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The Ontology of Things, Properties and Powers[1]

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Abstract. Whilst the concept of causal *powers* is central to much post-positivist social science in general, and to critical realism in particular, it has not been significantly developed by critical realists since the initial work of Harré & Maddden and Bhaskar in the mid 1970s. To deepen our understanding of powers we need to start with a 'package' of related terms. Part one of the paper introduces this 'package', clears up some terminological ambiguity and inconsistency, and focuses upon *things, properties and powers*. The real problems begin when we try to figure out how things, properties and powers relate to one another. Part two introduces and evaluates three possible ontologies: an ontology where powers are primary; an ontology where properties are primary; and an ontology where neither properties, powers (or things) are primary, but all emerge to form a unity. The last ontology is defended. Part three deals with ambiguities surrounding three other terms that often crop up when discussing powers, namely, *dispositional properties*, *transfactuals* and *processes.* The net result is a far less ambiguous concept of powers, firmly anchored in an ontology of things, properties and powers as a unity.

Introduction

Whilst the concept of *causal powers*, or *powers* for short, is central to much post-positivist social science in general, and to critical realism in particular, it has not been significantly developed by critical realists since the initial work of Harré & Maddden[2] and Bhaskar[3] in the mid 1970s.[4] The concept has, however, been developed outside the critical realist orbit in a literature dedicated to the *metaphysics of dispositions* – in this literature, the term 'dispositions' is virtually synonymous with 'powers'. Unfortunately, this literature is marred by terminological ambiguity and inconsistency, making it extremely difficult to identify and, therefore, evaluate competing ontological claims vis-à-vis powers. The overriding objective of this paper, therefore, is to engage in some ground work, reducing terminological ambiguity and inconsistency in order to improve our understanding of powers.

The starting point for analysis is *not*, however, with powers themselves, but with a 'package' of terms that are invariably invoked in discussions of powers. Part one of the paper introduces this 'package', clears up some terminological ambiguity and inconsistency, and focuses upon *things, properties* and *powers*. The real problems begin when we try to figure out how things, properties and powers relate to one another. Part two introduces, and evaluates, three possible ontologies: an ontology where *powers are primary*; an ontology where *properties are primary*; and an ontology where *neither properties or powers (or things) are primary, but where all three emerge to form a unity*. The last ontology is defended. Part three deals with ambiguities surrounding three other terms that often crop up when discussing powers, namely, *dispositional properties*, *transfactuals*

[1] I wish to thank Brian Pinkstone, Ruth Groff and two anonymous reviewers, for insightful comments on earlier drafts of this paper.

[2] Rom Harré & E. Maddden, *Causal Power: A Theory of Natural Necessity* (Oxford: Basil Blackwell, 1975)

[3] Roy Bhaskar, *A Realist Theory of Science*, (Harvester-Wheatsheaf, 1978).

[4] One recent exception is Tuukka Kaidesoja 'Exploring the Concept of Causal Power in a Critical Realist Tradition', *Journal for the Theory of Social Behaviour*, Vol. 37, No.1, (2007), 63-87.

and *processes.* The net result is a far less ambiguous and more consistent concept of powers, firmly anchored in an ontology of things, properties and powers.

1. Things, properties and powers

This 'package' contains terms with a family resemblance to powers such as 'affordances', 'abilities', 'capacities', 'dispositions', 'forces', 'liabilities', 'potentialities', 'potencies', 'processes', 'propensities', 'trends', 'tendencies'. These terms are themselves often used in conjunction with terms such as 'attributes', 'constituents', 'categories', 'categorical constitutions', 'dispositional properties', 'features', 'qualities', 'grounds', 'natures', 'properties' and 'structures'. And these terms are almost always used in conjunction with terms such as 'objects', 'complex objects', 'natural objects', 'particulars', 'powerful particulars', 'substances' and 'things'. No single writer uses all these terms, some writers try to explain their usage of the terms they do use, others make no reference to differences between (some of) them and others seem to use them rather carelessly. [5] Moreover, they are often used without being properly introduced and defined and they often appear to mean different things to different writers.

The real problem with such this ambiguous and inconsistent 'package' of terms is that it shrouds competing ontologies with a kind of conceptual fog, making it extremely difficult not only to evaluate them, but even to identify them in the first place. Disambiguating terminology and establishing consistency serves to reveal ontological commitments to (minimally) *things, properties and powers*. This does not, of course, exhaust the range of ontological discussion because there are also commitments to events and processes (which I will deal with below) and states of affairs[6], universals, tropes[7] or predicates[8] (which I cannot deal with in this paper).

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[5] Harré briefly re-visits powers and tendencies. Whilst he does add some ideas on dispositions, he does not offer the kind of depth I think the discussion really needs. For example, whilst I agree that 'dispositions' belong with 'other concepts of the same family such as tendencies, propensities, powers and forces', I want to know a little more about the similarities and differences between these concepts. Rom Harré, *Varieties of Realism: A Rationale for the Natural Sciences*, (Oxford: Basil Blackwell, 1986), 284.

[6] For an ontology that includes *states of affairs* (such as 'the cat is on the mat'), see Peter Ossorio, 'What There Is, How Things Are', *Journal for the Theory of Social Behaviour*, Vol. 27, No. 2-3, (1997) 149-172. Note, however, that for Ossorio, a things' properties constitute a state of affairs (e.g. the cat has the property of being on the mat) so are encapsulated in my ontology that includes properties.

[7] Many writers claim that properties are universals. If one accepts this, there seems no obvious reason not to extent this to powers. The universal property of 'redness' can be extended to the universal power to 'reflect the electromagnetic spectrum around 650 nm'. A universal, however, must be present in its instances. Just as the property 'redness' must be present in particular red things, then so too must the universal power to 'reflect the electromagnetic spectrum around 650 nm' be present in particular red things. Mumford puts this succinctly: 'commitment to the view of properties as clusters of powers should be independent of the issue of whether properties are tropes or universals. If they are universals, a cluster is an instantiation of that universal with an exact type of identity of powers running through all such instantiations. If they are tropes, each cluster is a particular, related to other such particulars by similarity relations' Stephen Mumford, *Laws in Nature*, (London, Routledge, 2004), 174. For this reason I omit discussion of universals and tropes. On tropes see Johannes Persson, 'Tropes as Mechanisms', *Foundations of Science* No. 10, (2005), 371-393.

