Metascience (2010) 19:97–99
DOI 10.1007/s11016-010-9337-z

BOOK REVIEW

A coherent collection in defense of realism

Stathis Psillos: Knowing the structure of nature, Palgrave/Macmillan, 2009, xxvii + 230 pp, £ 52.00. HB

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Published online: 11 March 2010

In this collection of essays, Stathis Psillos continues the defense of scientific realism that he began in his *Scientific Realism: How Science Tracks Truth* (Routledge 1999). As in the earlier book, Psillos understands scientific realism as the combination of a robust metaphysical outlook and an attitude of epistemic optimism. The former amounts to the thesis that our efforts to conceptualize the world do not make any non-conceptual (in particular causal) contributions to it; the world, as it is sometimes said, is 'mind-independent'. The epistemic optimism consists in the belief that the aforementioned efforts are by and large successful, and this not only insofar as the observable world is concerned: thanks to modern science, we have also been successful in charting, at least to a considerable extent, the unobservable entities and processes that underlie the observable phenomena.

Much of Psillos' 1999 book was concerned with defending—and clarifying the scope of—a robust epistemic optimism. Already in that book he criticized those who hold that we are only in the position to fathom the *structure* of the unobservable world—be it because of epistemic limitations on our part, or be it on metaphysical grounds, because structure is all there is. His new book contains essays providing further reasons for believing that there is more to the world than structure, and that we can be optimistic that this 'non-structure', too, is within our epistemic reach, at least in principle. Our putative warrant for this optimism is to come from the reliability of scientific method, in particular from what Psillos regards as the cornerstone of that method: Inference to the Best Explanation (IBE). In *Scientific Realism*, he gave a thorough defense of this rule against the backdrop of

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an externalist epistemology. In *Knowing the Structure of Nature*, he offers an essay in which he tries to generalize this defense.

Psillos' concern with metaphysical issues is far more pronounced in the new book than it was in *Scientific Realism*. At various junctures in the former he emphasizes that, on his view, scientific realists need not engage in any deep metaphysical debates. They are committed to the existence of mind-independent facts all right, but what the exact nature of these facts is—whether they are all physical, whether they are all reducible to a small number of basic facts, whether among them are irreducible modal facts, whether some facts are essential, and so on—is a matter that scientific realists can legitimately remain neutral on. Many will agree that the focus of the scientific realism debate should not be on these or other metaphysical questions. But I also suspect that many of those who agree with Psillos about the role that IBE plays in science will think that Psillos slightly overstates the point about metaphysics. For instance, it has been argued—reasonably, I think—that the best explanation of why natural kinds (to whose existence scientific realists are committed, as Psillos acknowledges) exhibit the behavior that they do involves an appeal to essences. If it does, it would be odd—to put it mildly—if one wanted to stay noncommittal on the existence of essences while at the same time endorsing IBE.

Psillos has some particularly interesting new things to say about IBE in the present book. Most importantly, he now argues that a successful defense of the rule does not require a commitment to externalism. Here, he offers a defense of IBE based on a specific type of internalism, inspired by ideas from the late John Pollock and Gilbert Harman. Crucially, according to this brand of internalism, one is warranted in accepting a hypothesis if, roughly, (1) one has a reason to believe the hypothesis that is not undermined by something that one knows, and (2) one does not have independent reason to doubt the hypothesis. Moreover, the notion of reason to believe is spelled out in terms of 'explanatory coherence'. On these assumptions, Psillos argues that IBE has all of the virtues and none of the vices of enumerative induction and hypothetico-deductivism. In particular, it fares much better than the former, and fares as well as the latter, on the issue of 'ampliation'—how far the conclusion of the inference goes beyond the content present in the premises—and fares much better than the latter, but as well as the former, on the issue of epistemic warrant, that is, how much warrant the inference bestows on the conclusion.

I am, however, not altogether convinced by Psillos' new defense of IBE. The main weakness, as I see it, is that the defense crucially hangs on the assumption that explanatory coherence is truth conducive. If it is not truth conducive, after all, then why should the fact that inferring to the best explanation tends to enhance the explanatory coherence of our body of beliefs—as Psillos argues—give us reason to believe that IBE is a reliable rule of inference? At the end of his essay in which he defends IBE, Psillos does admit that more work on the notion of explanatory coherence is required. It is worth noting, however, that since the original publication of that essay (in 2002) a fair amount of work has been done on the notion of coherence. Whereas Harman and Pollock had worked with a purely intuitive notion of coherence, several precise (typically probabilistic) analyses of the notion have been given in recent years. These have allowed researchers to address the question

of the truth conduciveness of coherence in a formally precise fashion. And it is telling that all relevant results have been negative so far. Naturally, Psillos might argue that *explanatory* coherence is not quite captured by the probabilistic analyses of coherence *simpliciter*, and that explanatory coherence may be truth conducive even if coherence in general is not. But at the very least the afore-mentioned negative results concerning the general notion should make one wary of stating any claims that presuppose the truth conduciveness of the more specific one in the absence of an even remotely precise definition of the latter.

In the final essay of the book, Psillos addresses the question of whether IBE can be explicated and legitimated from within a Bayesian framework. The question is a pressing one, at least for IBE aficionados, given that Bayesianism is now generally regarded to be the best confirmation theory available but does not typically assign any explicit role to explanatory factors. Psillos scrutinizes various proposals that have been made for reconciling the rule of IBE with Bayesianism—for instance, that explanatory considerations may help to determine prior probabilities, or that they may determine likelihoods—but finds none of them satisfactory. Towards the end of the essay, he points to the possibility of having IBE and Bayesian reasoning work in tandem, where IBE helps us to select plausible candidates for testing, which are then subsequently evaluated by Bayesian means. But he thinks that this proposal assigns a role to IBE that must strike any friend of IBE as being too limited. In the last sentences of the essay, Psillos suggests that it may rather be Bayesian reasoning that plays a subordinate part in confirmation, as something that we may be invoking when "we are concerned with giving a precise degree of confirmation to the best explanation" (p. 201). However, while interesting perhaps, this suggestion is stated all too briefly here to carry much conviction.

In the introduction to his book, Psillos calls the 1990s the "Renaissance of scientific realism in the philosophy of science" (p. xv). If the flurry of activity surrounding that Renaissance was short-lived—as it was, I submit—then to a large extent this may have been due to the fact that Psillos' own writings on scientific realism to many (myself included) appear to contain at least the near-to-final word on the position. If I had to put the main achievement of Psillos' work in a nutshell, I would say that he has succeeded in showing that, even if it is possible to raise skeptical doubts about scientific realism—as we can do about virtually any position—these doubts would be sophistical and even ludicrous. This is not to declare the scientific realism debate defunct. Psillos shows in the present collection of essays that there are still many details to be discussed and that such discussions can be very worthwhile indeed.