

Strong Emergence and Alexander's Dictum

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Abstract

Emergentists hold that higher-level phenomena are something 'over and above' the sum of their most basic parts. Typically, this involves the claim that emergent phenomena are both *distinct from* and *novel with respect to* the base phenomena from which they emerge, whilst nevertheless being dependent upon the base phenomena. A popular way to characterise *strong metaphysical emergence* is to hold that emergent entities must possess *novel causal powers*. Underlying this trend is a commitment to 'Alexander's Dictum', which can be roughly glossed as the claim that to exist is to have causal powers. Alexander's Dictum, however, does not enjoy universal assent. Nor is it clear exactly how the rough gloss of the principle ought to be finessed. This paper examines the role the principle plays in the debate between emergentists and reductionists; the motivations for endorsing it; criticisms which it faces, and responses to these criticisms. It argues that whilst these criticisms may show that Alexander's Dictum cannot be endorsed as a fully general principle, nevertheless, it can be formulated in manner that makes it suitable for use in the emergence debate. Finally, some wider consequences of giving causal powers a central role in the debate between emergentists and reductionists are examined.

1. Introduction

Emergentists hold that higher-level phenomena are something 'over and above' the sum of their most basic parts. This usually involves the emergent phenomena being taken to be both *distinct from* and *novel with respect to* the base phenomena from which they emerge, whilst nevertheless being dependent upon the base

phenomena. How *distinctness* and *novelty* should be understood depends on the kind of emergence being proposed: epistemically emergent higher-level phenomena are indispensable features of certain explanatory or predictive practices; whereas with metaphysically emergent phenomena their ‘over and above-ness’ is a matter of ontology. This division of kinds of emergence into epistemic and metaphysical is neither exhaustive nor maximally specific, but it should be sufficient for the purposes of this paper. For those interested in a more nuanced division, there has been a lot of recent work on varieties of emergence, see for instance: Chalmers, 2006; Silberstein, 2001; van Gulick, 2001; Wilson, 2015.

One popular way to characterise a strong form of metaphysical emergence is to say that emergent entities must possess *novel causal powers*. For instance, Jaegwon Kim asserts that if emergentism is to be a coherent position, then emergent entities must have distinctive causal powers (1999). Timothy O'Connor and Hong Yu Wong characterise emergent properties as basic properties had by composite entities; where 'basicness' is at least in part a matter of conferring novel causal powers (2005). Jessica Wilson takes strongly metaphysically emergent entities to have “fundamentally novel powers” (2015, p.356). There isn't space in this paper to address these various accounts in detail, but it should be clear that characterising a strong form of metaphysical emergence in terms of novel causal powers is a common feature of the current literature.

One strand of thought which underlies this trend is a commitment to ‘Alexander's dictum’ (also sometimes called the ‘Eleatic Principle’ or the ‘Causal Criterion’). Alexander's Dictum is typically roughly glossed as follows (see for instance Cargile, 2003, p.1):

AD: To exist is to have causal powers

Adherents of **AD** thus hold that we ought to allow into our ontology only those entities which are capable of engaging causally with other entities, which can make a difference to what happens in the world. The above formulation is loose and sloganistic, and one of the aims of this paper is to offer some clarification on how the principle ought to be interpreted—presenting such criteria in this sloganistic manner is somewhat commonplace. Compare the above, for instance, with the Quine’s “to be is to be the value of a variable” (e.g., 1980, p.15).

If **AD** is true then the motivation for outlining metaphysical emergence in causal terms should be clear: the senses of *distinctness* and *novelty* which really matter in formulating metaphysical emergence will be those which refer to causal powers: it is by possessing or conferring *distinct, novel* causal powers that emergent entities gain ontic status, and from which this form of emergentism gains its metaphysical ‘strength’. It might initially seem that accepting something like **AD** might automatically commit one to accepting the contentious claim that causal powers are real, irreducible features of the world. This is not, however, the case: those who take a broadly anti-realist stance on powers—as many neo-Humean metaphysicians do—can simply read the term ‘causal power’ as shorthand for whatever they think properly analyses or reduces this concept, be that the truth of certain conditional statements (see, for instance, Lewis, 1997) or the possession of certain non-dispositional, categorical bases (see, for instance, Prior, Pargetter and Jackson, 1982).