[8] I omit a discussion of predicates. To the extent I can understand the ambiguous way the term is used, and the inconsistent set of things that are said to be predicates, I agree with Armstrong that it is implausible 'to attempt to evade properties by means of predicates'. David Armstrong, 'Properties', in D. Mellor and Alex Oliver, *Properties*, New York: (Oxford University Press), (1997), 161. Shoemaker refers to 'dispositional predicates' exemplified by terms like 'flexible', 'soluble', 'malleable', 'magnetized' and 'poisonous'; and 'non-dispositional monadic predicates' exemplified with terms like 'square', 'round' and 'made of copper'. Sydney Shoemaker, 'Causality and Properties', in D. Mellor and A. Oliver, A.

Things

Whilst many of the substitutes mentioned in the 'package' (e.g. objects, particulars, entities or phenomena) could be used, I prefer the term 'things' because it suggests generality and neutrality and does not come with baggage as do terms like 'phenomena' – which may suggest a commitment to phenomenology. In my lexicon, the term 'things' can refer to *physical* things (e.g. lungs, people, rocks, oceans, icebergs and planets); *artefactual* things (e.g. computers, cosmetics, companies and dominos); *social* things (e.g. organisations and relations such as class and gender) or *ideal* things (e.g. discourses, theories and beliefs).[9] And whilst it makes perfect sense, especially in everyday language, to refer to a power or a property as a thing, in this context it is far better to avoid this use because we need to differentiate between things, properties and powers. Things are not 'empty shells', they have an intrinsic constitution or structure, or are intrinsically constituted or structured. What any thing's constitution is, of course, is an open question. As we will see below, whilst use of the term 'things' (or some substitute) cannot be avoided, and crops up repeatedly, it is almost always used without explicit ontological elaboration. Thus it is sometimes unclear, for example, whether things *are* said to be powers or things are said to *have* powers.

Properties

Whilst many of the substitutes mentioned in the 'package' (e.g. attributes, categories, constituents, features or characteristics) could be used I prefer the term 'property' because it suggests generality and neutrality, and does not come with baggage as does a term like 'categories'. In my lexicon, the term 'property' can refer, for example, to the property of: being equiangular; being extended in space; being red; being hard; being frozen; being the prime minister of the UK; having an engine or gearbox or having employees. Reference to a thing's intrinsic constitution or structure is often a reference, in part, to its intrinsic properties.[10] And reference to a things' intrinsic properties is often a reference to its various intrinsic components or parts. The intrinsic properties of a capitalist company for example, are, *inter alia*, having a workforce, plant, machinery, IT systems, semi-finished products, raw materials and socio-cultural management techniques.

Powers

Many of the substitutes mentioned in the 'package' (e.g. capacities, dispositions and liabilities) could be used. Indeed, some writers differentiate between powers and liabilities[11] and others differentiate between capacities and powers.[12] Moreover, the term 'dispositions' is preferred to powers by metaphysicians. I prefer the term 'powers' because it is used widely in social theory and critical realism. I follow Collier in using 'powers' as a non-technical term, designating what something does, or can do.[13]

Properties, New York: (Oxford University Press), (1997), 232-4. Others would simply refer to these as properties – e.g. of being malleable or made of copper.

[9] For an elaboration of these four modes of reality see Steve Fleetwood, 'The Ontology of Organisation and Management Studies: A Critical Realist Approach' *Organization,* Vol. 12, No. 2, (2005) 197-222.

[10] See Achinstein 'II. The Identity of Properties', *American Philosophical Quarterly*, Vol. 11, N0. 4, (1974), 257-275 for an elaboration on just what kind of phenomena might count as properties.

[11] Rom Harré, 'Powers', *British Journal of the Philosophy of Science*, Vol. 21, (1970): 81-101, 88-90. The power of a domino to topple is a power, whereas its power *to be* toppled is often said to be a liability. In this case, a liability seems to be a special kind of power, a power to be influenced.

[12] Nancy Cartwright, 'Where Do Laws of Nature Come From?' *Dialectica*, Vol. 51, No. 1 (1997), 74, differentiates between capacities and powers, but not between powers and dispositions.

[13] Andrew Collier, *Critical Realism: An Introduction to Roy Bhaskar's Philosophy* (London: Verso, 1994), 62.

Armed with a relatively clear definition of things, properties and powers, we can make a start on trying to figure out how these three phenomena relate to one another.

2. Three possible ontologies involving things, properties and powers

The following three sections elaborate upon an ontology primarily of powers; an ontology primarily of properties and an ontology where neither properties, powers (or things) are primary, but all emerge to form a unity. Of these three possible ontologies, I think the first two are problematic and I defend the third. Before these ontologies are elaborated upon, note two things.

First, ambiguous and inconsistent use of terminology raises several problems for anyone trying to give a systematic expression. The ontologies that I present systematically, might actually be unsystematic. They might even be based upon misunderstanding, either by me struggling to interpret other writers, or by other writers struggling to interpret each other. Different writers seem to advocate different ways of dealing with things, properties and powers, and attribute certain positions to their interlocutors which the latter may or may not agree with. Some writers even reject one or other of the terms. But the fact is, irrespective of ambiguity and inconsistency, a discussion of ontology cannot avoid dealing with (at least) things properties, and powers. Second, the terms 'primary' and 'secondary' crop up in discussion, often recalling the work of Locke. I will use these terms in an ontological context to try and express the different ways in which things, properties and powers might exist and relate.[14]

Ontology 1: powers are primary

This ontology comes in strong and weak versions. The strong version is expressed via claims, suggestions or sometimes just hints that: the world consists, exclusively of powers with no remainder; primarily of powers and secondarily of properties; powers come first, and properties second; properties are clusters or bundles of powers; properties just *are* powers; properties are made from, and reducible to, powers with no remainder; and so on. All this implies an ontology of what Heil calls 'naked powers'.[15] The following comments exemplify this ontology.

> [P]roperties are understood as clusters of powers…The cluster view is that there is nothing more to a property than its powers and that the powers fix the identity of the property…Powers…exhaust the properties. There is no remaining residue or other feature of a property in addition to its powers.[16]

> Thus far I have failed to address an ambiguity with respect to the precise nature of the relation between causal properties and dispositions. This ambiguity is present in the claim that causal properties 'confer' dispositions for behaviour. There are two obvious ways in which one might explain what 'confer' means here. One might hold that dispositions are distinct from, but nonetheless and in some sense 'attached' to causal properties...On the other hand, one might hold that causal properties just *are* collections of dispositions, being composed of them, as it were…On this interpretation…causal properties simply consist in capacities of objects to act and to

[14] There are, of course, ambiguities with the terms 'primary' and 'secondary', so (to avoid further intellectual regress) I ask the reader to interpret them promiscuously. When I use these terms, I will endeavour to make the same point in several ways to get the point across.

