Brit. J. Phil. Sci. **65** (2014), 899–903

REVIEW

DON ROSS, JAMES LADYMAN, AND HAROLD KINCAID (*eds*) *Scientific Metaphysics* Oxford: Oxford University Press, 2013, 256 pp., £35 (hardback), ISBN: 978-0199696499

Katherine Brading and Xavi Lanao
Department of Philosophy, University of Notre Dame, 100 Malloy Hall, Notre Dame, IN 46556, USA
kbrading@nd.edu or jlanaoca@nd.edu

What is 'scientific metaphysics', and why might we need such a thing? There is no univocal answer to be found among the pages of this volume. Rather, this collection should be regarded as an attempt to probe the sources of dissatisfaction many philosophers of science feel with respect to contemporary analytic metaphysics and to offer concrete proposals on how these might be addressed.

This reaction against analytic metaphysics is not a neo-positivist dismissal of metaphysical concepts as meaningless; on the contrary, the reaction comes not least from metaphysically inclined philosophers. Chakravartty (Chapter 2) argues that any philosopher of science with minimal realist commitments will inevitably find herself dealing with concepts (such as properties, causation, laws of nature, *de re* modality, and so forth) whose analysis seems far removed from the details of scientific practice and which lead her into engagement with metaphysical theorizing. But when turning to the metaphysical literature, the philosopher of science most often does not find what she is looking for, despite the apparent overlap of subject matter between philosophy of science and metaphysics; frustration with contemporary analytic metaphysics sets in. The problems seem to arise from the questions and methodologies that dominate contemporary analytic metaphysics, and a closer look at these perceived problems helps to shed light on the motivations that generate a call for a different kind of metaphysics: a 'scientific metaphysics'.

Although all philosophers rely on intuitions and empirical input in order to reason about the world, several authors in this volume argue that the

doi:10.1093/bjps/axt061

Advance Access published on June 17, 2014

methodologies for doing so employed by analytic metaphysicians can be problematic. Humphreys (Chapter 3) argues that analytic metaphysics is flawed methodologically, in its use of intuitions, in too often drawing wide-scope conclusions from a domain that is narrow. A compelling example he offers is scale variance. Human experience has turned out (as a matter of contingent fact) to be an unreliable guide to ontology at very small and very large length scales. Indeed, more generally, extrapolation along scales of size, temperature, resistance, mass, and so forth can be a risky business, as the example of superconductivity (p. 69) makes vivid. Another example he offers concerns extension beyond our experience, such as by extrapolation, to the 'idealized cognizers' sometimes appealed to in making 'in principle' claims. Humphreys argues that without careful attention to the relationship between such 'idealized cognizers' and the actual human abilities that form the source of the idealization, we cannot evaluate whether and to what extent our wide scope 'in principle' claims are justified. A methodology that allows inferences from narrow to wide scope without careful attention to contingent empirical limitations on the validity of such inferences, yet which seeks to arrive at conclusions concerning ontology beyond the reach of valid inferences, is inherently problematic. In similar vein, Dennett (Chapter 5) argues quite generally that the tools and methods of contemporary analytic metaphysics are better suited to a 'philosophy of the manifest image' than to the task of moving from intuitions to claims about the underlying nature, structure, and/or composition of the world. Together, these chapters make a detailed and (in our view) persuasive case that there is a mismatch between some of the aims of contemporary analytic metaphysics (the types of claims and conclusions that metaphysicians are seeking to establish) and its methodologies.

The role that intuitions play is one source of frustration with contemporary analytic metaphysics highlighted by this volume. A second is conceptual conservatism. In a very interesting exchange between Wilson (Chapters 7 and 9) and Friedman (Chapter 8), we are invited to revisit the roots of contemporary analytic philosophy in the scientific crises of the late-nineteenth and early-twentieth centuries, and to recover lessons learned. Most importantly, responding to these crises demanded that concepts (such as those of distance, time, and mass) be allowed to evolve, change, and develop under the demands of the practice of science. This 'conceptual liberty' conflicts with the view that the content of a concept can be fully explored by introspection and in a timeless fashion.

One method for achieving 'conceptual liberty' is the adoption of a Hilbert-style implicit definition approach to the concepts of our scientific theories. Wilson sees this at work in Michael Friedman's 'relativized *a priori*'. Friedman argues that some scientific concepts are necessary for a theory to be empirically meaningful while not themselves being connected to the

empirical world: they are introduced *a priori* as necessary requirements for the articulation of the theory. He illustrates this point by highlighting the indispensability of concepts such as absolute space, time, and motion in Newton's project in the *Principia*, while emphasizing that those concepts bear 'no possible causal relation to our senses' (p. 192). However, Wilson argues that proper engagement with the sciences cannot be limited to implicitly defining concepts by a 'logically articulated' scientific theory. This practice not only underplays the complexity of scientific theorizing, but also chains the concepts to logical relations that (contrary to the desired objective) overly constrain their liberty. He argues instead that we must pay attention to the detailed behaviour of concepts as inferential tools in highly localized settings. Wilson and Friedman suggest that their projects may be complementary rather than competing, but more needs to be said about how that would go. One point of common contact is their rejection of Quinean holism, the adoption of which encourages, they argue, a blindness to the ways in which a given concept or principle may differ dramatically and crucially from another in its status, role, and behaviour within scientific theorizing.

