

Alexander Bird, Brian Ellis, and Howard Sankey (eds.)

Properties, Powers and Structures: Issues in the Metaphysics of Realism.

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In this new volume, the fifth one in the series of Routledge Studies in Metaphysics, you can find an introduction and fourteen new essays, divided into six parts. It is concerned with much-discussed issues in contemporary metaphysics, like the nature of properties (I and V), the connection between causation and dispositional properties (IV), the ontology of mathematical entities (III), the metaphysical status of natural kinds (VI), and the structure of reality (II).

The editors, Alexander Bird, Brian Ellis and Howard Sankey, in their compendious but very informative introductory essay, explain what (metaphysical and scientific) realism is, how realism has become dominant in metaphysics, and in what sense metaphysics is connected to the sciences. Below I present some interesting points without entering into every detail.

If you are a realist, you will grant the following two claims. (1) The natural world around us, including its (fundamental) parts, has a mind- and language-independent existence in the sense that its nature does not depend on our ways of thinking and talking about it. (2) Despite its independence of us, the world is within our reach: the best way to discover the nature of our world is given by natural sciences which not just aim to describe truly how the world really is, but do so, at least for the most part, successfully. Without being exhaustive, (1) expresses the metaphysical realist attitude to reality, while (2) expresses the scientific realist attitude to the scientific theories we use to reveal the nature of this world.

Now consider a particular realist approach given by one of the greatest advocates of realism, David Lewis. Inspired by David Armstrong's conception of properties as universals, he makes a distinction between *sparse* and *abundant* properties. Abundant properties are just the semantic values of meaningful predicates, but there is an elite minority of properties consisting of sparse properties, or, as Lewis also calls them, (perfectly) *natural* properties discovered by empirical sciences, especially physics. Although Lewis is a full-blooded realist in the sense of (1) and (2), he is a *nominalist* and a *reductionist*. As a nominalist, he does not believe in the existence of universals but instead identifies properties with sets; so the natural/non-natural distinction is objective but *primitive*. As a reductionist, he maintains all else supervenes on the distribution of perfectly natural properties and relations, i.e. the intrinsic properties of point-sized objects (or space-time points) and their spatiotemporal relations. According to Lewis's Humean metaphysics, the world is fundamentally *amodal*; there are no necessary connections between distinct objects, so that natural laws and causal relations are mere regularities and are metaphysically contingently true. Moreover, there are no natural dispositional properties; the powerful features of objects are reduced to their intrinsic categorical properties. (For the most recent defense and improvement of this Lewisian realist stance, see Theodore Sider, *Writing the Book of the World*, Oxford UP 2011).

Many contemporary metaphysicians, even if they commit to the metaphysical importance of the distinction between natural and non-natural properties, do not agree with the Lewisian realist approach in many respects. Many contemporary realists, including the authors of this volume, are *anti-nominalists* and more or less *anti-Humeans*. As anti-nominalists they endorse the existence of

universals or tropes; properties are not just the sets of their instances. As anti-Humeans they maintain that world has genuine modal characteristics: laws governing the natural world are not merely regularities but metaphysical necessitations existing as genuine parts of our world; moreover, at least some natural properties are *irreducibly* and *essentially* dispositional or powerful.

Below I will present the main topics and issues that the authors of this collection show great concern about, and advert briefly the solutions they give.

The nature and (causal) role of natural properties

Are (perfectly) natural properties categorical or dispositional? How can we explain the causal effectiveness or relevancy of this kind of properties? How can we give an account of the causal basis of dispositions? In the papers of part I, IV and V we can find answers to these questions.

Categorical properties are those whose identities depend on what they are and not on how they dispose their bearers to behave in different circumstances; they are sometimes called *quiddities*, since their identities are independent of their causal roles. The well-known candidates for such properties, among others, are space-time positions, shapes and sizes. By contrast, the identities of *dispositional* properties, like conductivity, elasticity or fragility, depend on what they make their bearers to do. The nature of properties entails what kind of role they play in causal connections between the entities having them. If properties are irreducibly dispositional they play active roles; if they are categorical and have no other nature they have causal relevance but their roles are passive.

This book starts with a symposium on properties. The three contributors to this, David Armstrong, Alexander Bird and Brian Ellis, present three different conceptions of natural properties. These papers contain relatively few novelties, since their authors primarily attempt to sum up the theoretical advantages and disadvantages of positions they have already worked out and defended in detail elsewhere. But we can find concise and very clear formulations of their main claims, as well as a good sense of where they agree and where they disagree with each other. All of them accept the existence of universals and lay special emphasis on natural laws. However, Armstrong is a full-blooded categoricalist, i.e. he argues that all dispositional properties have a categorical basis. Contrary to him, Bird advocates *pan-dispositionalism*, maintaining that all natural properties are irreducibly dispositional or powerful. And Ellis has a dualistic conception: he argues that some natural properties, namely space-time positions or locations, are not and cannot be reduced to causal powers; these properties are categorical. However, this does not mean that they have no importance for the causal connections between their bearers; locations and distances of causal relata can have causal roles without being reducible to causal powers.