[15] John Heil, 'Kinds and Essences' *Ratio*, XVIII, (2005), 405-419, 413.

[16] Stephen Mumford, *Laws in Nature*, (London, Routledge, 2004), 171. See also, Stephen Mumford, 'Kinds, Essences and Powers', *Ratio,* No. XVIII, (2005), 420-436; and Stephen Mumford, 'Laws and Lawlessness' *Synthese*, No. 144, (2005), 397-413.

> be affected in various ways in particular circumstances. Such properties would comprise anything from a single disposition to a cluster of dispositions.[17]
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> It is also worth noting that the 'objects' that Bhaskar takes to be ultimate are powers (indeed potentialities) rather than entities. [18]
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> Mass, charge and spin, like all properties of the fundamental objects, are powers or dispositions. In one sense, this is *all there is* to the electron: an electron is an object with certain intrinsic powers.[19]

An ontology where powers are *strongly* primary is problematic. It implies either the existence of free-floating or disembodied powers, separate from properties and things; or it implies the reduction of properties and things to powers with no remainder. I am not sure what such disembodied or reduced powers would look like and I cannot think of any examples. Powers are always, powers *of,* or powers *possessed by*, some thing, and all things have properties. More specifically, the primacy of powers implies a spatio-temporal ordering where powers can exist in space-time isolation from properties and/or things. This is highly problematic and to understand why, consider a biological analogy. We can, quite legitimately, say that the biological has ontological primacy over the social. This is because, although social mechanisms and processes can alter biological mechanisms and processes, they can only do so in accordance with the laws that govern, and hold at the level of, the biological. Biological activity can occur in space-time isolation from the social, but the reverse is not true; social activity cannot occur in space-time isolation from the biological. Biological activity is, therefore, primary and social activity is secondary. The lessons can, of course, be generalised beyond biology. If the primary can exist without the secondary, then we can legitimately differentiate between primary and secondary; but if the primary *cannot* exist without the secondary, then we cannot legitimately so differentiate.

Heil spots problems with this ontology:

> What of a world consisting of arrangements of objects possessing exclusively dispositional properties? Think of a line of upright dominos arranged in a circular pattern so that one domino's toppling topples the rest. Now suppose that all there is to a domino is the power to topple and to be toppled. It is hard to see how any toppling could take place because it is hard to see what would be toppled…
>
> > …We meet here a notorious conundrum in metaphysics. Is it possible for anything to be constituted by nothing but powers? (Campbell citing Boscovich).
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> The difficulty here is analogous to the difficulty of imagining a world made up exclusively of relations. Relations require relata; objects possessing powers to affect other objects require qualitative 'filling in' of some sort.[20]

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[17] Anjan Chakravatty, 'The Dispositional Essentialist View of Properties and Laws', *International Journal of Philosophical Studies*, Vol. 11, No. 4, (2003), 393-413, 399-400. Notice that Chakravatty is aware of what I call 'strong' and 'weak' versions of this ontology – I will use part of the quotation again in a moment.

[18] Ruth Goff, *Critical Realism, Post-positivism and the Possibility of Knowledge*, (London: Routledge, 2004), 47.

[19] Heil, 408-9 - writing about Ellis.

[20] Heil, 415.

The weak version of this ontology is expressed via claims, suggestions or sometimes just hints that: powers ground properties; properties are what they are in virtue of their powers; properties are identified via their powers; powers are distinct from, but 'attached' to, properties. The following comment is actually part of a longer comment from Chakravatty noted above, and focuses on the first meaning of 'confer'.

> There are two obvious ways in which one might explain what 'confer' means here. One might hold that dispositions are distinct from, but nonetheless and in some sense 'attached' to causal properties.[21]

This weak version has merit in the sense that it allows properties into the ontology, even if these properties are secondary.

Ontology 2: properties are primary

This ontology also comes in strong and weak versions. The strong version is expressed via claims, suggestions or sometimes just hints that: the world consists entirely of properties and that powers are a product of ontological double vision; powers are made from, and reducible to, properties with no remainder. The following comments exemplify this ontology:

> [T]he regularity conception of laws and recent nomic necessitation accounts…both take properties to be categorical. That is, properties have no essential or causal powers.[22]

> [The] 'rationalist' view is, I believe, demonstrably wrong. For one thing, such intrinsic powers would simply be redundant: there is no need to postulate anything other than intrinsic categorical properties (for example, molecular structures and movements) which as they interact lead on causally to various results. Secondly, such intrinsic powers are pretty clearly products of metaphysical double vision: they just are the causal processes which they are supposed to explain seen over again as somehow latent in the things that enter into these processes. Once we embark on this procedure, we can hardly stop: if for any causal process we need to postulate a pre-existing power or powers, latent in each of the things that enters relevantly into the process, we shall have to do the same for all. *Copper will have to have, over and above its atomic and molecular structure, a power of conducting electricity*…As a set of serious ontological claims, this is gratuitous multiplication. *It is far more reasonable to suppose that electrons and the like have, intrinsically, merely whatever categorical features they do have, and that these…generate the causal behaviour of which 'disposition' or 'powers' are a shadow*.[23]

> [Those] who take a realist view believe that there will always be an occurrent ground; the behaviour which manifests the disposition will be caused (partly) by some occurrent feature of the thing…On this issue I think that the realists are right…In crystalline sugar the feature causally relevant to its solubility in water will be

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[21] Chakravatty, (2003), 399-400.

[22] Alexander Bird, 'The Dispositional Conception of Laws', *Foundations of Science*, No. 10, (2005), 353-370, 353. See also Alexander Bird, 'Laws and Essences', *Ratio*, XVIII, (2005), 437-461.

[23] J. Mackie, 'Dispositions, Grounds and Causes', *Synthese*, Vol. 34, (1977), 361-370, 366, emphasis added.

> something about the bonds between the molecules in the crystal structure…The occurrent property of the sugar is a categorical one, not a passive power.[24]

For Mackie, powers are simply redundant: a things' properties are sufficient to account for whatever events the thing manifests. It is properties, not powers, that generate causal behaviour. In rejecting powers as the redundant equivalent of properties, Mackie rejects an ontology where powers are primary and accepts, instead, an ontology where properties are primary.