According to the diagnosis in Wilson and Friedman's chapters, contemporary analytic metaphysics goes wrong in at least two ways. First, in failing to pay sufficient attention to the details of contemporary science, analytic metaphysicians risk artificially ossifying our concepts and at the same time imposing on them a false precision. Moreover, according to Wilson, they overgeneralize the inferential behaviour of concepts that is, in scientific practice, localized and highly context-sensitive. Second, analytic metaphysicians can be insufficiently humble with respect to their imaginative capacities: 'all of logical space' does not fall within our purview. The radical conceptual developments of one hundred years ago involved the discovery of new regions of logical space and we have no good reason to think that this process of discovery is anywhere near 'complete'.

In sum, this volume identifies two main sources of dissatisfaction with contemporary analytic metaphysics: conceptual conservatism and high levels of reliance on intuitions. Getting clear on the sources of dissatisfaction with contemporary analytic metaphysics is, however, only the first step towards the development of a scientific metaphysics. What might such an enterprise look like? As Chakravartty (Chapter 2) emphasizes, a vague feeling that metaphysics ought to be somehow more closely connected to empirical work carried out in the sciences, whether through attention to its results or to its methodology or both, doesn't get us very far in attempting to distinguish analytic metaphysics from scientific metaphysics. On the one hand, science contains its share of reasoning that is far removed from direct empirical engagement and, on the other hand, 'mere compatibility' with current science falls far short of what advocates of scientific metaphysics envisage. What else

should be required? For Ladyman and Ross (Chapter 6), scientific metaphysics is a unification project 'directly motivated by and in the service of science' (p. 109). In their chapter, they explore connections between their project and recent work by Oxford physicist David Deutsch; they diverge from Deutsch in embracing an ontology in which the world is 'the totality of non-redundant statistics' (p. 146), but share with him the emphasis on searching for a unified account of the sciences that goes beyond the results of these specific sciences. For Wilson, on the other hand, such a unification project fails to take into account the piecemeal practices of science, these being exactly where scientific philosophy should be focussing its attention. Methodological disagreement between the proponents of scientific metaphysics is not necessarily a bad omen. As Ismael suggests (Chapter 10), scientific metaphysicians may do well to embrace a methodological pluralism given that there is unlikely to be any one template for what counts as scientific metaphysics.

Melnyk (Chapter 4) focusses his attention on the Ladyman and Ross project (especially their ([2007], Chapter 1)), emphasizing the interrelation between the project of scientific metaphysics and science itself. This raises an important question about the relationship of this project to science: if scientific metaphysics is a naturalization project, then should it be judged by its contributions to science? If so, then it is not clear that philosophers, rather than scientists, are best placed to carry out the project. If not, then what exactly is the project, and what are the standards by which it should be judged? This worry about 'scientific metaphysics' is a theme that runs, more or less explicitly, through several of the contributions, including Chakravartty (Chapter 2), Melnyk (Chapter 4), and Ladyman and Ross (Chapter 6). In our opinion, the scientific metaphysician who finds herself wishing to be judged by her contribution to science rather than to philosophy is on a hiding to nothing. She must be held accountable to the questions, methodologies, and standards of her own discipline; and she must make her case for where, when, and to what extent the details of a particular aspect of science are relevant to the philosophical question with which she is engaged. Ismael's contribution (Chapter 10) is a refreshing example of exactly this.

Ismael traces the evolution of causal notions in science, arguing that the concept of cause 'has undergone a quiet transformation in science that not all philosophers are aware of'. In her account, scientific metaphysics is distinguished from analytic metaphysics in both its methods and its goals. Rather than offering an analysis of the everyday notion of cause via armchair reflection on intuitions, an explication of the scientific notion is offered. As part of this explication, the everyday notion is shown to be a crude and imprecise ancestor of the current scientific concept that has been refined and transformed through the labour of scientific practice. Her chapter includes some general reflections on scientific metaphysics and how it differs from

contemporary analytic metaphysics, providing a fitting conclusion to the volume.

Engagement with this provocative collection of essays encourages the following viewpoint: We need metaphysics because making sense of scientific activity in many cases requires making sense of metaphysical concepts such as cause, substance, or property. Nevertheless, a metaphysical analysis of these concepts detached from the details of scientific practice will not serve our needs. We need a scientific metaphysics because the nitty-gritty details of scientific theory and practice matter for philosophical questions concerning the nature, structure, and/or composition of the world, as well as for the concepts that we use in reasoning about the world. This is so both with respect to the substance of the claims being argued for and with respect to appropriate methodology. Moreover, simply adding more scientific knowledge to one's existing philosophical practices will not address the problem; we must revise those practices in the light of developments in science. The overall message of this book is that philosophers of science have good reasons to seek an alternative metaphysics, transformed by serious reflection on methodology and by close engagement with science. Anyone interested in relationships between metaphysics and philosophy of science will want to explore this book.

Reference

Ladyman, J. and Ross, D. [2007]: *Everything Must Go*, Oxford: Oxford University Press.