AD, however, does not enjoy universal assent. Nor is it clear exactly how the rough gloss of the principle given above ought to be finessed. This paper examines the role **AD** plays in the debate between emergentists and reductionists; the motivations for endorsing **AD**, and some criticisms which **AD** faces, as well as some responses to these criticisms. It argues that whilst these criticisms might be taken to show that **AD** cannot be endorsed as a fully general principle of ontological commitment, nevertheless, the principle can be

formulated in manner that makes it suitable for use in the emergence debate. Finally, some wider consequences of giving causal powers a central role in the debate between emergentists and reductionists are examined.

2. Alexander's Dictum

In *Space, Time and Deity*, British emergentist Samuel Alexander writes of epiphenomenalism—the view the mental states do not cause anything—that:

“The doctrine is not simply to be rejected because it supposes something to exist in nature which has nothing to do, no purpose to serve, a species of noblesse which depends on the work of its inferiors, but is kept for show and might as well, and undoubtedly would in time be abolished.”
(Alexander, S, 1920, p.8)

Alexander goes on to suggest that the strongest grounds for the rejection of epiphenomenalism are in fact empirical. Whilst the details of his claim need not detain us here, the passage quoted above is suggestive of a general principle concerning ontology: in order for some posited entity to be admitted to an ontological system, that entity ought to play some distinctive role or serve some distinctive purpose in that system, one that is distinctive in the sense that that role or purpose is not played or served by some more basic or fundamental entity or entities—Alexander's 'inferiors'. If the entity cannot be given any such role, then it ought to be abolished in favour of the more basic or fundamental entity or entities which in fact play that role or serve that purpose.

Alexander was certainly not the first to suggest this line of thought, which goes back to antiquity. In the *Sophist*, Plato's Eleatic Stranger, when discussing the nature of being, says:

"I suggest that everything which possesses any power of any kind, either to produce a change in anything of any nature or to be affected even in the

least degree by the slightest cause, though it be only on one occasion, has real existence. For I set up as a definition which defines being, that it is nothing else but power." (*Soph.* 247d-e)

The Eleatic Stranger identifies real existence with the potential to engage in causal interactions. This implies that those putative entities which cannot engage in such interactions, that are neither causes nor effects, lack real existence. They ought not to be included in our ontology, which should only contain entities which *do* have the potential to be changed, as effects, or to produce change, as causes.

This leads us to something like **AD**, the claim that to exist is to have causal powers. At this point, it is worth reflecting on a couple of general points concerning this principle. First, it should be noted that whilst being committed to **AD** may often go hand in hand with the acceptance of views such as dispositional essentialism or a powers account of properties—a family of views which may very roughly be characterised as holding that properties are essentially causal in nature, and do not derive their causal relevance from, for instance, laws of nature—it is perfectly consistent to accept **AD** even if one rejects these views. David Armstrong rejects the powers account of properties (see, for instance, 1996, ch.5), but is an advocate of **AD** (1978; 1989).

Second, for the purposes of the investigation at hand, **AD** should properly be understood as providing a *criterion of ontological commitment*—that is, a methodological philosophical principle that provides a standard by which to adjudicate which putative entities we take a realist attitude towards. A stronger reading of **AD** is possible; one which *equates* existence with the possession of causal power—this sort of reading is perhaps suggested by the passage from the *Sophist* quoted above.

Third, the term 'have' as it appears in **AD** must be read in a fairly loose sense if the principle is to be generally applicable to entities of a variety of

different ontological categories. An object, for instance, might 'have' a power in virtue of possessing a particular property, but arguably a property will not 'have' a power in virtue of possessing some further property. Rather, depending on one's views concerning the relationship between properties and causation, the property will 'have' a power, say, in virtue of its essential nature, or because it falls under some law, and will *confer* this power on objects by which the property in question is instantiated. That properties do not literally *have* powers, however, should not be taken to mean that, according to **AD** they therefore do not exist, and thus that nominalism is true. Thus, it is crucial that **AD** be read loosely enough that it can apply to properties, objects and perhaps also to entities belonging to other ontological categories, such as events and processes.

