

A Metaphysics for Scientific Realism: Knowing the Unobservable, by Anjan Chakravartty. Cambridge: Cambridge University Press, 2007. Pp. xvii + 251. H/b £47.00, e-Book USD68.00.

In *A Metaphysics for Scientific Realism*, Anjan Chakravartty attempts the difficult task of bringing metaphysical debates about properties, causation, and natural kinds into a meaningful engagement with epistemological debates about scientific realism. Overall, he does an excellent job, and for that reason alone, this book is worth reading.

Chakravartty's primary aim is to defend a theory that he calls 'semirealism', which is effectively a metaphysically enriched variant of structural realism (SR). Structural realists, like all realists, regard successful scientific theories as likely to be true. But they are selective in which parts of scientific theories they treat in this way. They suggest that we should treat only claims about the *structure* of reality as true. Claims about the 'nature' of reality—in contrast—should be regarded as much less epistemically secure. *Epistemic* structural realists endorse the existence of non-structural features of reality, but maintain scepticism that we know about these features. *Ontic* structural realists take the more radical step of denying the existence of such non-structural entities.

Chakravartty's proposed semirealism is inspired by the belief that both epistemic and ontic SR are subject to serious difficulties. With respect to epistemic SR, the difficulty turns out to be merely an ad hominem objection to epistemic structural realists past. According to Chakravartty, these theorists have understood structure in an excessively formal fashion; as a higher order property of relations, rather than simply identifying structure as the network of relations instantiated by concrete objects (p. 37).

Ontic SR is criticized on different grounds. In the first place, Chakravartty believes its rejection of concrete particulars is not supported by sufficiently strong arguments. Ontic structural realists are concerned that quantum mechanics underdetermines the nature of quantum particles, and thereby that there is no empirical basis to assert the existence of concrete particulars at this most fundamental level. Chakravartty suggests, however, that physics also underdetermines the identity of macroscopic objects—it does not, for instance, clearly mandate either a bundle or a substratum account of objects. But underdetermination of this sort does not constitute sufficient grounds to abjure belief in objects altogether (pp. 73–4). Hence, mere underdetermination by physics is not enough to warrant metaphysical abstinence.

Even if we think there is more than this to be said in favour of ontic SR, Chakravartty believes the view is subject to a dire metaphysical difficulty of its own: it posits relations without relata (pp. 84–5). On a priori grounds, it would appear, Chakravartty deems this to be untenable.

So what distinguishes semirealism from these structural realist alternatives? First, Chakravartty is keen to emphasize a difference in how he conceives of

the structure that is revealed by science. It is the structure of causal relationships between objects that is revealed (p. 62), not merely the higher order structure, instantiated by the network of causal relationships itself. Second, Chakravartty advocates a causal theory of property identity, whereby the identity of a property is given by its dispositions to enter into causal relations. This account, echoing the work of Shoemaker, Ellis, and others, allows Chakravartty to claim that, in knowing the structure of causal relations, we thereby acquire a knowledge of which properties are instantiated (pp. 62–3). Third, he proposes a ‘very specific form of ontological relativism ... From a realist perspective, one might well regard these [ontological categories of natural kinds and particulars] as different, basic accounting methods for keeping track of the same mind-independent stuff’ (p. 83).

Chakravartty’s discussion of the way in which his causal theory of properties may deliver epistemic benefits is not entirely convincing—principally because he fails to engage with some recent objections to this sort of claim. (I believe this is due, at least in part, to the book’s production unfortunately coinciding with the appearance of many important papers on the topic, springing from David Lewis’s ‘Ramseyan Humility’—circulated as a pre-print since 2001, but not published until 2009 in Braddon-Mitchell and Nola, eds, *Conceptual Analysis and Philosophical Naturalism*, Cambridge, MA: MIT Press.) The most obvious difficulty with the proposal is that, even if the pattern of causal relations is determined by the dispositional properties of things, it does not follow that the determination runs the other way. A given pattern of causal relationships could—presumably—be compatible with any number of configurations of dispositional properties, differing only in the dispositions which go unmanifested (for a more recent discussion, see also Jennifer McKittrick, ‘Dispositions, Causes, and Reduction’, in Handfield (ed.) *Dispositions and Causes*, Oxford: Clarendon Press, 2009, Sect. 2.3). In light of this, the epistemological benefits of the dispositional account of properties may be less impressive than anticipated.

As for the third metaphysical feature—Chakravartty’s account of kinds and particulars in somewhat conventionalist terms—while the account is intrinsically appealing, it is somewhat disappointing to note that it does not differ very much from ontic SR. Consider the following passage:

Descriptions of particulars are often given in terms of descriptions of dispositions that are relevant to particular kinds of interactions, measurements, and so on. Often, the very same properties can be investigated in different ways, and the results are best described in terms of different ontological categories of particulars. (p. 84)

It is not very hard to imagine this coming from the mouth of an ontic structural realist. So where is the difference? Alive to this threat, Chakravartty suggests that what is crucially important is that he rejects the structuralist claim that entities are ontologically posterior to the structure that yields them. For Chakravartty, the dispositional properties that stand in a network of causal relations are ontologically at least as basic as the causal

relations themselves (pp. 84–5). This harks back to the rejection— noted above— of relations without relata. Given that this is a crucial factor differentiating semirealism from its nearest opposition, however, it would have been good to read more as to why this view is thought superior.