An ontology where properties are *strongly* primary is problematic. It reduces powers to properties and, in the process, misses several important distinctions. First, the term 'properties' is, typically, used to designate what something *has*. The term 'power' is, typically, used to designate what something *does or can do*. The two terms are inextricably linked because what a thing does or can do depends on the properties it has. As the opening sentence of Mellor and Oliver's collection entitled *Properties* puts it: 'Particular objects have properties'.[25] A domino *has* properties of extension in space and hardness, in virtue of which it does or can, topple; it has the power to topple. Properties, then, are *not* 'doings' they are one of the *causes* of 'doings'. Second, notice the phrase 'does or can'. There is a difference between a domino being able to (can) topple and a domino actually (does) toppling. This is not a difference that makes sense when applied to properties: being hard and being able to be hard makes no sense. Yet this difference is reflected in two ideas that I will briefly note here, then elaborate upon in part three. (i) Powers can exist at different moments in a causal chain. Powers can be *exercised*, that is, enduring without manifesting in anything; or they can be *actualised*, that is, manifesting or doing whatever it is they can do. (ii) A power that is exercised but not actualised is acting *transfactually*. It can do X, but it is not doing X at this moment in time. Because the strong version of this ontology reduces powers to properties, it misses these important distinctions.

Moreover, an ontology where properties are *strongly* primary implies either the existence of free-floating or disembodied properties, separate from powers and things; or it implies the reduction of powers and things to properties with no remainder. I am not sure what such disembodied or reduced properties would look like and I cannot think of any examples. Properties are always, properties *of,* or properties *possessed by*, some thing, and all things have powers. More specifically, the primacy of properties implies a spatio-temporal ordering where properties can exist in space-time isolation from powers and things. This is highly problematic - for the same reasons noted above when I used a biological analogy to refute the primacy of powers. Using the same rationale, we can say that properties cannot exist occur in space-time isolation from powers and things.

The weak version of this ontology is expressed via claims, suggestions or sometimes just hints that: properties ground powers; properties instantiate powers; powers are what they are in virtue of their properties; properties instantiate powers; powers are distinct from, but 'attached' to, properties. The weak version is correct in the sense that it does not imply the existence of free-floating or disembodied properties, separate from powers and things, nor does it imply the reduction of powers and things to properties.

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[24] Mackie, 366.

[25] The rest of the collection goes on to reveal just how complicated properties are. I have to agree, however, with Armstrong's light-hearted comment that discussion of properties involves 'a sort of metaphysicians paradise in which philosophers can wander, arguing'. D. Armstrong, 'Properties' *op cit* in Mellor, D. and Oliver, A. *Properties*, New York: (Oxford University Press), 160.

> A different distinction is between powers, in a sense I am about to explain, and the properties in virtue of which things have the powers they have…For the moment, *we can say that a thing has a power in virtue of having certain properties*…Properties here play the role, vis-à-vis powers, that primary qualities play in Locke: it is in virtue of a things' properties that the thing has the powers (Locke's secondary and tertiary qualities) that it has.[26]

This weak version has merit in the sense that it allows powers into the ontology even if these powers are secondary.

A brief note on things

Before I move on to the third ontology, it is worth reflecting upon the place of 'things' in the previous two ontologies. 'Things' are repeatedly alluded to, but they remain shadowy phenomena that lurk in the background, unspecified and unelaborated. In the strong versions, things are reducible to powers or properties with no remainder. In the weak versions, things are somehow 'attached' to powers and/or properties, but the nature of the attachment is ambiguous. Despite the fact that no-one seems to be particularly interested in things in their own right, the very impossibility of discussing powers and/or properties without mentioning things, strongly encourages the idea that things are necessary for properties and powers. The fact that things have not been explicitly specified and elaborated upon does not mean that they do not feature *implicitly* in the two previous ontologies. Indeed, properties and powers have to be borne or carried and so require a carrier or bearer. The 'identity of a power can only depend on how it disposes its *bearer* to behave' as Ellis puts it.[27] A domino, for example, is the thing that carries or bears the power to topple and be toppled. Implicit in the two previous ontologies, then, especially the weak versions, are suggestions or sometimes just hints that: things ground powers and properties; powers and properties are what they are in virtue of things; powers and properties are distinct from, but 'attached' to, things; things are clusters or bundles of powers and properties. In the following ontology, 'things' cease to be shadowy phenomena, but form an *explicit* part of the ontology.

Ontology 3: things, properties and powers form a unity

Things, properties and powers are not primary or secondary, and things, properties and powers do not exist in spatio-temporal isolation from one another as in the two previous ontologies. If the primary cannot exist without the secondary, not only can we not assign ontological primacy to one of the pair, the two things must be aspects of the one unified phenomena.[28] And this is the case for powers, properties and things. Powers cannot exist occur in space-time isolation from properties and things. Powers, properties and things are three aspects of the one unified phenomena.[29]

Things, properties and powers all *emerge* simultaneously to form a unity. The moment a thing emerges from other things (with their own properties and powers) so too do its properties and powers. We can state this several ways, and I do so to try and make matters as clear as possible. Things, properties and powers are emergent from, but irreducible to, other things, properties and powers. Things have properties and these properties instantiate powers. Things have properties and these properties ground powers. Powers are distinct from, but 'attached' to, things and

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[26] Shoemaker, 232-3, emphasis added.

[27] Brian Ellis, 'Universals, The Essential Problem and Categorical Properties', *Ratio*, XVIII, 462-472, 463, emphasis added.

[28] I wish to thank an anonymous referee for drawing my attention to the possibility of spatial as well as temporal separation and for providing the biological analogy.

[29] I wish to thank an anonymous referee for drawing my attention to the possibility of spatial as well as temporal separation, and for providing the biological analogy.

properties. Properties are distinct from, but 'attached' to, things and powers. Things are distinct from, but 'attached' to, properties and powers. This avoids the problems of implying that one member of the triad is free floating or disembodied from, or reducible to, the other two members of the triad. It also avoids the problems of implying that one member of the triad can exist in spatio-temporal isolation from the other two. Ontology three takes what is valid from the previous two (weak versions of the) ontologies, and builds upon them. Consider two examples.

- The moment a lump of ice breaks off a glacier and falls into the Arctic Ocean, an iceberg emerges. At the *same spatio-temporal moment* the icebergs' properties (e.g. being dense, white and with a temperature below freezing) emerge as do its powers (e.g. to float on water and to sink ocean liners).

