Anna Marmodoro, ed.
The Metaphysics of Powers: Their Grounding and their Manifestations.
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In recent years, discussions of powers (or dispositions) have gained ground in metaphysics, philosophy of science, philosophy of mind, and the history of philosophy. *The Metaphysics of Powers: Their Grounding and their Manifestations* provides eleven high quality essays by both well-established and relatively new philosophers in the field. Central to the collection is a critique of dispositional monism (or pandispositionalism), the view that all fundamental properties are ungrounded powers. A number of regress arguments directed at dispositional monism are evaluated in the collection, with proposals for dualist ontologies of powers and categorical properties (or qualities, which are essentially non-dispositional). Other themes are the necessity of the relation between powers and manifestations, the nature of manifestations, and dispositional analyses of causation. Anna Marmadoro's introduction helpfully groups and sketches the papers under these headings; here are three that convey the range of topics offered by the collection.

In 'Categories and the Ontology of Powers: A Vindication of the Identity Theory of Properties', Kristina Engelhard argues that pandispositionalism is subject to regress arguments which show that qualities must be given a place in our fundamental ontology. E. J. Lowe's 'No identity fixation' argument, for example, goes as follows. The identity of a power is fixed by its manifestation (e.g., fragility is the power to shatter). Yet, if the manifestation of a power were itself a power (pandispositionalism), then its manifestation would be necessary to fix its identity, ad infinitum. Thus on the assumption of pandispositionalism, the identity of a power is never fixed since the identity of a manifestation is also never fixed.

Engelhard takes the regress argument to show that qualities must be given a place in fundamental ontology if powers are to have identities. One option is ontological dualism, but Engelhard worries that it collapses into categorical monism and pursues instead an identity theory that develops the identity theories of C. B. Martin and John Heil. Identity theory takes a property to possess a dispositional feature, responsible for its modality, and a qualitative feature, responsible for its identity—and these features are taken to be strictly identical. Identity theory, presumably, would stop the regress argument, as properties aren't merely powers to manifest other properties, but have qualitative identities intrinsically.

Engelhard's interesting move is to wed identity theory to a category-ontology that associates the dispositionality of a property with a universal and the qualitativity of a property with a trope: "Insofar as a property is the universal *in rebus* in abstraction from the fact or state of affairs it is part of, it stands in nomic relations to different properties that demarcate its manifestation and hence exhibits the manifestation relation of it as a power" (53); "We consider the property's qualitativity insofar as we do not abstract from the fact or state of affairs that it qualifies but take it as part of the fact in question involving one and the same property. As trope the property makes a particular being this or that way" (54). Limited by space, Engelhard

doesn't develop her category theory here; perhaps future work will provide some clarification about the nature of universals, since there seems initially to be tension between taking a universal to be both something *in rebus* and an abstraction.

In 'Puzzling Powers: The Problem of Fit', Neil E. Williams wonders how it is that powers fit one another so as to produce the manifestation of one or more powers. The problem stems from three widely held theses about powers. (1) *The Intrinsicality Thesis:* powers are intrinsic properties whose instances do not depend on the existence of any other contingent objects. (2) *The Essentialist Thesis:* the essential identity of a power is given by the set of manifestations it is for. (3) *The Reciprocity Thesis:* manifestations are often produced mutually by powers in distinct objects or in parts of objects working together. After fleshing out these theses, Williams states the problem of fit: "the problem is that powers have to work together when they produce manifestations (reciprocity), but as they are not relations (intrinsicality), and they cannot change with the circumstances (essentialism), the fact that they are causally harmonious is without explanation" (89).

Williams thinks that the problem of fit is solvable, but not, he argues, by way of rejecting any of the three theses about powers. He argues instead for what he calls 'power holism': "The specific, determinate nature of each power … depends on the specific, determinate nature of other powers with which it is arranged in the system of powers" (96). The idea here is to give an account of how powers are structured with respect to one another: all powers are given at once, collectively determining their abilities, giving each power at least one reciprocal power partner. Williams recounts two ways that systems of powers may be. *Strong power holism* imagines that a single large system of powers exists, where each power is connected with every other, all of them collectively determining each other's abilities. *Weak power holism* takes the connections between powers to be limited to very few others, giving us multiple systems of powers that fail to interact with each other. Either way, should it be that power holism is true and powers collectively determine each other's natures, reciprocity is explained and the problem of fit solved.