3. Emergence, Reduction and Alexander's Dictum

Having briefly outlined the nature and origins of **AD**, it is worth spending a little time thinking about the role the principle has come to play in the debate between emergentists and reductionists. There are two distinct intellectual directions from which one can approach this issue. First, prior to considering the debate between emergentists and reductionists, one might have an antecedent commitment to **AD**. Coming at the issue from this direction, it would seem only natural to apply the principle within the debate. On the other hand, one's primary concern might be with the debate, prior to one having any particular commitment to **AD**. Coming at issue from this direction, however, raises the question of why one ought to adopt this particular criterion and accompanying characterisation of metaphysically emergent entities as being those higher-level entities which possess or confer novel causal powers.

There are a number of compelling reasons to adopt **AD** within the emergence debate, and thus to frame strong metaphysical emergence in terms of

the possession of distinct, novel causal powers. First, **AD** seems to provide at least a sufficient criterion of existence. Suppose, for sake of argument, that E is a higher-level object which is dependent on some set of lower level objects, the Bs, but which possesses causal powers which are genuinely distinct from and novel with respect to the causal powers possessed by the Bs. Remember that the issue at stake, in terms of strong metaphysical emergence, is whether there exist any higher level entities which are properly characterised as 'over-and-above' the lower level entities upon which they depend. E's having its own causal efficacy which cannot be attributed to the Bs looks like evidence *par excellence* that E is something over and above the Bs; that E ought to be accorded genuine irreducible ontological status. If it were not, then it seems that there would be no entity to which to attribute this causal efficacy, and this seems absurd.

Second, having a distinctive causal role seems the appropriate criterion for picking out *strong* forms of metaphysical emergence. There might well be reasons to hold that some higher level entity E is metaphysically, and not just epistemically, emergent from the Bs even if E does not have distinct, novel causal powers. That is to say, whilst we have seen already that **AD** provides a sufficient condition for metaphysical emergence, it is at least *prima facie* conceivable that it does not provide a necessary condition. Suppose this is the case, and that there could be grounds for thinking that some higher-level entity E₁ was in some sense metaphysically, and not merely epistemically—that is, merely with regards to explanatory or predictive practices—distinct from and novel with regard to the lower-level entities, the Bs, upon which it depends. E₁ might well count as metaphysically emergent, then. But compare E₁ to a higher-level entity E₂ which *does* have its own novel causal powers—it seems very natural to see the latter as emergent in a *stronger* sense than the former. This kind of distinction between strong and weak metaphysical emergence can be found, for instance, in Wilson, 2015.

Finally, to the extent to which one has confidence in science's ability to trace causal goings-on, adopting **AD** promises to help make the debate between emergentists and reductionists empirically tractable—at least in part. This is something that all parties to the debate ought to agree is desirable. For arguments in favour of the claim that one of the central roles of science, especially the physical sciences, is to trace causal goings-on, see for instance, Blackburn, 1990 or Hawthorne, 2001.

It is also worth noting that adopting **AD** will not only be attractive to emergentists, as its combination with various forms of causal exclusion argument (see e.g. Kim, 1999) provides a clear framework and procedure for reductionism (this point is nicely elaborated in Elder, 2003). Having a criterion of ontological commitment that both emergentists and reductionists can agree upon is crucial for the debate. If Smith is an emergentist concerning entities in some domain, but Jones is reductionist about them, and Smith and Jones subscribe to differing criteria of ontological commitment, then there is a very strong chance that there is only the appearance of genuine disagreement between them—Smith and Jones may well simply be talking past one another, as those entities count as real according to Smith's criterion but not according to Jones's. The form of reduction that stems from the acceptance of **AD** might also be thought attractive because it is clear to see how it can be distinguished from eliminativism—if E reduces to the Bs, as all of E's causal powers can be identified with causal powers of the Bs, then E still *exists* according to **AD**—we have just been ascribing causal powers to E! E does not, however, exist as *distinct from or novel with respect to* the Bs: E is nothing *over and above* the Bs.