- The moment a capitalist assembles an appropriate set of components, a capitalist company emerges. At the *same spatio-temporal moment* the companys' properties (e.g. having a workforce, plant, machinery, IT systems, semi-finished products, raw materials and socio-cultural management techniques) emerge as do its powers (e.g. to produce commodities and to generate profit). [30]

The following comments lend support for this ontology:

> [O]bjects have properties, and by virtue of having properties they are empowered to do things. The distinctions, where they can be made, are distinctions in language. Sometimes we pick out a property without highlighting any particular effects it can produce. In this case, we use a word like 'red', 'alive' or 'negatively charged'…By contrast when we use a power or disposition word, like 'strong', 'soluble, or 'repulsive', we identify a property (or set of properties) by pointing to specific kinds of things it empowers objects to do. Thus the question of whether every dispositional property or power is grounded in an occurent property makes no sense. There just are properties and all properties bring powers with them. [31]

> One possibility is that fundamental *things include some mixture of intrinsic powers and qualities.*[32]

> Bhaskar follows Harré & Madden in connecting generative mechanisms (and by extension causal laws and causality itself) to the behaviours of entities…For example, he writes 'reference to causal laws involves centrally reference to causal agents; that is, to things endowed with powers'. And even more to the point: 'only things and materials and people have powers'.[33]

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[30] Cartwright, 66, calls things like this 'nomological machines' which she describes as: 'a fixed (enough) arrangement of components, or factors, with stable (enough) capacities that in the right sort of stable (enough) environment will, with repeated operation, give rise to the kind of regular behaviour that we describe I our scientific laws'. Whilst I accept the concept of a nomological machine, I do not accept that laws require 'repeated operation' or deliver 'regular behaviour. Laws, for me, are the way of acting of powers, and powers act transfactually. Thus laws can be in operation without manifesting in anything, let alone event regularities.

[31] Cartwright, 74.

[32] Heil, 415, emphasis added.

[33] Groff, 98.

There is also the possibility of…a 'double aspect' theory…in which property identity depends on *both* hidden inner natures *and* the conferral of specific dispositions.[34]

A Reliant Scimitar GTE has the ability (is able, has the power) to do 125 mph., and this ability is explained in terms of its having six cylinders, a certain kind of fuel pump, etc – that is, in terms of the nature of a car…'Power', 'ability' and 'nature' are intimately interwoven and any effort to assign ontological priorities among them is…futile.[35]

Things and materials have powers…Indeed *the reason why we believe that a certain disposition can be asserted truly of a thing or material is that we think or indeed know that it currently has such and such powers*.[36]

To ascribe them [i.e. powers] is to offer schematic explanations, and in the growth of knowledge of the natures and constitutions of things the explanations are filled out… The nature of salt in virtue of which it has powers is that it is a cubical lattice of ions.[37]

Heil…thinks that the world is fundamentally made up of 'powerful qualities – a world that is neither one of naked powers, nor one that is purely quantitative...To deal with the problem I defend a compatibilist thesis. I say that a property can have a causal role without being a causal power, or being reducible to causal powers. For even the most fundamental causal powers in nature have dimensions. They may be located or distributed in space and time, have magnitude…and so on. But these dimensions of the powers are not themselves causal powers…Yet these dimensions of the powers clearly do have causal roles…These dimensions of the causal powers are the properties I call categorical…In reality, they are second order properties – properties of properties…The dimensions of the causal powers are not properties that things could have independently of the powers. They simply would not exist if the powers did not exist…For a dimensionless power would have to be one that had no directed law of action, no law of combination with other powers…and no law of action that refers to anything other than the events that are causally connected…But most powers are not dimensionless like this. For we do not live in a dimensionless world, and how things act and interact with each other depends on how they are distributed and orientated, and what powers and propensities they have.[38]

On the view of properties I want to propose, *while properties are typically not powers* of the sort ascribed by dispositional predicates, they are related to such powers in much the same way that such powers are related to the causal effects which they are powers to produce…Just as powers can be thought of as functions from circumstances to causal effects, so *the properties on which powers depend* can be thought of as a function from properties to powers…One might even say that properties are second order powers; they are powers to produce first order powers

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[34] Chakravatty, 398.
[35] Harré & Maddden, 11.
[36] Harré , 'Powers', 84, italics in original.
[37] Harré , *ibid*, 90.
[38] Ellis. 'Universals', 470. To claim that the dimensions of powers are not themselves causal powers, whilst also claiming that the dimensions of powers clearly do have causal roles seems to be trading on semantics. The properties of, let us say, being heavy, close to the ground, and of a similar colour to the ground I am walking on, endow this thing with the causal power to trip me up.

> (powers to produce certain sorts of events) if combined with other properties. But the formulation I shall mainly employ is this: *what makes a property the property it is, what determines its identity, is its potential for contributing to the powers of the things that have it.* This means…that if…properties X and Y make the same contribution to the power of the things that have them, X and Y are the same property.[39]
>
> There is no power which necessarily belongs to the things having this property [i.e. the property of being 'knife shaped']. But if this property is combined with the property of being made of steel, the object having these powers will necessarily have a number of powers…Thus for example, a knife shaped object has the power of cutting wood conditionally upon the possession of certain properties, let us say that this amounts to a *conditional* power.[40]
>
> [T]he identity of a property is determined by its causal potentialities, the contributions it is capable of making to the powers of things that have it. And the causal potentialities that are essential to a property correspond to the conditional powers that make up the cluster with which the property can be identified; for a property to have a causal potentiality is for it to be such that whatever has it has a certain conditional power.[41]

Unfortunately terminological ambiguity and lack of consistency often make it hard to know if this ontology is being supported or not. Let me exemplify this with comments from Shoemaker and Harré & Madden. Whilst the comments cited above from Shoemaker suggest support for ontology three, the following comment, also from him, suggests support for ontology one.

> Having introduced this notion of conditional powers, we can express my view by saying that properties are clusters of conditional powers. (I shall count powers *simpliciter* as a special case of powers). I have said that the identity of a property is determined by its causal potentialities, the contributions it is capable of making to the powers of things that have it. And the causal potentialities that are essential to a property correspond to the conditional powers that make up the cluster with which the property can be identified; for a property to have a causal potentiality is for it to be such that whatever has it has a certain conditional power.[42]

And the following comments suggests support both for ontology one, and ontology three:

> This account is intended to capture what is correct in the view that properties just are powers, or that properties are dispositional, whilst acknowledging the truth of the standard objection to that view, namely that a *things' powers or dispositions are distinct from, because 'grounded in', its intrinsic properties*.[43]

Whilst the comments cited above from Harré and Harré & Madden suggest support for ontology three, the following comment from Harré, *at least on first reading*, seems to reject ontology three.

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[39] Shoemaker, 232-4, emphasis added.
[40] Shoemaker, 234.
[41] Shoemaker, 235.
[42] Shoemaker, 235.
[43] Shoemaker, 235, emphasis added.

