatsi, is with its 37 chapters spread out over 456 pages the first, and very welcome overview of the past and current debates regarding scientific realism with contributions by leading scholars from the realist as well as from the anti-realist side.

RHoSR consists of five parts, respectively on the historical development of scientific realism, the core issues and positions, the contemporary debate, scientific realism and the different scientific disciplines, and the last part on the broader reflections of the current debate.

Part 1 offers a historic overview of the development of scientific realism starting with the period of logical empiricism and ending with what is sometimes called the 'realist turn' of the 1960s and 1970s. In his contribution to RHoSR Matthias Neuber makes a strong case for the view that one should not look at logical empiricism as juxtapositional to scientific realism but instead of that look at it as 'a pioneering movement towards the realistic tendencies in the second half of the 20th century' (17). In his chapter Stathis Psillos gives a thorough overview of the development of the realist stance since the 'realist turn'. A development that lies at the heart of much of today's discussion on the subject.

In 9 chapters Part 2 of RHoSR explores some of the core issues, traditional topics and controversies in the scientific realism debate. Written by leading scholars in the field these chapters offer a contemporary view of these traditional topics. The most well known of these topics concern on the one hand the issue of the underdetermination of theories by data ('Duhem-Quine) and on the other hand the historical challenges to scientific realism put forward by for example Larry Laudan's pessimistic induction thesis and the discussion revolving around Thomas Kuhn's The Structure of Scientific Revolutions.

The 10 chapters of Part 3 deal with contemporary themes that have dominated the scientific realism debate over the past decades. The emergence of these shift in themes in the debate is partly the result of increasing specialisation in philosophy of science. A reflection of this can be found in Leah Hendersons chapter on global versus local arguments for realism. Another shift in the themes of the debate can be found in the increasing interest in the use of models and simulations. The fact that not all contemporary themes and debates are new is for instance reflected by Kyle Stanford's contribution on the problem of unconceived alternatives which can be read as an extension of reformulation of Laudan's work on pessimistic induction. Other chapters in this part are on issues of the position of scientific realism in debates involving perspectivism, explanation, scientific progress and succes, and social epistemology.

The focus in Part 4 of RHoSR is on the connection between topics in scientific realism in the context of some specific sciences. It can be read as an elaboration on the theme of global versus local realism in part 3. Over the years philosophy of science has evolved from concentrating on issues of general philosophy of science to an increasing interest in the philosophies of the specific sciences. With chapters on themes from scientific realism and anti-realism in connection with sciences as diverse as high-energy physics, quantum mechanics, cosmology, history, earth sciences, chemistry, cognitive science, and economics it offers a very insightful view of the direction may evolve in the years to come. As might be expected all the main issues from within the scientific realism debate are touched upon and it is really very interesting to learn how these issues are dealt with in the specific sciences. Where for instance underdetermination might be a key issue for one science it might be an issue of little or none importance for another of the specific sciences. What this part of RHoSR shows is that the step from a general and global philosophy of science to the local philosophy of the specific sciences opens up a world of new perspectives where issues are not so straightforward as is suggested in the global view.

As mentioned in the introduction of this review scientific realism makes some strong metaphysical, semantic, and epistemic claims. The 5 chapters of Part 5 take a closer look of these claims seen from the light of theories of truth, epistemology, philosophy of mathematics, philosophical naturalism, metaphysics, and natural kinds. To give a flavour of what to expect in this part some words on the chapters on truth and metaphysics. It is often thought that scientific realism is closely linked to the correspondence theory of truth. In his chapter on realism and theories of truth Jamin Assay argues that it is '[c]rucial to the realist position that science succeeds (or aims to succeed) at discovering the (approximate) truth about reality, though it may be indifferent as toe whether the correct theory of truth is offered by correspondence of deflationary theories' (303). In his chapter on metaphysics where he investigates the question 'to what extent should our realism be metaphysically informed?' (305) Steven French ends with the conclusion that '[w]hat is the alternative to the appropriation of some form of metaphysics by the realist? She can step out of the pool altogether and thereby abandon her realism, perhaps joining the spare ranks of the anti-realists. Or she can remain in the "shallow" end, insisting that she is indeed a realist about the unobservable features of the world that science presents but resolutely refusing to articulate that realism in any but the most 'vanilla flavoured' terms' (404).

The Routledge Handbook of Scientific Realism should be compulsory reading for anyone interested in the debates about scientific realism. Written by leading scholars in the field it offers the reader an outstanding view of the different positions

within the debate as well as some interesting insights of the direction in which the debate may take us in the years to come. It is an excellent companion for both researchers and students specialising in metaphysics and philosophy of science. All the credits go to Juha Saatsi, the editor of this volume, who in his introduction expresses his hope that the collection might server as a guide 'for anyone interested in cutting-edge philosophical reflection on the nature and extent of scientific knowledge' (4). He has done a marvellous job in bringing together this fine collection of papers. The Routledge Handbook of Scientific Realism should have a prominent position on the bookshelf of every philosopher of science.

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