Adopting **AD** thus gives a clear sense of what both strong metaphysical emergence and the relevant form of reduction would consist in; provides a clear and robust conceptual framework in which to situate the debate, and may help make the debate empirically tractable. These considerations suggest that, if **AD**

can be suitably motivated, finessed and defended from the criticisms that have been raised against it, then its adoption in the debate—already widespread in the literature, as noted above—is both desirable and justifiable.

4. Arguments in favour of Alexander's Dictum

We have seen that there are reasons in favour of employing **AD** in the debate between emergentists and reductionists. It is now time to examine some of the arguments that have been put forward in support of the principle independently of any role that the principle might play in the debate between emergentists and reductionists.

Some arguments in support of **AD** appeal to epistemological concerns. For instance, talking of properties in *A Theory of Universals*, Armstrong argues as follows:

"...every property bestows some active and/or passive power upon the particulars which it is a property of... it seems possible to conceive of a property of a thing which bestows neither active nor passive power of any sort. But if there are any such properties, then we can have absolutely no reason to suspect their existence. For it is only in so far as properties bestow powers that they can be detected by the sensory apparatus or other mental faculty." (1978, pp. 44-45)

Armstrong's central point is that in order for an entity—it is worth noting at this juncture that whilst Armstrong is discussing properties specifically, the point can be extended to other sorts of entity too—to make itself known to us, be that through featuring directly in sense-perception or less directly by registering on a measuring instrument of some sort, it must be endowed with some sort of causal power. If it were not, then it could not affect our sense organs or our measuring devices, for it would lack the powers necessary to so do. Even if causally inert entities are logically possible, there cannot, of necessity, be any empirical evidence for their existence. And on this basis, suggests Armstrong, we should

refrain from supposing that there are any such entities. This argument moves from an epistemic claim—that we could never have evidence of causally inert entities—to a metaphysical one, that we should exclude such entities from our ontology.

Colyvan (1998) identifies a potential inductive argument in favour of **AD**. The argument begins with the claim that there is an intuitively plausible account of where the divide between real and fictional/instrumental entities ought to lie: which will “include physical objects, including theoretical entities, perhaps fields and hence waves as disturbances in these fields, amongst the real entities, but should not include (concrete) possible worlds and frictionless planes” (ibid., p.3). It can then be noted that the intuitively real entities are all entities which possess causal powers and engage in causal interactions (in the actual world). The intuitively non-real entities, on the other hand, seem to lack this feature. This observation can then be used as an intuitive inductive basis for the plausibility of something like **AD**.

A third form of argument for **AD**, which, like the first, has been put forward by Armstrong, is explanatory in nature. It begins by considering the question of the existence of abstracta—entities that exist outside of space and time, and which can be contrasted with concreta, entities that exist within space and time. Suppose, for the sake of argument, that there are real abstract entities—numbers, say, or propositions. We can then ask whether or not these abstract entities engage in causal transactions with particular, concrete entities. If they do, Armstrong notes that this will be an exceptional form of causation—abstracta are typically taken to be unchanging, for they exist outside of time, and change seems to require at the very least temporal succession (1978, p.129). Nevertheless, if we can accept this form of causation, then real abstract entities pose no challenge to **AD**. If, however, we answer the question in the negative, but

nevertheless maintain the existence of abstracta, then **AD** seems to be faced with a counter-example.

However, it is open to the proponent of **AD** to question what grounds we have to take a realistic attitude towards abstracta. Abstract entities are, by their nature, not observable—neither directly through the senses nor via scientific instruments. But the realist is typically happy to countenance, alongside observables, unobservable entities that play the right sort of *explanatory* role. However, Armstrong argues that in the case of abstracta, the prospects on this front are dim, if, as in the case currently under consideration they are taken to lack causal power completely:

“But if the entities postulated lie beyond our world, and in addition have no causal or nomic connections with it, then the postulation has no explanatory value. Hence (a further step of course) we ought to deny the existence of such entities.” (Armstrong, 1989, p.7-8).