Williams provides some metaphysical theories that show how all powers are given at once and co-determine each other. First, we may think that the world described by power holism is a brute fact; there is no explanation as to why certain properties fit the way they do. Second, we may think properties are Platonic beings that confer on their instances in the actual world the necessary connections that they enjoy in eternity. Williams's third and preferred option is naturalistic monism, which takes its cue from Spinoza and Hegel, treating 'distinct' objects and properties as features grounded in a single reality that is the cosmos. The unity of being explains how all powers could be given at once—an unexpected conclusion to an interesting problem.

In 'Causal Powers and Categorical Properties', Brian Ellis argues that categorical properties must be included in our fundamental ontology, so dispositional monism is false, focussing on spatiotemporal locations to make his case. (Other categorical properties, such as size and speed, possibly depend on spatiotemporal locations.) Two arguments show how causal powers depend on locations. First, any object possessing a causal power must be contingently located somewhere, making location an essential feature of the individuation of instances of causal powers. Second, locations are essential features of the laws of action that characterize the

essential natures of powers. The law of action A for a causal power P describes what the property does in circumstances C. Let E be the effect of P and C, and E_0 the effect of C without P. The law of action for P, then, is $E-E_0 = A(P,C)$: it is metaphysically necessary that E, when P in C. But a law of action, according to Ellis, makes essential reference to the location of P-bearers and of the objects that they interact with. For example, the law expressing the elastic action of a wire pulled by a weight will state the location of the weight, whether it is resting on something else, etc. Without inclusion of locational properties, the law of action of the wire cannot tell us whether or not we should expect the effect on the wire by the weight to be $E-E_0$.

Yet locations are not themselves causal powers. There are no laws of action of locations, so locations are bereft of powers whose natures can be characterized by such laws. Also, all causal powers are located somewhere, but instances of location do not themselves have locations. Finally, locations do not have causal powers essentially, since it seems that a location would remain after all the causal powers that resided there were removed.

Anticipating objections, Ellis addresses (among others) the dispositional monist's argument that categorical properties are unknowable: if a property is to be known it must have the power to affect us, so if categorical properties are not powers, they must be (or have) unknowable quiddities. Ellis argues in response that categorical properties, like the shapes and orientations of things, are known only by means of the causal powers that are located within them. We know of categorical properties since they partly determine from where causal powers act to affect us, with the perception of a square object, for instance.

In the last part of the essay, Ellis argues that propensities, like the half-lives of radioactive elements, are dispositions but not causal powers (which are also a species of dispositions). The reason why propensities are not causal powers is that powers manifest themselves in causal processes, which involve energy transferences from one physical system to another, and effecting a physical change in it. But propensities, according to Ellis, dispose their bearers to act independent of causal processes: the contingent location of an atom of plutonium-238 has no bearing on the fact that it has a half-life of 88.7 years. Since such an atom has this chance of decay no matter where it is, it follows that radioactive decay involves no causal processes and the propensity is an unconditional property.

But Ellis's qualification seems incorrect. It is true that half-lives are possessed by atoms unconditionally, but only in specific circumstances, namely, in those that effect no change in chances of decay. There are, for example, circumstances that do raise chances of decay for some atoms, like being an atom of fissile material in a body that has achieved critical mass. An atom in this circumstance has a chance of decay far greater than it would have had located outside the material undergoing chain reaction, and almost certainly decays because of the circumstances. The example of a half-life propensity suggests treating propensities as a species of causal powers that accommodates the possibility of conditional and unconditional manifestations, and not as a species of dispositions the identities of whose members are completely divorced from possible causal processes.

The strength and variety of the papers in this volume represents a maturity in the metaphysics of powers with a number of programs up and running—some of them seeking

collaboration in vision, others locking horns over territory. It offers excellent depth for comparative reading and it's a must read for anyone working in the ontology of powers today. Other papers are by E. J. Lowe, Anna Marmodoro, John Heil, Jennifer McKitrick, Toby Handfield, Stephen Mumford and Rani Lill Anjum, Alexander Bird, and Markus Schrenk.

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