> To ascribe a power, to characterise by powers, is to open the question of the nature of things, without being obliged to answer it. The ultimates can be bare powers, indeed for the rational discourse they must be bare powers since to say that some thing or material is of an ultimate kind is to refuse, at least for the moment, to offer any account of its intrinsic nature….However, were we to operate still with the old idea of trying to characterise individuals and materials by their qualities [there will be a temptation to] fall back on a first substance theory.[44]

Comments on bare powers being ultimates, suggests thet Harré assigns some kind of ontologically priority to powers not things, thereby supporting interpretation one. And yet I cannot help thinking that the last quotation by Harré (and several other similar quotations in his work and in his work with Madden) is driven by a desire to avoid being forced to comment on the question of the nature of things. Harré wants to be able to say that powers imply things, but we often do not know much about these things, maybe we do not know their properties, and so we ought no to be obliged to answer questions about things or their properties. This, however, is an *epistemological*, not an *ontological* matter. Knowing little or nothing about things, and/or knowing little or nothing about their properties, does not mean things do not have properties. Whilst I think Harré's reluctance to commit to the nature of things and their properties is sensible, we have to be careful not to allow epistemology to eclipse an ontology of things, properties and powers.

Pause for reflection

In sum, then, things, properties and powers *emerge* simultaneously to form a unity. The moment a thing emerges from other things (with their own properties and powers), so too do its properties and powers. Things, properties and powers are emergent from, but irreducible to, other things, properties and powers. Things have properties, these properties *instantiate* transfactually acting powers, and this ensemble of things, properties and powers cause any events that might occur. I use the term 'instantiate' rather than 'cause' because to say properties *cause* powers takes us back to the idea of primacy rather than taking us forward to the idea that properties and powers form a unity. Powers are the way of acting of a things' properties; powers are a things' properties in action.

Some loose ends

Let me finish this section by tidying up loose ends. We have to be careful not to allow our language to mislead us into making ontological mistakes. Many things, properties and powers emerge to form a unity. When this happens, we often refer to this unity via one of its members. We might, for example, single out the 'thing' and use it to refer to a particular unity of things, properties and powers as (say) a 'bicycle'. Alternately, we might single out the 'power' and use it to refer to it as a 'means of transportation' – i.e. as a thing with the power to transport. We do not, typically, single out the 'property' and use it to refer to a bicycle as 'a red' (a red bicycle that is), or 'an extended in space' – although if such cases exist, perhaps in different languages, then it does not alter my point. And the point is, that referring to this unity in terms of one of its members is a *linguistic convenience*. It does not, however, mean the other two members have somehow vacated the scene. Only a bicycle with component properties such as wheels is a bicycle, and only when it has them, does it have the power to transport its rider from A to B. Things, properties and powers are necessary and sufficient for the existence of this unity. There cannot be things without properties and powers; there cannot be powers without the things that bear them and the properties that instantiate them; and there cannot be properties without powers and things.

[44] Harré, 98.

2. Dispositional properties, transfactuals and processes

When discussing things, properties and powers three other terms often crop up: *dispositional properties*, *transfactuals* and *processes.* Unfortunately, these terms are themselves often shrouded in ambiguity, which then makes the job of understanding powers that much harder. It is important, then, to disambiguate them also. The remainder of the paper is dedicated to this task.

Dispositional properties

The phrase 'dispositional properties' is widespread, and the term 'disposition' or 'dispositional' is usually used synonymously with the terms 'power' and 'powerful'. Consider some examples:

> I shall use the terms 'disposition', or 'dispositional property', and 'power' indiscriminately to refer to items of all these sorts.[45]
>
> Some properties are essentially dispositional…[but] 'being made of clay', or 'being hydrogen' seem to be respectable properties but are not obviously dispositional.[46]
>
> Henceforth I shall refer to the causal properties and dispositional features associated with a property as its 'powers'. Roughly, the powers of a property are the dispositions conferred on an object by possessing that property.[47]
>
> [C]ausal powers are the properties of concrete powerful particulars, which they possess in virtue of their natures.[48]

Whilst I think we should avoid this phrase, I want to register my awareness of a sense in which it is plausible. The plausibility of making statements about properties being dispositional or powerful is that they are statements to the effect that properties generate dispositions or powers; properties act dispositionally or powerfully; properties manifest themselves as dispositions or powers; things have properties and these properties manifest themselves as powers or dispositions or words to this effect. Indeed if it were not a tautology, we might write that the property of a power is that it acts dispositionally or powerfully. What Bird refers to as 'causal properties and dispositional features' are, for me, properties that instantiate powers. All this notwithstanding, the term 'dispositional properties' seems to invite ambiguity precisely because it takes dispositions (powers) *and* properties and then 'lumps' them together into a single phrase. Is a 'dispositional property' a *disposition* (power) or a *property*? Is a 'dispositional property' reducible to a disposition (power)? Is a 'dispositional property' reducible to a property? Or is 'dispositional property' something else? If we have an ontology of things, properties and powers, we do not need to court ambiguity by referring to 'dispositional properties'.[49]

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[45] Mackie, 'Dispositions', 362.
[46] Bird, 'Laws and Essences', 444.
[47] Bird, *ibid*, 444.
[48] Kaidesoja, 65.
[49] Incidentally, being committed to an ontology of things, properties and powers does not necessarily commit me either way vis-à-vis the dispositional versus categorical properties debate - although I have to say I agree with the following comment from Heil: 'Suppose we agree to think of our world as incorporating a mixture of categorical (qualitative) and dispositional properties. Which are which? Ellis offers shape as a paradigmatically qualitative property. But if shape is not-dispositional, how could we perceive objects and shapes? How could we have knowledge of a billiard ball's sphericity?...A ball rolls or would roll in virtue of its shape. A Rubik's cube looks or would look cubical because it is cubical. If sphericity and cubicity differentially affect the powers of their possessors, this might be thought to qualify them as dispositional. Indeed, it is hard to know what anyone could mean by describing

Transfactuals

The terms '*counterfactual'* and '*transfactual'* conditionals not only appear in the literature, they are central to much critical realist metaphysics.[50] Whilst they are sometimes treated synonymously in the literature,[51] they are most definitely *not* so treated by critical realists. Bhaskar uses the term 'normic' or normic conditionals to refer to *transfactual* conditionals, which are different from *counterfactual* conditionals. To fully grasp this distinction it is necessary to understand that powers can be thought of as constituting distinct moments in a causal chain.[52]

i) Powers are often said to be exercised, in operation, in play, endure without activity, lack motion, be dormant, be quiescent, be held in abeyance, be undynamized and so on. To reduce the ambiguity and inconsistency from having all these terms (and others) to refer to the same concept, I use the term 'exercise'.

ii) Powers are exercised without being said to be actualised, realized, fulfilled, manifest, in motion, or dynamised. Sometimes powers are exercised and, in addition, are also actualised, realized, fulfilled, manifest, acting, in motion, or dynamised. To reduce the ambiguity and inconsistency from having all these terms (and others) to refer to the same concept, I use the term 'actualise'.