Armstrong’s key claim is that if abstracta lacking causal power thus also lack explanatory credentials, then we ought not to take a realist attitude towards them. Thus, the putative counterexample to **AD** is undermined.

The three arguments briefly outlined above are all taken to support something like **AD**. There are objections that can be raised to each argument—see Colyvan (1998) for details—but these shall not be subjected to scrutiny here. Instead, the next section shall focus on criticisms which seek to challenge **AD** directly, rather than those which seek to undermine the thesis by weakening the arguments put forward in its favour.

5. Criticisms of Alexander’s Dictum

For a criterion of ontological commitment to be successful, it ought to be neither too narrow, nor too broad. A criterion that was too narrow would fail to count as existent some entity or entities that we have independent, compelling reasons to consider to genuinely exist. A criterion that was too broad would count as existent some putative entity or entities that we have independent, compelling reasons to consider *not* to genuinely exist. **AD** faces criticisms from both directions: some have found the criterion it provides so broad as to be totally uninformative, whilst others have held that there are plausible counter-examples to the principle in the form of entities that we have to good reason to think exist, but which nevertheless lack causal powers. The trick for a successful criterion is to meet what one might think of as *Goldilocks' standard*—not too hot, not too cold, but *just right!* This section will outline these criticisms, and in section six it is argued that there are plausible modifications to **AD** which allow it to meet these objections—at least insofar as it is employed in the debate between emergentists and reductionists.

Cargile complains that **AD** “...is not useful because having causal power can be stretched so broadly that its coincidence with existence is trivial” (2003, p.144). The worry runs something like this: Cargile invites us to consider the disagreement between a dualist and an eliminative physicalist of some stripe concerning the reality of mental images—the former holding that there really are such things; the latter denying that there are. The dualist might make an appeal along the following lines: a particular instance of a particular mental image might occur as the effect of a thinker being asked a certain question, and might itself be the cause of some further mental event—say a recollection that the thinker associates with the image.

Prima facie, it seems, it is possible to ascribe causal powers to mental images. But, mental images could only ever be candidates for the ascription of causal powers if one has an antecedent reason to believe them to be existent

things—as non-entities cannot be the bearers of causal powers (*ibid.*). It seems like the dualist may be in danger of begging the question here. The eliminative physicalist may resist further by claiming that the *prima facie* plausibility of ascribing causal powers to mental images can be overturned by appealing to some relevant restriction on the notion of causal power—thus, **AD** will rule in their favour. Again, Cargile argues, we are entering question begging territory: it is highly likely that any restriction which is strong enough to do the work the physicalist requires it to do will itself presuppose in some way the truth of physicalism. If Cargile is right, then appeal to something like **AD** is of no use in settling the ontological dispute concerning the existence of mental images.

The core worry Cargile raises is that, whilst it might in fact be true that all and only those entities that really exist are bearers of causal powers, and so **AD** is not false, the criterion cannot fulfil any useful philosophical role: we cannot appeal to **AD** to adjudicate, for instance, between our imaginary dualist and physicalist. It is only when we have independent grounds for taking something to exist that we can ascribe causal powers to it, and it is illegitimate to restrict the notion of causation in such a way that it can be used to discriminate between the existent and the non-existent. This is a problem that will generalise: Cargile spends much of the rest of the paper arguing that similar issues arise, for instance, concerning the existence of abstract entities. Similar thoughts are echoed by Elder, who says of **AD** that it is “...so bland as to be scarcely worth stating” (2003, p.170).

Another form of objection claims that there are some putative entities which both lack causal powers and plausibly exist, and **AD** fails to accommodate their existence. If this is correct, then **AD** cannot provide a satisfactory criterion of ontological commitment. The rest of this section will outline two potential counter-examples to **AD**: abstract objects and epiphenomenal properties.

