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Cautious realism and middle range ontology

Anjan Chakravartty's book *Scientific Ontology* is centrally about how metaphysics is embrangled with epistemology. Drawing or refusing to draw ontological conclusions inevitably involves risks—the risk of believing what is false, the risk of remaining agnostic and foregoing a chance at true belief, and perhaps even the risk of fretting over would-be beliefs that are ultimately meaningless. Reason alone does not tell us how to weigh these risks. Instead, for each of us, the personal reckoning reflects some particular epistemic stance. Weighing the risks differently (that is, having different epistemic stances) is not a disagreement which can be settled by reasons alone. Thus, our tolerance for different amounts of risk (our different stances) will yield disagreements about ontology which cannot be settled by reason and argument. Some people take the chance of believing in metaphysical posits like electrons or dispositions, but others prefer the safety of agnosticism. Philosophical enquiry can elaborate the risks of these options, but apart from some epistemic stance or another it cannot decide between them.

Simplifying somewhat, Chakravartty identifies three stances among recent philosophies of science (sec 7.2):

- The *deflationary stance* rejects understandings of truth and reference which frame traditional metaphysical debates.
- The *empiricist stance* is cautious and wary of epistemic risk. It rejects any demand that observables be explained in terms of unobservables, and it confines its beliefs to things that we can directly perceive.
- The *metaphysical stance* is bolder. It demands explanations in terms of unobservables, and it sees explanatory power as having evidential force.

Most contributors to debates about scientific realism can be situated within this framework, but on reflection I find it incomplete. It ignores importantly relevant work in recent philosophy of science: on science and values, and on non-fundamental metaphysics.

I want to suggest that these omissions present Chakravartty with a dilemma: The first horn is to construe scientific ontology very narrowly, so that his arguments only apply to fundamental metaphysics. This would diminish the significance of his central claims. The second horn is to broaden scientific ontology. This would make the distinction between epistemic and non-

epistemic value untenable, yielding voluntarism not just for beliefs about scientific ontology but for all beliefs.

I begin by discussing the broader literature in science and values, where arguments akin to Chakravartty's have been much-discussed. Then I talk about my own preferred approach, middle range ontology, which does not fit neatly into any of the three stances Chakravartty discusses. Finally, I use these considerations to pose the dilemma.

Values and risk

The pattern of argument which I summarized in my first paragraph is familiar from literature on values in science, where it is called the argument from inductive or ampliative risk. In response to uncertainty, when evidence is less than utterly compelling, one might draw a conclusion or suspend judgment. When the question is a practical one, the values in play are more than epistemic. In considering whether the treatment for some disease is promising enough to attempt, for example, one must consider what the side effects might be and how serious the disease would be if untreated.

Yet Chakravartty is not concerned with practical questions of how to treat a disease. Instead, as the book says on the cover, his concern is scientific ontology. He frequently refers to differences in *epistemic* values, implicitly distinguishing these from practical values. There is a long tradition of making this distinction, and at times Chakravartty suggests that his voluntarism about metaphysical commitment has no consequences for practical decisions about what to actually do. For example, he writes that "the actual practice of science is so forgiving as to allow coordinated action among scientists despite their possible differences regarding ontological commitment" (p. 6). The suggestion is that we might agree on what to do even where we cannot agree on what to believe.

The tradition of separating epistemic from practical values— although long— is mistaken. This point has been argued by numerous philosophers in recent decades. Although strikingly different arguments are given by Helen Longino (1990) and Heather Douglas (2009), both extend the Jamesian voluntarist tradition in which Chakravartty explicitly situates himself. Yet Chakravartty does not engage either of them and in fact does little to engage with the burgeoning literature on science and values. I have made some small contributions to this literature; e.g. Magnus 2014b.

In his defense, one might note the stark difference between questions of science policy and ones of abstruse metaphysics. It is plausible to think that nothing practical turns on whether physical relations can exist without relata (an example he takes up in chapter 5). Yet this will not do. Chakravartty argues that even belief in mundane, observable things involves metaphysical inference and thus depends on accepting some epistemic stance (e.g., p. 41). If any beliefs have practical consequences, then beliefs about mundane objects in our environment do!

