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REVIEW

***SCIENTIFIC ONTOLOGY: INTEGRATING NATURALIZED METAPHYSICS AND VOLUNTARIST EPISTEMOLOGY*, ANJAN CHAKRAVARTTY (2017)**

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Anjan Chakravartty has become one of the most respected voices in the discussion around whether we should be realists about the ontology, semantics and epistemology suggested by our best science. In his first book (2007), he took inspiration from both van Fraassen's (1980) anti-realist constructive empiricism and from the twin realist pillars: entity realism and structural realism. This presented an intermediary position between the three, in the form of a 'selective scepticism' for 'sophisticated' realists, aptly labelled 'semirealism'. Towards the end of the text, Chakravartty 'reach[ed] out […] from the perspective of realism, to build a bridge of sorts to other perspectives' (2007: 230). This pacific middle-way agenda is continued in his recent second book *Scientific Ontology: Integrating Naturalized Metaphysics and Voluntarist Epistemology* (Chakravartty 2017). This time he takes on the innovative project of merging the realist's methodological center – naturalized metaphysics, with one of contemporary anti-realism's core instruments – voluntarist epistemology.

Chakravartty argues convincingly in part one of the book that science and philosophy are intertwined in the context of forming ontological commitments. Given the underdetermination of theory by data, extra-empirical metaphysical inference is inevitable when interpreting scientific ontology. Different agents, though, make different ontological commitments, i.e. adopt different stances, as per their different presuppositional epistemic commitments. These presuppositions are the attitudes and values that fine-tune stance-choice along a continuum of magnitudes of metaphysical inference. The door is now ajar to pluralism about interpretations of scientific ontology via van Fraassian epistemic stances (van Fraassen 2002). Chakravartty offers the apt slogan: 'no

stance in, no ontology out' (2017: 65). Metaphysical inferences should, though, be continuous with empirical inquiry, thereby presenting a naturalized metaphysics of the sort realists can be proud of.

Chakravartty divides stances broadly into the *metaphysical stance* and the *empiricist stance*.[1] The metaphysical stance – including entity realism and structural realism – involves naturalized metaphysics, while the empiricist stance – dominated by van Fraassen's constructive empiricism – entails voluntarist epistemology. The distance along the continuum of magnitudes of metaphysical inference between a metaphysical inference and a foundation of empirical output is determined by judgements of (1) *epistemic risk* (how risky is it to assign a high degree of probability to belief in my ontological claim?). Varying inversely proportional to epistemic risk, in this triple-levered schema, are (2) *empirical vulnerability* (how vulnerable is my ontological claim to empirical testing?) and the contentious heuristic (3) *explanatory power* (how well does my claim explain the data of experience?). Although Chakravartty recognizes that the virtue of explanatory power is 'indefeasibly in the eye of the beholder' (92), he values it nonetheless for its capacity to 'serve as a massive counterweight to a lack of empirical vulnerability' (88). Explanatory power's apparent ability to unify theories means it can press against underdetermination in a way that empirical vulnerability cannot, thereby lowering epistemic risk and increasing our doxastic confidence in a pertinent claim about the ontology of the world.

So, epistemic agents – adopting different stances, and utilizing Chakravartty's three heuristics, just mentioned – evaluate possible domains of enquiry along the continuum of magnitudes of metaphysical inference. They make judgements as to where to draw a line between, 'on the one side, domains of ontological theorizing that are viewed as amenable to belief [versus disbelief], and on the other side, domains that are viewed as amenable only to suspension of belief instead' (214). Chakravartty is thereby able to advance his version of pluralism, while avoiding relativism – in which '*contradictory* beliefs [in *P* and ~*P*] are licensed as rational even in the light of all the same evidence' (230, original emphasis). Because epistemic commitment applies to stances in the first instance and only secondarily to belief:

> someone adopting one stance believes *P*, someone adopting another stance may hold that *neither P nor ~P* are propositions that she can believe […] there is no license to make contradictory ontological claims, only different decisions concerning which magnitudes of metaphysical inference are admitted as generating belief in the first place.
>
> (230–31, original emphasis)

Chakravartty concludes part one with a 'profound form of pluralism' (190), involving, not just a plurality of stances, but a plurality of ontologies. Contrasting descriptions of the world are not incompatible descriptions of the same thing, they are '*compatible* descriptions of *different* entities – compatible precisely because they describe different things' (190, original emphasis).

