causation, nor do they represent the effects of their operation (p. 74). They represent potential causes rather than actual ones. As a consequence, vector diagrams do not actually depict the processes that occur when manifestation partners meet (cf. p. 26), they only depict the powers of these manifestation partners.

Speaking of manifestation partners: there seems to be no way of adequately representing active and passive powers in the same vector diagram. Mumford and Anjum argue that not all causation involves an active and a passive part (p. 36), and they might be right. As they admit, however, most cases of causation do involve the exercise of both active and passive powers. For instance, the power of a book to be read can only be exercised when someone reads it (p. 38). Now as Aristotle shows in *Physics* III 3, the exercise of an active power and the exercise of the corresponding passive power are one and the same event. For the reader to read and for the book to be read are one and the same process. This means that if vectors represent dispositions and dispositions are identified by their manifestation, the vector that represents the power of the reader will have to be identical to the vector that represents the power of the book. There can be no separate vectors for passive powers.

I conclude that Mumford and Anjum's pan-dispositionalism causes more problems than it solves. However, it is not required for the rest of their position, and if one leaves it aside, their book is still the kind of book I would like to have written, and certainly a book I would urge everyone who cares to read.

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*Physical Realization*. By Sydney Shoemaker. (Oxford: OUP, 2007. pp. x + 151. Price £ 34.00.)

From the beginning, Shoemaker's goal is clear: 'The purpose of this work is to give an account of property realization and microrealization and the relations between them, and to discuss their bearing on a number of central

topics [including] mental causation, personal identity, material constitution, emergence, and the phenomenal character of sensory states' (p. 4). Anyone interested in these topics will recognize that a crucial role is played by notions at least analogous to *property realization* and *microrealization*. Whether or not the reader agrees with Shoemaker's account of these notions, the book will serve to sharpen one's understanding of the mentioned topics.

Following ch. 1's instructive introduction, ch. 2 outlines 'an account of the relation philosophers most commonly have in mind when they speak of the realization of properties, namely the realization of an instance of one property by an instance of a different property' (p. 31). Philosophers speak of property realization when they deem mental properties to be multiply realizable: *being in pain* is not identical to being in brain state Q since pain is sometimes realized by brain state Q' instead.

Crucial to Shoemaker's account is the distinction between a property and a property-instance. The surface of a particular tomato is an instance of the property red. Property-instance realization is defined in terms of property realization. Property realization is then defined in terms of set-theoretic relations between causal features of the properties.

Let P and Q be properties. A P-instance is realized by a Q-instance just in case they are instantiated in the same thing and *Q is a realizer of P*. For example, a particular patch of red is realized by a patch of scarlet just in case red and scarlet are instantiated by the same patch, and *scarlet is a realizer of red*.

Shoemaker's account of property realization will invoke the notion of a *causal feature*. A *forward-looking* causal feature of a property is the property's being such that its instantiation in certain circumstances (i.e., being coinstantiated with certain other properties) has certain effects. For example, being red is such that its instantiation *in traffic lights* causes cars to stop. A *backward-looking* causal feature of a property is similarly defined in terms of what sorts of states of affairs can cause the instantiation of the property.

Property Q is a realizer of property P just in case (i) P's forward-looking causal features are a subset of Q's forward-looking causal features and (ii) Q's backward-looking causal features are a subset of P's backward-looking causal features. For example, scarlet is a realizer of red just in case (i) red's forward-looking casual features (e.g., stops cars when instantiated in a traffic light) are a subset of scarlet's forward-looking causal features and (ii) scarlet's backward-looking casual-features (e.g., what, in certain circumstances, turns things scarlet) are a subset of red's backward-looking causal features.

One concern with this account is that it appears to ultimately rely on an unanalysed notion of realization. We were promised an account of property-instance realization. The account was initially given in terms of property realization, and then property realization was explained in terms of set-theoretic relations among causal features. But these causal features are themselves

properties. How exactly are *these* properties related? I shall illustrate the concern using Shoemaker's example of the physical realization of mental properties (pp. 19–20).