Consider the following claim: abstracta such as numbers, sets and propositions are not in any way integrated into the causal network of the world—nothing caused them to exist; nothing has ever or will ever cause them to cease to exist or to change in any other way, and they themselves do not cause anything whatsoever. Given that causation is often considered to be a spatio-temporal phenomenon, and that abstracta are by definition non-spatio-temporal, this claim enjoys a high-degree of plausibility—although, as we have seen above, it may be disputed. Suppose, for the sake of argument, that the claim is true, and that, therefore, abstracta such as numbers, sets and propositions lack causal powers completely. If this is the case, and if **AD** provides a satisfactory criterion of ontological commitment, then it follows that we ought to embrace nominalism and reject the existence of abstracta.

However, there are independent arguments that support Platonism, the view that at least some abstract entities exist. Most commonly attributed to Quine and Putnam—separately—the 'indispensability argument' proceeds from the claims that (i) we ought to take a realist stance towards those entities over which our best theories seem to quantify and (ii) that our best theories seem to quantify over numbers to the conclusion that we ought to be ontologically committed to numbers, and therefore, to at least some abstract entities (see, for instance, Putnam 1979 or Quine 1980; 1981). More recently, shifting the focus from quantification, Colyvan has argued—*contra* Armstrong—that abstract entities play an indispensable explanatory role in many of our best theories, and, on this basis, ought to be considered to genuinely exist (2001). The foregoing is only the roughest outline of such an argument, but it ought to be sufficient for our purposes here. If there are good reasons to believe that abstracta exist, even though they lack causal power, then on pain of counter-example **AD** cannot provide a satisfactory criterion of ontological commitment. See Colyvan (1998);

Marcus (2015), and Oddie (1981) for further discussion of **AD** and abstract objects.

Another class of potential counter-example to **AD** are epiphenomenal properties. Epiphenomenal properties are non-causal properties, properties which do not bestow their bearers with any causal powers. If we have good reason to think that at least some epiphenomenal properties really exist, then it appears that **AD** ought to be rejected. Epiphenomenalism has been most popularly appealed to as a form of property dualism about the mental—classic arguments such as the conceivability (see, for instance, Chalmers, 1996, ch.4) and knowledge (see for instance Jackson, 1982) arguments suggest that those properties responsible for the intrinsic, phenomenal nature of experiential states are genuinely distinct from any underlying physical basis they may have, but nevertheless make no causal difference whatsoever. If there are good reasons to believe that such properties exist, even though they bestow their bearers with no causal powers whatsoever, then on pain of counter-example **AD** cannot provide a satisfactory criterion of ontological commitment. For an in-depth discussion of epiphenomena and **AD** see Sabates (2003).

AD faces challenges on two fronts: first, that it is not sufficiently precise as to be a useful or informative principle that can be deployed in order to help settle ontological disputes; and second, that it incorrectly classes as non-existent certain kinds of entity that we have good reason to take seriously, ontologically speaking. In the next section, we shall see that **AD** can be amended such that it can avoid these worries and be suitable for use in the debate between emergentists and reductionists, although this comes at the price of general applicability.

6. Formulating a satisfactory version of Alexander's Dictum (for the purposes of the emergence-reduction debate, anyway...)

Consider first the challenge posed to **AD** by abstract entities. There is a simple modification to the principle which can avoid any concerns raised by those who hold that we have independent, compelling grounds to believe that abstracta genuinely exists, namely:

AD-1: For concrete entities, to exist is to have causal powers.

Adopting **AD-1** as opposed to **AD** comes at the cost of generality—**AD-1** does not provide a universal criterion of ontological commitment, but is restricted to a particular ontological regime: the spatio-temporal. Is this a cost that participants in the debate concerning emergence and reduction can happily incur? If the only reason that participants in the debate had for adopting something like **AD** was that principle's claim to being a fully general, universal criterion of ontological commitment, then this would be a serious problem. However, as has already been shown in section three, this is not the case: there are a number of compelling reasons for both emergentists and reductionists to accept something like **AD**, and so **AD-1** is not undermined—at least in its application to the relevant debates—by being less-than-fully general.