This is better understood via an example of a thing in two distinct moments in a causal chain. Gibson asks us to picture: 'a power-station, a mechanism for generating electricity, which is not lying idle but is ticking over with its engines running ready to produce light when the switches are thrown'.[53] For Gibson, whilst there is clearly *something* going on in this power station, this 'something' is not electricity generation – although he lacks a concept to account for what this 'something' is. For Gibson, electricity generation only begins the moment the switches are thrown. What is lacking, here, is not only a concept of transfactually acting powers, but also a distinction between powers exercised and actualised. Having this distinction allows us to differentiate between a power-station which is ticking over with its engines running, and a power-station in which not only are the engines running, but the switches are thrown also. Of a power station that is ticking over with its engines running, we might say that it has the *exercised* power to generate electricity. Of a power station in which not only are the engines running, but the switches are also thrown, we might say it has the *actualised* power to generate electricity. The difference between the two moments is that in the second case the power is a step further along the causal chain vis-à-vis generating electricity – actually, there may be several moments, and/or the transition

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properties as powers beyond indicating that they differentially affect the powers of their possessors…Once you start thinking of properties in this way, it will be hard to come up with examples of genuine intrinsic properties of objects that are *not* powers' (Heil, 416). Even if all properties are dispositional, that is, even if all properties instantiate powers (as I prefer to put it), this does not mean that properties and dispositions or powers are the same thing.

[50] Bhaskar, 51n, borrows the term 'normic' from Scriven, although he seems less than keen on it. Unfortunately, however, the term derives from the Greek *nomos*, meaning law-like, and is associated with *nomological* which, in turn, is associated with the deductive-nomological model which is precisely what Bhaskar and other critical realists fundamentally object to. See the entry on 'counterfactual/transfactual' in Mervyn Hartwig, *Dictionary of Critical Realism*, (Routledge: London, 2007), 85.

[51] See for example, Bird, 'Laws and Essences', 439.

[52] I elaborate upon this in Steve Fleetwood, 'Powers and Tendencies Re-visited', *Journal of Critical Realism*, No. ? Vol. ? , (20?)

[53] Quentin Gibson, 'Tendencies', *Philosophy of Science*, No. 50, (1983), 296-308, 300.

between them may be discontinuous, but we can ignore this for the purposes of this paper. With this distinction between exercised and actualised powers understood, let us return to the distinction between *counterfactual* conditionals and *transfactual* conditionals.

Counterfactual conditionals state what might have occurred (but has not), had the antecedent been instantiated. The term 'counter' expresses the idea that we are dealing with something *counter, contrary* or *in opposition*, to the empirical fact. The antecedent has not been instantiated, so the consequent cannot manifest itself as an empirical fact.

Transfactual conditionals, by contrast, state what is actually occurring here and now, following the instantiation of the antecedent. But, and this is important, because the consequent may be unrealised, the consequent may not be an empirical fact. The term 'trans' expresses the idea that we are dealing with something that *spans* antecedent and empirical fact. The antecedent has been instantiated, the consequent has been exercised, but not actualised, and hence *not* manifested as an empirical fact.

With counterfactuals, the antecedents need not be instantiated; with transfactuals the antecedents must be instantiated, but the consequents need not be realised. To say that a power of a thing acts transfactually means: the thing's power is *exercised* but not *actualised*. This is recognised outside critical realist circles. Despite Chakravatty's use of the term 'disposition' instead of 'power' he does endorse the notion of transfactuality, writing:

> I explicitly adopt a realist account of dispositions: one according to which they are properly viewed as genuine, occurrent properties, regardless of whether any particular behavioural manifestations are realized.[54]
>
> [E]very case of warranted causal property attribution is facilitated by some property that is known independently of knowledge of its further effects…[T]here is nothing inconsistent in holding that perceptually direct properties are subject to CPIT, and yet apprehended without appealing to their effects.[55]
>
> Mechanisms generate phenomena, and may exist also when they aren't switched on or fail to deliver. They too must in many cases be distinct from the phenomena for which they are mechanisms.[56]

When powers act in open systems, which is most of the time in the social world, we are fairly sure that they act *transfactually*. The event or events that they have the powers to instantiate, may never actually be instantiated, the powers may remain unactualised, yet these powers remain in existence.

Processes

Ellis differentiates, ontologically, between objects, substances, materials (or things in my terminology), properties, events and *processes.*

> [E]ssences are the postulated intrinsic causes of the manifest *properties and behaviour* of the substances in question. Or, if we are dealing with natural kinds of

[54] Chakravatty, 398.
[55] Chakravatty, 394-5.
[56] Persson, 381.

> processes, then their essences are the intrinsic powers that are displayed in these processes.[57]
>
> Firstly, the existence of powers clearly entails the existence of natural kinds of processes. In particular, it implies the existence of at least some of those kinds of processes that are displays of these powers. Moreover, the powers in question are necessarily of the essence of these processes. [58]

Ellis offers an ontology consisting of the following components:

1. A *physical object* is anything that has energy, or consists of things that have energy.
2. A *physical event* is any change of energy distribution in the universe.
3. A *physical process* is any causally or inertially connected sequence of physical events.
4. A *physical property* is any real property, possession of which would make a difference to at least one kind of physical process involving that object.[59]

Let us clear up some matters that are straightforward. I agree with Ellis that there are 'objects', which I call 'things'. I also agree that there are events and properties, although I do not want to reduce them to *physical* properties because, as a social scientist, I am interested in *non-physical* properties and events such as gender and women being paid less than men for similar work. Where we start to disagree is over Ellis's lack of a separate category for powers, or dispositions - his favoured term for powers. This might, however, be because he treats powers as dispositional properties – a phrase I understand, but do not use because it courts ambiguity.

Now, when a thing is doing what it can do, a process is occurring which following Ellis we can define as: 'any causally or inertially connected sequence of events'. But what exactly is a 'causally or inertially connected sequence of events'? The notion of being *causally connected* implies that the acting power is the cause of the domino toppling. If a force acts on a domino and it topples, the sequence of events refers to event A (the power acting) and event B (the domino toppling). The notion of being *inertially connected* is less easy to understand. If we take inertia to be the resistance a thing has to a change in its state of motion, then the notion of being *inertially connected* implies something slightly different. There is still some kind of causal connection between the acting power and the domino's state, but there is no toppling because the domino resists the force. The sequence of events refers to the event A (the power acting) and event C (the domino resisting being toppled). Importantly, event C is still an event.