Consider one's belief that it's raining = Br. The property *believes that it is raining* has the causal feature Cu = 'causing one to get an umbrella (when instantiated with *other mental properties* such as desiring to not get wet)'. Let Br be realized by physical property P1. Shoemaker asserts that Cu is also a causal feature of P1. However, Shoemaker recognizes that those 'other mental properties' are themselves physically realized in (say) properties P2, P3, and P4. And here is where problems arise.

Shoemaker asserts that 'in the first instance' the relevant causal feature of P1 is 'causing one to get an umbrella (when instantiated with *other physical properties* P2, P3, and P4)'. Shoemaker ought to allow that since 'getting an umbrella' is physically realized by P5, the relevant causal feature is really: 'Causing P5 (when instantiated with P2, P3, P4)'. Call this causal feature 'Pu'. We now have:

> *Mental causal feature Cu of Br*: causing one to get an umbrella (when instantiated with other mental properties).
>
> *Physical causal feature Pu of P1*: causing P5 (when instantiated with physical properties P2, P3, and P4).

According to Shoemaker, 'We can now say that when mental property Br is realized by physical property P1, the mental causal features of Br [e.g. Cu] are realized by physical causal features of P1 [e.g. Pu]. But I should emphasise that these mental causal features of Br are shared by P1; they are realized in P1 by physical causal features' (p. 20). But why does P1's set of causal features contain Cu when it already contains Pu?

The answer appears to be that Pu *realizes* Cu. But this is precisely the relation we want an account of: What does it mean for Pu to realize Cu? Here we are taken to a terse footnote: 'Here I speak of causal features being realized in other causal features. Since causal features do not themselves have causal features, this cannot be realization in accordance with the subset conception. The idea here is just that a property can have a causal feature in virtue of its realizer having a certain causal feature' (p. 20 n15).

But that doesn't tell us why P1's set of causal features contains Cu on top of Pu. It seems P1 has Cu because P1 has Pu and Cu is 'realized' in Pu. But what does realization mean here? One option is identity. But Shoemaker appears to oppose this interpretation (p. 17, pp. 48–49). And anyway, an independent account of how identity could play this role would be required. Alternatively, realization is here being taken as brute or inexplicable. But then the account is either circular or (at best) incomplete.

It is worth considering how this concern affects the various applications of the account. For example, consider the problem of explaining how mental

properties could do causal work over and above their physical realizers (pp. 45–53). Can this problem be solved without a clear account of causal-feature realization?

Whatever one makes of Shoemaker's account of realization, one will likely be rewarded by the in-depth discussion of topics in which the notion of realization plays a crucial role. Chapter 3's account of *microrealization* is intended to answer the question: 'in virtue of what is a microphysical state of affairs a realizer of a property instance?' (p. 36). Since a given microphysical state of affairs can be thought of as a property-instance (an instance of being such-and-such a state of affairs), the property realization account applies here straightforwardly. Though the reader may wish to consider whether the above concern applies too.

Chapter 4 argues that there are no functional properties, only functional concepts; that causal power-endowing emergent microstructural properties are consistent with physicalism; and also offers an account of when a disjunction of properties is itself a property. Chapter 5 argues that some objects materially constitute others and offers an account of what it is for a set of microentities to make up a macroscopic object; it defends endurantism over perdurantism; and defends the coherence of a distinction between thick properties (which have persistence conditions) and thin properties (which don't). Chapter 6 offers an account of the realization of qualia. The book concludes with an appendix containing a useful outline of the causal theory of properties, on which properties have their causal profiles essentially.

There is a wealth of philosophical exploration and argumentation in these chapters. Whether or not the reader agrees with Shoemaker's account of realization, one is forced by the later chapters to consider how one's own account fairs across such a broad range of issues. Such an exercise is of clear value to any philosopher interested in these topics and so I recommend this book to all such philosophers.

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*The Norm of Belief*. By JOHN GIBBONS. (Oxford: OUP, 2013. Pp. xv + 302. Price £45.00 h/b.)

John Gibbons' *The Norm of Belief* concerns a puzzle. The puzzle concerns what you ought to believe. On the one hand, there is a strong intuitive pull to affirming that it is facts about *the world* that determine what you ought to