Another way in which **AD-1**'s restricted applicability could be problematic would be if emergentists and reductionists were specifically engaged in debate concerning the ontological status of abstract objects. Typically, however, this is not the case: what it is at stake in the debate is, for instance, whether there are emergent condensed- or soft-matter systems (see, for instance, Lancaster and Pexton, 2015 or McLeish, forthcoming); whether chemistry is emergent from physics (see, for instance, Hendry, 2017); whether the

mind or self exists over and above the body (see, for instance, Hasker, 1999) and so on. All these debates concern the ontological status of higher-level *concrete* entities, not abstracta. Thus, for the purposes of the debate between emergentists and reductionists, the restricted scope of **AD-1** is perfectly acceptable.

The concern that **AD** (and equally, **AD-1**) is too broad—almost trivial—can, with a further amendment to the principle, also be met. The core worry here is that the notion ‘causal power’ is so broad that it can be applied very liberally, and that any proposed restriction on the notion will ultimately beg the question against the existence of the class of entities whose existence it is introduced to exclude. In order to meet this worry, **AD-1** should be amended as follows:

AD-2: For concrete entities, to exist is to have irreducible, non-redundant causal powers.

Unlike **AD**, **AD-2**—which is very close to something proposed by Merricks (2001, p.115)—can be appealed to in order to adjudicate between debates such as the one Cargile outlines between the dualist and eliminative physicalist concerning the reality of mental images. Whilst the concept of causal power may, in general, be as broadly applicable as Cargile suggests, the concept of irreducible, non-redundant causal power is not. Furthermore, restricting the criterion of ontological commitment to irreducible, non-redundant causal powers does not beg the question in favour of either party: it remains an open question whether or not mental images, for instance, are possessed of irreducible, non-redundant causal powers. **AD-2** therefore avoids the charge of being so broad as to be metaphysically uninformative.

In section two it was stated that one of the advantages of adopting something like **AD** in the debate between emergentists and reductionist was that it provides grounds for distinguishing between reductionism and eliminativism. Adopting **AD-2**, however, will rob the principle of this advantage, for if only

those entities which have irreducible, non-redundant powers exist, then a putative higher-level entity E possessed only of *reducible, redundant* powers will not simply be reduced to the Bs upon which it depends—it will be eliminated in favour of them. Thus, in order to maintain this advantage, our principle needs to be complicated a little further:

AD-3: For concrete entities, to exist is to have causal powers; to be a fundamental existent is to have irreducible, non-redundant causal powers.

Unlike **AD-2**, **AD-3** allows that higher-level entities which lack irreducible, non-redundant causal powers exist, but only non-fundamentally. One consequence of **AD-3** might strike some readers as odd. In characterising strong emergence at the outset of this paper, we said that strongly emergent entities are *dependent* entities, and it is natural to some to think of fundamentality as a matter of *independence*. Thus, **AD-3** runs the risk of mis-characterising strongly emergent entities. However, the notions of fundamentality and independence ought not to be run together in this way—to see why this is the case, consider the fact that there doesn't seem to be any contradiction in the following two claims: (i) *properties* as an ontological kind are dependent on the substances by which they are instantiated; and (ii) there are some fundamental properties. These claims may of course be false, but they do not seem to be contradictory—for more developed arguments on the conceptual separation of fundamentality and independence, see Barnes (2013).

We have seen that **AD** can be finessed such as to accommodate the concern that it is too broad and to avoid the challenge posed by abstract entities. The final objection outlined in the previous section was that epiphenomenal properties are a potential counter-example to **AD**. The proponent of **AD** can respond to this challenge in (at least) two ways. First, echoing the claims made by Cargile and Elder, one could hold that the sense of 'causal power' employed in

the first clause of **AD-3** can be taken to be so broad that even epiphenomenal properties can be ascribed causal powers, albeit reducible, redundant causal powers. It might be objected that this move is illegitimate, as epiphenomena are meant to lack such powers *by definition*. It isn't clear, however, that this complaint is appropriate. Plausibly, what it is crucial to maintain concerning the causal status of epiphenomena is that they *make no causal contribution*, that the causal run-of-things would be not be affected in the slightest by their absence. *This* could certainly be the case whether or not one ascribed epiphenomena causal powers in this very liberal sense. Secondly, taking one's lead from Plato's Eleatic Stranger, one could hold that so long as epiphenomena have what are sometimes called 'backwards facing' causal powers—that is to say, as long as they can be *caused* to exist, even if they never then go on to cause anything themselves—then this will be sufficient for satisfying the first clause of **AD-3**, and the putative counter-example can be accommodated.