One might finesse this point by appealing to the distinction between acceptance and belief. Ontological commitment is a matter of belief, but it is

acceptance that is relevant for action. A sceptic about tables and chairs might accept them, sitting down for meals in just the way everybody else does.

For myself, I have little patience for a difference in belief that could make no difference for action. If someone makes every practical decision as if they believe, then I am inclined not to trust their merely verbal protestations that they do not really believe. Even if we allow the distinction between belief and acceptance, though, confining ontology to the realm of inert belief separates it from having any consequences. Philosophers continue to debate these matters, and (as Chakravartty says about dispositions) "there is mileage yet in a perennial debate" (p. 126). But one wonders where that mileage leads, if never to any difference in what we would accept.

Middle range ontology

The two cases that Chakravartty gives extended attention are whether dispositions are ultimately real (chapter 4) and whether structure is ontologically basic (chapter 5), suggesting that his primary target is fundamental metaphysics.

This leaves little room for much of the work I have done, what we might call *middle range ontology* (to use the term from Magnus 2015). Start with things which figure in our account of the world and ask how they are realized. We can go beyond the accounts given by scientists and speak at a greater level of depth, without striking a deepest fundamental level or crossing over some binary divide between non-ontological and ontological enquiry.

As an example, consider the homeostatic property cluster (HPC) account of natural kinds. We start with some category which figures in scientific accounts and we identify the causal patterns that hold it together. A species like the common mallard consists of individuals with a complex of typical properties. These properties occur together in particular mallards across space and time because of a whole range of nested causal processes: individual metabolism, development, reproduction from the prior generation, and the whole family tree going back to the origins of mallard-dom. This is middle range ontology because it elaborates how actual kinds are held together in the world without reifying those kinds as fundamental posits like forms or universals. (I say more about my understanding of the HPC account in Magnus 2011, 2012, 2014a, 2015.)

Perhaps Chakravartty would see middle range ontology as the kind of deflationary quietism that remains silent on the traditional ontological questions. There are days when I do "simply lose interest in the traditional approach", when I am "inclined to remain silent about it altogether" (quoting his description of the deflationary stance, pp. 208-209). However, as I suspect Chakravartty would agree, middle range ontology does have metaphysical content. Discovering that some natural kinds are HPCs occurs within a broader account according to which the natural kinds in a specified domain are features of that domain. We can disagree about the fundamental metaphysics, but the common mallard species is as much a part of the world as an individual mallard sitting on the edge of a lake. I call this *equity realism*, because it holds that kinds are just as real as individual things (ch 4, Magnus 2012). This equivalence is a fact about fundamental ontology, even though it leaves room for disagreement or quietism about the details of the

fundamental metaphysics. Even if one were an idealist about the fundamental ontology of ducks, equity realism requires that one say similar things about the individual organisms and the species.

The HPC account identifies causes, but philosophers who accept it might disagree about the fundamental nature of causation. Nevertheless, it provides a constraint on whatever the fundamental story ends up being. The HPC account is compatible with reductive or non-reductive accounts of causation, but it requires that there are some facts of the matter. As such, it rules out a causal nihilism according to which there is no ultimate difference between true and false causal claims. The HPC account constrains fundamental ontology, and so it does not 'remain silent about it altogether.' Middle range ontology and equity realism, although modest, do not reflect the deflationary stance.

Middle range ontology does not comfortably fall on either side of the opposition between the empiricist and metaphysical stances, either. That opposition, it seems to me, is carried over from the way that debates about realism and antirealism have been framed since van Fraassen's *The Scientific Image*. Devotees of the two different stances draw all of the same conclusions about observable things and make all of the same practical decisions, differing only in the beliefs which they form along the way. At least two things must obtain in order for this to be tenable: First, accepting a claim for all practical purposes must be different than believing it. Second, there must not be any inference forms which the empiricist respects which would lead to conclusions about unobservables.

