

Anjan Chakravarty

A Metaphysics for Scientific Realism.

Knowing the Unobservable.

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Neopositivist prejudices having progressively faded away, philosophy of science has become more and more open to contributions coming from metaphysics. Already in the 1980s, with the idea of 'experimental metaphysics', the latter was granted a certain degree of autonomy and significance, provided however that it was read off directly from our best physics. Nowadays, the idea is becoming gradually more widespread that a parallel study of metaphysics and science as two equally respectable disciplines is to be auspicated. This hints at the view that, although tightly interrelated, metaphysics and science are not in a relation of dependence (in either direction), and that, in fact, by starting from the assumption that they can integrate each other, one can seek and achieve the most progress toward knowledge of reality.

Chakravarty's starting point is exactly that philosophers of science in general must deal with metaphysics (if only to provide arguments against the need to study it), and scientific realists in particular must offer a metaphysical underpinning to their views.

The book reworks and completes material that has already appeared in a number of papers, the result being a nice self-contained monograph. In Chapter 1, Chakravarty offers a very useful conceptual taxonomy of positions that philosophers can take (and have taken) regarding scientific theories and the infamous observable/unobservable distinction. He also argues convincingly in favor of the metaphysical stance, while also acknowledging that, being a stance, it can consistently be set aside by empiricists and in general by those skeptical about abductive explanations.

Chapter 2 focuses on the traditional troubles for scientific realism, e.g., skepticism concerning induction and the underdetermination of theories by data. Against these, realists normally apply restrictive strategies aimed at showing that they can commit themselves to certain parts of theories only, and so avoid the alleged problems. The most popular of these forms of 'selective scepticism', as Chakravarty calls it, are entity realism, which prescribes that we be realist only about those unobservable entities with which we can interact causally, and structural realism, by which we can be realists only about whatever aspects of reality are described by the mathematical part of our scientific theories and preserved across theory change — at least as a limiting case. Chakravarty convincingly argues that neither of these can satisfy the realist's needs (although, in the case of structural realism, he seems unwarrantedly to generalize to all structural realists the idea that one should be realist only about higher-order structures that describe the properties of the relations holding between things (38). In fact, this seems not only open to discussion, but one of the things most in need of clarification in the debate

about structural realism. Chakravarty then goes on to define his own position, semirealism. Semirealism is realism restricted to causal structures, that is, to structures consisting of causal relations between things and to these relata as 'bearers' for the intrinsic natures giving rise to such relations. As such, it represents an astute mixture of elements from both entity and structural realism.

Chapter 3 expands on this, arguing for the mutual interrelation between causal relations and objects as the relata that bear the dispositions that determine such relations. Simple but compelling arguments are offered against the most radical and revisionist form of structural realism, according to which structure is all that we can be realist about it is all there is to reality (this is known as 'ontic structural realism'). In particular, Chakravarty correctly puts into doubt the move from the (alleged) underdetermination between individuality and non-individuality at the level of the ontology of the micro-world as it is described by quantum mechanics to ontic structural realism.

Chakravarty interestingly contends that the natures of objects are best understood in terms of real — 'occurrent' — but dispositional properties. More specifically, according to Chakravarty a distinction can be drawn between genuinely causal 'detection' properties, about which we can be realist, and 'auxiliary' properties, also part of the description of things offered by the theory but in fact dispensable.

And here is where the need for metaphysics kicks in. Chapter 4 provides a sophisticated defense of a realist conception of causation. Against some traditional objections, Chakravarty delineates a view according to which complex causal processes exist as continuous alterations of properties in which dispositions become manifest and more dispositions are created (107-10). One might wonder whether the problem with the allegedly necessary connection between an event as 'cause' and another event as 'effect' truly disappears with this move, but one should bear in mind that Chakravarty is offering 'a' metaphysics for scientific realism here, and certainly not a definitive argument for causal realism. In Chapter 5, he endorses the so-called 'dispositional identity thesis', according to which a causal property is entirely identified on the basis of the dispositions it confers, and thus of the behaviors it determines on its bearer, although a disposition is not identical with its manifestations. If dispositions are known only through their manifestations, though, it seems that the identity of causal properties is to be reconstructed post hoc, grouping together the alleged by identical causes of the same manifestations. Maybe Chakravarty needs to say more about this.

In Chapter 6, the notion of kind is analyzed. A form of essentialism on certain natural kinds is endorsed together with a concept of a kind as a cluster of properties — none of which is necessary for belonging to the kind — that Chakravarty convincingly argues for on the basis of biology.