Part two involves a detailed demonstration of the *power* of both explanatory power and underdetermination. Chakravartty illustrates this through an exploration of two case studies. First is the abductive utility of his preferred ontological primitive: dispositional properties as causal powers.[2] He argues eloquently that entity realism and structural realism can both be accommodated by dispositionalism. Dispositions 'underwrite' both empirically manipulated

1. Chakravartty also mentions a third *deflationary stance*, but puts it aside to focus on the other two, which he considers more relevant to scientific ontology.

2. Chakravartty argues for dispositional realism at length in his (2007) book. Although he favours a dispositional ontology, Chakravartty, of course, has to allow that dispositionalism is only one viable conclusion to investigations into scientific ontology. Consistent with his pluralism, dispositionalism must be thought of as an internally coherent preference or stance: one among many.

entities and the relational *structures* between them; *structures* are 'encoded' in the dispositional properties of *entities*. Dispositional realism exhausts *explanation* of the natures of things, says Chakravartty, 'no further insight in terms of underlying categorical natures [is] available' (126).

The second case study involves Chakravartty's sceptical assessment of various posits about the ontology of physics made from within structural realism: in particular to do with causal (or physical) 'oomph'. Structural realists attempt to attribute causal 'oomph' to basic structural relations, rather than to the particles of fundamental physics (as entity realism does). This inversion, however, cannot elude the destabilizing effects of underdetermination, thereby rendering structural realism's claims inconclusive. In fact, submits Chakravartty, any realist theory that makes assertive claims about the 'fine-grained ontology' of the world faces the same inevitable irresolution. Different ontologists will come to different – yet rational and possibly useful – conclusions, and there is no sensible 'deeper' algorithm to appeal to in these arguments (151). This bottomless impasse presents an epistemic stalemate. The structural realist says there is structure all the way down, but instead it is a case of underdetermination all the way down.

van Fraassen's voluntarist epistemology (2002) and Pyrrho of Elis' scepticism (in Sextus Empiricus 1933) are introduced in part three of the book. We have seen how empirical, methodological, institutional and cognitive features underdetermine ontological theorizing. Stance commitment is, therefore, 'an expression of self' (Chakravartty 2017: 242), 'one is at liberty to choose' (221), declares Chakravartty. He is motivated by James' (1897) assertion that the path one walks when making epistemic choices is largely determined by one's 'temperament'. As such, the will – viz. free voluntary choice informed by personal values – permeates our metaphysical methodology in the form of epistemic volition. Why do agents have the specific temperaments, with associated values, that they do? Chakravartty shrugs 'there is [not] much of anything one can say' (242). This, though, does not imply that anything goes. Beliefs, generated by internally coherent stances, are loosely constrained by two criteria: (1) an appropriate theory of van Fraassian permissive rationality and (2) naturalized grounding in empirical output. Although stances generate beliefs according to these two criteria, upon sceptical analysis, underdetermination again shakes our foundations; 'stances underdetermine the beliefs they facilitate' (226). As such, epistemic and (*mutatis mutandis*) doxastic voluntarism is 'actual[…] inevitable and entirely reasonable given our epistemic condition' (229).[3]

Chakravartty has ostensibly demonstrated, in Pyrrhonian fashion, that no rational stance has epistemic superiority over another regarding where to draw the line delineating belief from agnosticism. We should suspend belief in any stance-transcendent truth, given that internally coherent stances are '*qua* rationality, the only relevant measure, "equally strong"' (243, original emphasis). This should provoke an attitude of tolerance towards apparently rival views. If we follow Chakravartty, disputes over stance choice – when interpreting scientific ontology – should involve modest, liberal queries into the coherence and values of rival stances, not fruitless, hard-nosed squabbles over the nature of ontology *simpliciter*. We cannot do otherwise. Our conclusion should be an attitude of '*ataraxia* – peace of mind, calmness, or freedom from worry in the face of previously pressing questions' (244–45, original emphasis).