Whilst, in a simple form and as a fully general criterion of ontological commitment, **AD** faces serious challenges, it can be finessed—for instance, as **AD-3**, although there are almost certainly other available glosses—such as to make its deployment in the debate concerning strong metaphysical emergence both appealing and justifiable. The arguments in this section have taken these challenges seriously, and assumed that the notion of 'causal power' can be stretched as broadly as Cargile and Elder suggest and that there are compelling, independent reasons to think that abstracta and epiphenomena exist. There is, of course, another general strategy of response available to the proponent of **AD**, which is to argue, for instance, that the indispensability argument, or the arguments in favour of epiphenomenal dualism, are not sufficiently strong to motivate these putative counter-examples. To do so, however, would involve taking stances on a variety of issues in meta-ontology; philosophy of science; philosophy of mathematics and philosophy of mind.

7. Wider Consequences

Taking strong metaphysical emergence to be a matter of possessing or conferring distinctive, novel causal powers is widespread in the debate. In part, this is due to a more or less explicit commitment to Alexander's Dictum, which has remained largely unexamined. The preceding sections have examined this principle in more depth; detailed the role it plays in the debate between emergentists and reductionists; outlined arguments for and against the principle as a general criterion of ontological commitment and argued that a finessed version of the principle is available which (i) meets major objections and (ii) is suitable for use in the debate concerning strong metaphysical emergence. One consequence of adopting a finessed version of **AD** such as **AD-3** in this debate is that it puts questions concerning the nature of (irreducible, non-redundant) causal powers centre stage.

Such questions include, but probably aren't limited to: how and when simple powers might combine to form complex powers; whether powers are single- or multi-track—that is, whether each power has only one manifestation type, or whether a single power can be directed towards a number of distinct manifestations— and *how* powers operate, whether a lone power manifests when triggered by the presence of a suitable stimulus, or whether powers operate mutually such that several powers must 'work together' to bring about a particular manifestation. That questions concerning strong emergence may well be crucially sensitive to questions in the metaphysics of powers is something that has been largely overlooked in the current literature. Plausibly, implicitly assuming certain answers to the questions outlined above may prejudice the debate, in some cases in favour of the reductionist, in others in favour of the emergentist. This means that for the debate to continue in good order, it is

essential that these potential prejudices are made explicit and open for assessment. These points are argued in much more detail in Carruth (forthcoming).

8. Conclusion

Alexander's Dictum provides an attractive standard by which to assess putative cases of reduction or emergence: it sets a standard which both parties in the debate can accept; makes clear the sense in which putative strongly emergent entities are supposed to be something 'over and above' the more basic entities from which they emerge, and promises to help the debate maintain some empirical tractability. It has been argued that the principle can be formulated in such a way as avoid major objections, and thus that employing the principle in the debate is not only desirable, but justifiable. A consequence of the adoption of Alexander's Dictum has been outlined: parties to the debate may need to engage explicitly with questions concerning the nature of powers in order to avoid prejudicing the debate or talking past one another.

Are there strongly metaphysically emergent entities in the sense **AD-3** prescribes: that is, are there any higher-level entities E which possess or confer non-redundant causal powers; powers which are *distinct from* but *novel with respect to* the causal powers of the lower-level entities the Bs upon which E depends? Nothing said in this paper entails any answer to this question, and this is as it should be—specific questions concerning whether or not some putatively strongly emergent entity really is emergent, or whether it can be reduced to the lower level entities upon which it depends, ought to be settled by detailed, empirically informed analyses of the relevant cases.

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