In part V (“Pan-dispositionalism”), we find three papers about the tenability of pan-dispositionalism. Sharon R. Ford further develops Ellis’s dualist conception, and argues that the categorical-dispositional distinction is not “ontologically robust” but merely instrumentally useful, “at object-level”, and every property, either categorical or dispositional, supervenes upon the fundamental base described as *purely powerful*. In her essay, Barbara Vetter looks at Bird’s dispositional essentialist position critically. She denies the superior explanatory power of dispositional essentialism over categoricalism and gives an argument against the modal assumption built into Bird’s dispositionalism, namely, that “if dispositions are to be analysed in any way, it will have to be in terms of counterfactual conditional” (214). Matthew Tugby presents a difficulty for

pan-dispositionalists and then offers a solution to it. It seems that there are three undeniable facts about dispositionality: (i) dispositions are directed toward their manifestations; (ii) some dispositions are intrinsic; and (iii) there are unmanifested dispositions. Pan-dispositionalists should admit all these facts about dispositional properties, but it seems that they cannot do so. If directedness is an essential feature of dispositions and we specify dispositions as purely relational entities, then there is a tension between (i) and (ii) or (iii), since the latter two claims characterize dispositions as not essentially relational entities. According to Tugby, if dispositions are universals, and not tropes as many other dispositionalists think, this tension disappears.

Categoricalists engage with the thesis that any dispositional or powerful property requires a reduction and a causal basis consisting of one or more categorical properties. Of course dispositionalists deny this, but they must take account of these bases. In part IV (“Dispositions and Causal Powers”) the authors try to give such an account. Max Kistler draws a distinction between powerful properties and dispositions; the latter are always based causally upon the former. Kistler’s examples are multi-track dispositions which can be reduced to and explained by single powerful properties in a unitary and simple way. According to William A. Bauer, those who believe in the existence of pure dispositions should accept that they are *self-grounded* entities. Even if it sounds weird, he argues that there is no better way to grant the continuous existence of unmanifested dispositions. Stephen Mumford and Rani Lill Anjum propose a new model of causation for dispositionalists: powers have directions and intensity which can be represented by vectors and their length. They demonstrate some advantages of this causal model over Humean ones, especially the counterfactual conception.

When metaphysics meets science

It is widely agreed among contemporary metaphysicians that scientific achievements should have an impact on our general ontology. Bird’s words could be a credo of contemporary realists: “[O]ur metaphysics must be naturalistic to the extent that its purpose is to contribute to a coherent overall picture of the world, a major component of which is supplied by natural science. While metaphysics should not be enslaved to science, it is nonetheless true that harmony between a metaphysical view and the deliverances of science is a point in favor of that view” (41).

Realism about mathematics is a good example. According to Quine, we have to commit ontologically to mathematical entities because mathematics is *indispensable* for true physical theories and so in physics we often quantify over mathematical entities. However, in contemporary metaphysics *nominalists* do not just deny the existence of universals but also defend anti-realism about abstract (and among them mathematical) entities, like numbers and geometrical figures. The following argument presents the problem for realists about mathematics: mathematical entities are causally inert, so they do not play any role in causal explanations; but all explanations in the sciences are causal explanations; therefore mathematical entities cannot play any explanatory role. Thus, a nominalist concludes, mathematics is metaphysically dispensable.

There seem to be at least two possible ways to defending *anti-nominalism* in the philosophy of mathematics. One is to argue that there are *non-causal* scientific explanations in which we have to appeal to abstract entities. The other is to offer an alternative to Quine’s criterion of ontological commitment. In the first essay of part III (“Realism in Mathematics”) Stathis Psillos chooses the first option. He argues that not just causally efficacious entities can be part of reality. Since scientific

theories imply the existence of a host of abstract entities, like ideal gases, frictionless planes, etc., (“non-mathematical abstract entities”, as Psillos called them) which do not differ essentially from mathematical entities, we have no good reasons to believe that our scientific theories can avoid ontological commitment to abstract entities and have purely nominalistic contents. In the other essay of this part, Anne Newstead and James Franklin suggest an Aristotelian realism about mathematics, instead of Platonism. For this they invoke the Armstrongian *truthmaker* approach to ontology which offers an alternative to the Quinean criterion of ontological commitment.

The last two papers of this collection in Part VI (“Natural Kinds”) are concerned with the metaphysics of natural kinds. Natural kinds like protons and proteins can be distinguished metaphysically: some of them are *determinate* kinds (e.g. protons) whose members are identical in their intrinsic natures; others are *determinable* kinds (e.g. proteins) whose members are other determinable or determinate kinds themselves. With natural kinds we can track the joints of the natural world. However, the ontological status of natural kinds is not so straightforward. Armstrong does not believe in natural kinds as genuine properties: he argues that kinds are conjunctive properties that existentially depend on or are entailed by their property conjuncts. Ellis thinks otherwise, and as a natural kind essentialist, he maintains that determinable kinds are *sui generis* properties and without them determinates could not exist; a determinate kind entails and depends on the determinable kind whose member it is. In her essay about determinable kinds, Emma Tobin criticizes both views because they do not reckon with *crosscutting* determinable kinds whose members are determinable kinds as well and do not depend on any other determinable or determinate properties or kinds. Similarly, in the last paper of this book, Corinne L. Bloch seeks a new way to give a correct account of natural kinds. She argues that we can define natural kinds as genuine properties without becoming essentialists and compromising our scientific world-view.

Part II (“Levels of Inquiry”) contains only Patrick McGivern’s essay about the structure of reality. It is generally admitted by realists that the world is layered, and on the fundamental level physics discovers those entities which are not just ontologically but also explanatory fundamental. However there are physical phenomena, e.g. the behavior of fluid during drop-formation, which cannot be explained by the molecular theory alone that describes the nature of fluids. In this case it seems that ontologically fundamental entities have no genuine explanatory adequacy and we need to appeal to higher-level entities. Or there may be another way to describe structure of reality which is closer to how science really works: instead of a level-based account McGivern offers a *scale*-based one. In terms of scales (spatial scales, temporal scales, energy scales, etc.), which are modes of descriptions, we may characterize the *same* objects in different ways, not different objects belonging to different levels.

I recommend this collection very highly to anyone who wants to become more familiar with contemporary realist metaphysics, its big issues, and the ways in which science can bear on metaphysics.

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