In summary, Chakravartty's functional schema for constructing scientific ontologies looks something like this: at the 'subjective' end of some stance,

3. Chakravartty's stresses that voluntarism applies to stances in the first instance and only derivatively to 'downstream' beliefs (2017: 219). Stances generate knowledge, which – in turn – determine belief.

within a plurality of stances, is the variable and creative – even normative – input, facilitated by *voluntarist epistemology*. Serving as an 'objective' counterbalance is the anchor of *naturalized metaphysics*, loosely grounding stances in empirical inquiry. Agents evaluate this schema by considerations of epistemic risk, empirical vulnerability and explanatory power. They make judgements as to where to draw a line between belief and agnosticism along a continuum of magnitudes of metaphysical inference. These judgements are underdetermined though, thereby introducing epistemic/doxastic choice, and ultimately *ataraxic* quietism. If we embrace Chakravartty's pluralism about ontology, then these two major themes – voluntarist epistemology and naturalized metaphysics – can be cooperative partners. They should be the two central working heuristics in a dual-core collaborative method: an instigative project – both institutionally transformative and personally inspiring (251–52).

At the end of the book Chakravartty submits that his project is, in some sense, an attempt to further social and political transformation in the sciences (249–50): to build bridges of communication and cooperation. He can be thought of as audaciously pushing transformative norms into the descriptive-explanatory philosophizing that happens around the ontology of the hard sciences. Chakravartty's book presents a detailed, yet clear, argument for a permissive pluralism midway between scientific realism and anti-realism. There is much to commend in this bold, enticing project, and I will discuss what I consider to be the various strengths of the argument towards the end of this review. For now, though, I will highlight two potentially problematic aspects to the book. First is Chakravartty's joint promotion of both Pyrrhonism and scientific realism. Second will be the distinction, or lack thereof, between Chakravarttian pluralism and epistemic relativism.

My first concern is a methodological one. The fulcrum of Chakravartty's book is his conclusion that the appropriate attitude towards judgements about the superiority of one ontological stance over another is tranquil suspension of belief. This is *ataraxia*, arrived at by the Pyrrhonian sceptic's 'ability to align […] arguments on either side of a proposition, for and against, so as to appreciate their "equal strength"' (242). The alleged equal strength of the two major stances – the metaphysical and the empirical – is, strangely, not formally explicated in this way though. Chakravartty does not attempt the laboured task of demonstrating the overall alignment of the core propositions of each stance. He does not take 'the evidence and arguments before him and argu[e] to a standstill' (243), in courageous Pyrrhonian fashion. Instead, he utilizes the negative tactic of repeatedly invoking uncertainty due to underdetermination. I agree with Magnus, who suggests that even the answer to the 'problem of other minds […] is arguably underdetermined' (2005: 30). He predicts a slippery-slope to solipsism, or perhaps sociopathy, if we consistently adopt agnosticism in the face of underdetermination. A probabilistic epistemology/doxastology seems the obvious alternative.

Pyrrhonism is also open to the charge that its method is fundamentally ad hoc. The Pyrrhonian, it seems, approaches any debate with the prior motivation that she will sustain agnosticism. Lammenranta notices that Pyrrhonism requires that one selectively 'attend only to arguments that are equally strong on both sides of the issue, and manage to forget arguments that do not balance in this way' (2008: 15). He suggests that we should instead 'take all arguments on both sides of the issue into account, and these arguments typically do not balance' (15). Pyrrhonism appears to be a tactic of sceptical manipulation, rather than an internally consistent stance for generating knowledge.

Its calculated debunking agenda seems at odds with the fair-minded scientific spirit of realism – the very *ism* Chakravartty claims is the tent-pole of his world-view.