The last two chapters of the book deal with the way in which 'theory meets world', that is, with the notions of representation and truth. Chapter 7 presents compelling arguments to the effect that realists cannot avoid the challenges associated with the interpretation of language, for any repre-

sentation of the world is either linguistic or to be interpreted via language. Likewise, the idea that there is a correspondence between representations and the world is presented as necessary. In Chapter 8, Chakravarty goes on to examine and dismiss the most popular approaches to verisimilitude and truthlikeness. He embraces a Goodmanian viewpoint, according to which in science as in art the core of representation is denotation (226). Chakravarty claims that very often representations contribute to a true representation of reality only in terms of existential claims. Otherwise, representations can be more or less approximately true by describing more or less closely the concrete structures that (at least according to the semirealist) constitute reality. Chakravarty leaves the definition of such closeness open, saying that 'degrees of resemblances are defined as appropriate in each case' (229) and that improvement in representation has to do with how many relevant properties and relations one describes and how accurately one does so (229-30). He closes by emphasizing the degree of pragmatism, and so of context-relativity of truth, that realists must acknowledge in view of the utility-oriented nature of contemporary science. This would perhaps require a longer argument, but certainly makes sense in view of the inevitably imprecise nature of our description of things.

Chakravarty's book certainly represents a welcome contribution to the debate on scientific realism in particular, and to the philosophy of science more generally. The specific suggestions made are almost invariably stimulating, well formulated and convincing, although every now and then they fall short of constituting an inviolable fortress for the realistically-inclined philosopher, and are best regarded as indications of possible views and avenues of research — something that, on the other hand, Chakravarty honestly declares from the outset of his book.

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John B. Cobb Jr., ed.
Back to Darwin: A Richer Account of Evolution.
Grand Rapids, MI: William B. Eerdmans
Publishing Company 2008.
Pp. 434.
US\$36.00 (paper ISBN-13: 978-0-8028-4837-6).

Often fascinating, often frustrating, this is a hefty — and unfortunately un-indexed — anthology on evolution and religion, distinguished by its emphasis on process thought, the philosophical-cum-theological approach to metaphysics based on the writings of Whitehead. As Cobb, himself a pioneer of process theology, explains, the purpose of the book (and of the conference on which it was based) is 'to introduce a Whiteheadian voice into the present discussion of evolution and religion' and to indicate 'the way in which a theistic evolutionary theory can be coherently developed from a Whiteheadian point of view' (17-18). Not all of the contributors are invested, or even particularly interested, in process thought, but the volume is editorially shaped in such a way as to present 'one long argument' (to borrow Darwin's phrase) for the importance of process thought for understanding evolution, scientifically as well as theologically.

Cobb challenges what he takes to be three dubious claims: that contemporary evolutionary theory is scientifically adequate, that the metaphysics presupposed in contemporary scientific practice is philosophically adequate, and that both of these are theologically adequate for 'a revised formulation of theology' (311) — that is, a formulation along the Whiteheadian lines he favors. In so doing, he is seeking to integrate science and theology in a way that may require revisions not only to theology but also to science; he is thus rejecting, in the familiar typology offered by Ian Barbour, the alternative positions on which science and theology are regarded as in conflict, as independent, and as in dialogue. On none of these points, too, are all the contributors in agreement with Cobb, as he acknowledges, but it is fair to judge the volume's success in terms of the success of his ambitious project.

In reacting against contemporary evolutionary theory, Cobb's argument finds a foil in what he calls neo-Darwinism, here represented in person by Francisco Ayala. A student of Dobzhansky and a formidable scientist in his own right, Ayala is also a former Dominican priest with a doctoral degree in theology; he favors the independence position in Barbour's typology. His main contribution to this collection is 'From Paley to Darwin: Design to Natural Selection', but he also furnishes four subsidiary essays on various subjects. In all, about a generous seventh of the book is Ayala's, although anyone wanting to understand his views will probably be better served by reading his *Darwin's Gift to Science and Religion* (2007). He devotes a few salient pages to the term 'neo-Darwinism', observing that it 'has little currency among evolutionary biologists' and seems to be 'mostly confined to the writings of philosophers and theologians' (53).

As if to prove him right, neo-Darwinism turns out to be the philosophical and theological bogey of the volume. David Ray Griffin, for example, identi-