I discussed my scepticism about the first, above.

Regarding the second: The boundary between the observable and unobservable is vague at best. Various instruments which can be used to detect unobservable things can be used to detect barely-observable things along this vague boundary, and the continuity of the instrument itself justifies belief in the unobservable things. For example, I can use an optical microscope to look at small details which I can barely make out with my naked eye, details which my eagle-eyed friends can discern unaided but which I cannot, and details which neither they nor I could discern without the microscope. Accepting the latter observations even though they reveal unobservable things relies only on a simple projective inference and not on explanatory considerations.

Philip Kitcher calls this the Galilean Strategy (2001; see also Magnus 2003), but it is a standard realist petard. Appeal to it can provide justification for believing in things far removed from the observable. Once we trust optical microscopes, we can use their limits to justify trust in other, more powerful instruments. There are objects which can just barely be discerned by optical microscopes but can be clearly resolved with electron microscopes, so we may apply the strategy again to justify trust in electron microscopes.

The strategy generalizes, although there will be particular complications with each different instrument and inference. It will not get us immediately to the posits furthest removed from observation. There may be some posits which cannot be secured by this strategy at all. Yet it does justify a cautious kind of realism. It reaches beyond what can be observed with our unaided senses, and there is no *a priori* constraint on how much it could grasp. Unlike the metaphysical

stance, however, it neither relies on explanationism nor promises insight into fundamental metaphysics.

The cautious realism underwritten by the Galilean Strategy fits comfortably with the approach to metaphysics characterized by middle range ontology. As I have explained, however, this cautious realism fits neatly into neither the deflationary stance, nor the empiricist stance, nor the metaphysical stance.

A dilemma

I have raised two concerns about Chakravartty's project: that it does not address how these issues have been handled in the literature on values and science, and that it does not make space for the kind of scientific ontology that I do. I worry that both of these concerns are not so much about Chakravartty as they are about me— Why has he not talked more about the problems that interest me?

Even so, I think that the two worries pose a dilemma. Either some answer must be given as to why the literature on values and science is irrelevant and why middle range ontology is outside the scope of the account, or the lessons about values and science must be taken to heart and some place must be found in the framework for middle range ontology. To put it simply: The scope of the account must either be narrowed or broadened.

Narrowing the scope of the account to just fundamental metaphysics would immunize it against both of the worries I raised above. If fundamental metaphysics has no practical consequences, then no practical values could possibly be at issue. And the framework would simply not be about philosophies of science concerned with non-fundamental, middle range issues. The cost of embracing this horn of the dilemma would be to drain the account of much of its interest. There is more to the world than just its fundamental ontology.

Broadening the account to cover more modest ontology, though, would risk extending it to cover everything. Matters of middle range ontology might well have practical consequences. The risks of believing or not believing would not be merely epistemic. Adopting some epistemic stance or other would then not just be a decision about how to apportion one's beliefs but also a decision about what to do. It would reflect practical, ethical, and political values. Scientific ontology would depend not just on our epistemic stances, narrowly construed, but on our stances toward a wide range of practical risks.

Chakravartty argues that epistemic stances are not ultimately subject to rational criticism, and I suppose the same would hold for our practical, ethical, and political stances. As such, in the broadened account, the voluntarist conclusion about scientific ontology is just an instance of voluntarism about everything. On this horn of the dilemma, it would be a modest understatement when Chakravartty writes, "There is no objective distinction between theorizing and speculating in the context of scientific ontology" (p. 89). There would be no objective distinction between theorizing and speculating *tout court*. Forming any beliefs would depend in part on stances that are beyond rational criticism, and beliefs about scientific ontology would just be a special case.

Note that this dilemma is not meant to serve as a *reductio ad absurdum* of Chakravartty's project. There are philosophers who would happily embrace the first horn, and others who would happily embrace the second. I am tempted to say something that might just be a joke: Choosing a horn of the dilemma depends on your epistemic stance. It is a matter between you and your conscience, beyond rational criticism.

Regardless, the account looks very different on one horn than on the other.

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