Turning away from these concerns in the thickets of scientific realism, there is a broader concern one might have about the dialectic in play. In a sense, scientific realism has been the background presupposition of much metaphysical inquiry for the last three decades or more. By accepting a realist attitude to scientific discourse, one is given licence to offer ontological interpretations of scientific theories. The strategy is roughly: ‘Given science is broadly true, the world must contain *this* sort of stuff.’ So we are familiar enough with the idea of a metaphysics that springs *from* scientific realism. Why would we need, then, a metaphysics *for* scientific realism? At times, Chakravartty’s thought appears to be that the knowledge claims of science can be given a surer footing if we adopt his preferred understanding of the nature of reality. Contemporary accounts of scientific realism are problematic: and the problems are to be fixed *in ontology*. ‘Given the world contains *this* sort of stuff, the claims of science are broadly true.’

As my flippant characterization indicates, there is a danger of circularity here, at least if one attempts to endorse both arguments as simultaneously persuasive. In this regard, I think Chakravartty does himself a disservice by his title. Rather, it is better to understand his metaphysics as one which is developed to *cohere with* the best possible account of scientific realism. As he is keen to stress: formulations of scientific realism have ‘evolved’ so as to respond to the pessimistic meta-induction on past science. It is incumbent on the scientific realist to give a non-vacuous account of which parts of scientific theories are likely to endure through theory-change, and therefore are most likely to be true.

To this end, he is largely successful, and makes a genuine contribution. By focusing on the ways in which science makes claims about the causal structure of the world, Chakravartty has identified a variety of realism that has a good prospect of escaping the pessimistic meta-induction, and which does so in a non-vacuous way. Building on that, he engages in fruitful metaphysical speculation about the sort of ontology which best fits these causal strictures. So the slogan of the book is perhaps best reduced to: ‘Given that some parts of scientific theories are more likely to be true than others, the world is especially likely to contain *this* sort of stuff, rather than *that*.’

Considered purely as a piece of metaphysics, Chakravartty’s account of natural kinds (Ch. 6) is a stimulating challenge to Brian Ellis’s ‘New Essentialism’, which insists that (i) there is a unique taxonomy of natural kinds and (ii) all natural kinds are characterized by essences, possessed by all members of that kind. Chakravartty denies both these claims, and plausibly argues that such a rich metaphysics of kinds is neither necessary nor desirable. Those interested in dispositional essentialism and anti-Humean accounts

of natural necessity will benefit from engaging closely with this part of the book.

In addition to these—which seem to me the most important features of the book—there are some helpful and interesting passages regarding: *ceteris paribus* laws; the nature of scientific theories and models; and whether or not natural laws should be characterized as ‘metaphysically necessary’. I am pleased to be able to recommend the book warmly, especially to those interested in scientific realism, but also to those interested in the metaphysics of natural properties, causal laws, and natural kinds.

School of Philosophy and Bioethics
Monash University
Victoria 3800
Australia

TOBY HANDFIELD

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Time and Realism: Metaphysical and Antimetaphysical Perspectives, by Yuval Dolev. Cambridge, MA: MIT Press, 2007. Pp. ix + 237. H/b £48.5, P/b £19.95.

The subject of this book is the passage of time, and as Yuval Dolev notes, ‘[f]or philosophers there is initially one question: does time really flow or is time’s passage merely an illusion? This is at once the most serious and the least comprehensible question in the metaphysics of time’ (p. 1). But Dolev does not answer this question, at least not directly. His aim is rather to show that it makes a crucial assumption, the one it shares with the two main theories that attempt to answer it. That assumption is an ontological one: that real differences between past, present, and future have implications for what actually exists. That assumption, he argues, cannot ultimately be made intelligible. So both answers to the question collapse, and since the original question is given content only by those answers, it too dissolves. This does not make talk of the passage of time meaningless, however, for what remains once the theoretical confusion is cleared away, is a rich phenomenology, in terms of which our ordinary talk of the passage of time, the openness of the future versus the fixity of the past, the privileged moment of time that is the present, and so on, all makes sense.

This journey from metaphysics to phenomenology, suggests Dolev, helps to unite two contrasting traditions in the philosophy of time: one, the science-inspired analytic tradition; and the other, the phenomenological one. The dualism sometimes insisted on between ‘physical time’ and ‘human time’ is a bogus one. Scientists and phenomenologists are studying the same thing, and the deliverances of one are not therefore insulated from the deliverances of the other.