What makes this difficult to understand is that in the case of inertial connection, nothing seems to happen. Indeed, it just seems wrong to call the *non*-toppling of a domino an 'event'. Moreover, it is difficult to describe the connection between event A and event C as a 'sequence of events'. This is what misleads Gibson in his power-station example above. He worries that our phraseology 'gives the impression that *something is always going* on when often it is not'.[60] It is easy to think that when the domino topples, something has gone on, a sequence of events and, therefore, a process has occurred. It is far harder to think that when the domino does *not* topple, something has gone on, a sequence of events and, therefore, a process has occurred. The 'something going on' in the

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[57] Ellis, 'Universals', 467.
[58] Elis, 'Universals', 468.
[59] Brian Ellis, 'Physical Realism', *Ratio* No. XVIII, (2005), 371-384., 375.
[60] Gibson, 302, emphasis added.

first case is toppling; and in the second case it is resisting. But resisting is something, not nothing. What this misses, of course, is the concept of transfactuality. More accurately, it misses the possibility that a power can act transfactually, and a transfactually acting power causes a process even if nothing appears to happen.

The possibility that powers can act transfactually, that they can be exercised but unactualised, seems to capture Ellis's notion of processes as inertially connected sequences of events. Recall the domino example. If a power acts on a domino and it topples, the process, the sequence of events refers to event A (the power acting) and event B (the domino falling). The power to topple is exercised, actualised, and *factual.* If a power acts on a domino but there is no toppling, the process, the sequence of events, refers to event A and event C (the domino resisting). The power to topple is still exercised, but now is *un*actualised and *transfactual*. Note that it is the power that acts transfactually, not the process. A process, as a sequence of events, is the result of a transfactually acting power.

The difference here is between an empiricist conception of process and a (something like a) critical realist conception. For an empiricist, a process is an association between one observed event and another observed event or events. For a critical realist, a process is a relation between a transfactually acting power and its consequent. If the power is exercised *and* actualised, the event, domino toppling, occurs – there may or may not be an observer to witness this. If the power is exercised but *un*actualised, the event, domino resisting occurs - and even if there is an observer to witness this, the event of 'resisting' may be impossible to observe.[61] I suspect Ellis's notion of 'inertial connection' is close to the critical realist notion.[62]

Only if we accept that powers act transfactually is Ellis correct to state that 'the existence of powers clearly entails the existence of…processes. In particular, it implies the existence of at least some of those kinds of processes that are displays of these powers'.[63] Transfactually acting powers (in open systems) can exist exercised, but unactualised. And even unactualised powers can result in processes, as displays of these powers, as sequences of events.

It may also be the case that Ellis is mistaken in trying to differentiate between things and processes *in the manner he does.* Stripping his claims down to their essentials he argues:

i) The essences of a *thing* are the intrinsic causes of its manifest (properties and) behaviour.

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[61] This takes us into ideas of 'in-principle observability and un-observability' and I cannot elaborate here.
[62] I am not quite sure whether to interpret Ossorio's (156) comments on processes as empirical realist, or critical realist. A process, he claims, 'is never completely present at a given time, since at any time all or most of the process will be in the past or future', adding that a 'process is not the process it is until it is complete'. Ossario tells us that if his trip from Madrid to Salamanca (a process) is interrupted by an accident and he returns to Madrid, then whilst *a* process still occurred, it was not *the* original process. But what if his trip to Salamanca is delayed by an accident in the form of a broken down bus? I would say that when he is in a hotel room waiting for the bus the next day, he is still engaged in a process of travelling to Salamanca. I would say that there is a process going on because there is a transfactual power exercised, but not actualised due to a countervailing power. Without powers in his ontology, however, Ossario cannot say this and instead would have to say something like there is a process going on because there is a sequence of events going – i.e. leaving Madrid and arriving in Salamanca. This seems close to Ellis's initial notion where a process is going on if there is a sequence of events going on, such as event A (the power acting) and event B (the domino toppling). Defining a process in terms of a sequence of events (a start and a finish) seems to me to border on empirical realism.
[63] Ellis, 'Universals', 468.

ii) The essences of a *process* are the intrinsic *powers* that are manifest (displayed) in these processes.

If I understand him correctly, and this is not easy to understand, he appears to be suggesting that *things* are associated with *behaviour* (events); and *powers* are associated with *processes* (more events, as sequences). Apart from the mistake of treating properties and behaviour synonymously (as in i), and apart from the fact that manifest behaviour (events) and processes (sequences of events) appear in both (i) an (ii) when Ellis is trying to differentiate them, there is another problem. It is not that things manifest in behaviour, and powers manifest in processes. Rather, it is that *things, their properties and their powers, often manifest in processes*. Things, processes and powers are all necessary for processes to occur.

Conclusion

By reducing terminological ambiguity and inconsistency, this paper has uncovered, and defended, an ontological commitment to the simultaneous emergence of things, properties and powers that form a unity. The moment a thing emerges from other things, (with their properties and powers) so too do its properties and powers. Things, properties and powers are emergent from, but irreducible to, other things, properties and powers. Things have properties, these properties instantiate (transfactually acting) powers, and these powers, when exercised and actualised, can cause events and processes. In short, we now have a far less ambiguous concept of powers, firmly anchored in an ontology of things, properties and powers. But what of the close relative of powers, namely 'tendencies'?

Despite the fact that a very important term I have said nothing about tendencies in this paper. This is a serious omission because the terms 'powers' and 'tendencies' are used widely by critical realists. Bhaskar, for example, claims that 'powers must be seen as tendencies'.[64] In places he refer to 'a tendency as a power' and then goes on to make qualifications about the powers (i.e. they 'may be exercised without being fulfilled or actualised',[65] or they are 'held in abeyance'[66] or some such), whilst in other places he suggests that 'powers are more than tendencies'.[67] The fact is, however, critical realists use these terms rather ambiguously and inconsistently. Now that we have a far less ambiguous concept of powers, we are in a stronger position to consider the relation between powers and tendencies. This is a theme I will return to in a paper due to appear in the following issue of the *Journal of Critical Realism*.

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[64] Bhaskar, 231.
[65] Bhaskar, 50.
[66] Bhaskar, 235.
[67] Bhaskar, 230.

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