The second issue for discussion is whether, despite his insistence otherwise, Chakravartty's laissez faire pluralism may perhaps just be relativism in disguise. He has sanctioned relativism in the past (see Chakravartty 2011 and 2015) but is trying to avoid its implications here. I assume this is to make his conciliatory project more appealing to realists, who generally balk at any intrusion of relativism into their discourse. In 2011 Chakravartty uses the terms 'pluralism' and 'relativism' synonymously, claiming that grappling with 'the metaphysical dimension of realism opens the door to relativism or pluralism […] Not all forms of relativism or pluralism are inimical to realism […] there can be no tenable scientific realism without it' (2011: 178). In 2017 though, as we have seen, he promotes pluralism and resists relativism.

Also, the more one reads Chakravartty's writings, the more it seems that a norm of social tolerance in science and philosophy is his overarching intellectual motivation. His soft naturalism and liberal voluntarism will therefore, at times, apparently encourage 'ethics first'. He, for example, explicitly endorses what he calls 'transformative philosophical projects' in the sciences. These projects' 'ultimate aim is to […] promote or enable some form of human flourishing' (Chakravartty 2015: 169). Chakravartty cultivates a view that evidently includes claims about scientific ontology periodically answering to ethics (and thereby presumably to politics).[4] If this radical inversion of standard scientific principles can qualify as an aspect of *realism*, then he has stretched the criteria of the position beyond the bounds of rationality (even the permissive kind). Upon inspection Chakravartty's 'Pyrrhonian pluralism' appears, for all intents and purposes, indistinguishable from anything-goes. Both Pyrrhonism and relativism conclude with a plurality of equitable indeterminacies or uncertainties. This synchrony offers an apparently oxymoronic position Worrall dubs 'sceptical relativism' (see his 1989 work). Chakravartty's elastic criteria of rationality and free-to-choose voluntarism present a view that still invites all the well-known problems of relativism.

There is, however, much to value in Chakravartty's book. Clearly a great deal of thought and planning has gone into the superbly articulated text. The book's introductory argument, that metaphysics and science are intertwined, carries much weight, and may give even die-hard positivists pause for thought. Worth regard, as well, is Chakravartty's attempt to deal with the problem of underdetermination. Although I have suggested he does so in a way that is somewhat unsatisfying, he deserves credit for his lengthy and thoughtful grappling with this perennial challenge to realism. Chakravartty's general distaste for distinctions also warrants commendation. The notion of *degrees* of inference, knowledge and belief is persuasive. He convincingly stresses the role of continuums and magnitudes, rather than binary dichotomies between, for example, truth and falsity.

A last topic worth mention, which Chakravartty touches on only briefly in this book, is what one might call 'Chakravartty's dilemma'. Theorists inquiring into fundamental ontology face an unsavoury choice between 'ontologies that require the acceptance of [a] contentious [ontological] primitive […] on the one hand, and scepticism on the other' (Chakravartty 2017: 137). Chakravartty attempts to dissolve the problem 'by means of a principled combination of belief and less committal attitudes toward scientific ontology in any given

4. Cf. Chakravartty's (2015: 179–80), in which he tentatively encourages this opportunity.

domain' (137). This apparent solution is, as indicated above, indistinguishable from relativism to me, but the dilemma presents a thought-provoking puzzle for some possible future project.

Ultimately, whether one finds the book convincing will depend on whether one buys into certain core motifs. Chakravartty stresses the salience of factors such as explanatory power, underdetermination, suspension of belief and tolerance. His justification is – to my mind – underdeveloped given the central supporting role these devices play and the radical conclusions he derives there from. If, however, one is inclined towards the same intuitions as Chakravartty about the degree of argumentative and empirical support certain ideas require, then the narrative should be subsequently persuasive. Nonetheless, it offers truly engaging reading and makes a novel, meaningful contribution to the broader debate. I highly recommend Chakravartty's book to anyone who cares about the lively discourse in, and around, Quine's big question: '[w]hat is there?' (1961: 1).

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