

STEPHEN MUMFORD

THE UNGROUNDED ARGUMENT

1. INTRODUCTION

There is an argument that has yet to be made wholly explicit though it might be one of the most important in contemporary metaphysics. This paper is an attempt to rectify that omission. The argument is of such high importance because it involves a host of central concepts, concerning actuality, modality, groundedness and powers. If Ellis's (2001) assessment is correct, the whole debate between Humean and anti-Humean metaphysics might rest on this viability of the argument.

The argument, which I call the Ungrounded Argument (abbreviated to UA), has in various implicit forms been discussed or defended by Blackburn (1990), Molnar (1999, 2003, ch. 8) and Ellis (2001, 114 and 2002, 74–75). It concerns the alleged possibility of ungrounded dispositional properties or causal powers. It is an argument against a thesis that might be called universal or *global groundedness*; namely, that every dispositional property is grounded in some property other than itself.

In Section 2 I formulate, for the first time, an explicit version of the Ungrounded Argument and present the evidence and reasons for its premises. Along the way, I will clarify some of the key concepts and issues. In Section 3 I consider the likely responses to UA and identify the main basis on which it might be challenged. In Section 4, I try to distil the issue down to its central core and show what must be overcome, and what must be acknowledged, if the argument is to be accepted. The main aim of this paper is the explicit articulation of the argument. Sections 3 and 4 are briefer, therefore, and give only an indication of the lines that may have to be developed for the argument's ultimate acceptance.

2. THE ARGUMENT

The aim is to formulate and defend an explicit version of the Ungrounded Argument. I will actually provide two versions of the

argument, one of which will be simple enough for an easy demonstration of its validity. The less simple version will be useful for illustrating the important issues, which I will explain as I progress, and is close enough in structure to the demonstrably valid version. The full version of UA will be given first. It has four numbered premises, an interim and then a generalised conclusion. The generalised conclusion is contrary to the thesis of global groundedness.

I will take each of the premises of UA, and their explanations, in turn.

[1] There are subatomic particles that are simple.

[1] is a claim about the simplicity of the ordinary subatomic particles invoked and discussed in ordinary physical science. They are not a philosopher's invention or thought experiment. The premise is logically contingent. It is believed to be true but it could be false. There might, after all, be no simples in the world. The world might be infinitely complex; at least, there is not yet an a priori argument against the possibility, however puzzling it might be. The justification for [1] is, therefore, that it is a contingent, theoretical claim of physics.

Whether [1] could be known even a posteriori is a complicated matter. A problem with any atomism is that while I can know something to be complex, I cannot know of something that it is simple. I may believe that something is simple, but it may yet have undiscovered parts and be in reality complex. Hence, if we are to claim any a posteriori knowledge of [1], it would have to be within the context of a rationally acceptable theory. There are too many epistemic concerns to go into here concerning when a theory along with its ontology is rationally acceptable. However, we do not need to know that [1] is true for the argument to proceed. We may just accept that [1] is plausible and that UA has a similar degree of plausibility. We could also, in such a case, note a less ambitious aim of UA. One of its purposes is to show that there is coherence in the notion of an ungrounded disposition. Whether UA shows that there are actually such things will indeed depend upon the acceptability of [1].

But Molnar and others have thought that it is acceptable. Molnar sums up some of the empirical evidence in favour of [1]:

'Collisions have been produced in accelerators with energies over a hundred thousand times above the level at which new structures could have been expected to reveal themselves ... Yet electrons and quarks continue to come out as point-like structureless entities. ... According to all indications the subatomic particles are simple.' (1999, 11).

Presumably, Molnar's last sentence should not be understood as meaning that *all* subatomic particles are structureless, as some things are known that are subatomic and structured. But what such evidence does support is that there are *at least some* subatomic particles that are structureless, and that is all UA requires.

There is the possibility of one major challenge to [1]. It might be argued that at the subatomic level the notion of a particle, particular, or object is inapplicable. There may be, for instance, no identity conditions for such things and no discernability of non-identicals.¹ There may well be no answer to the question whether particle *a* at t_1 is identical with particle *b* at t_2 . However, the issue of whether subatomic particles are objects in the usual sense does not appear to have been agreed, even by those fully informed of all the current best science. Suppose it is eventually found that there are no subatomic *objects*. Would that affect UA? Not in any serious way, I maintain. What UA requires is that something simple bears properties and [1] could be restated in such a way as to contain no commitment to particularity but only to property bearing. That properties can be borne by things other than particulars, such as further properties, is widely accepted, so a world without particulars need not prevent UA getting started.

We move to our second premise.

[2] That which is simple has no lower-level components or properties.

This premise is an analytic, necessary truth. A particular with no lower levels of components or properties could be called a basic, simple, elementary or sometimes bare particular. These notions contrast with that of a molecular particular, which is defined as a particular that is not simple.

A major concept in this debate has been introduced: that of a *lower level*. The claim of global groundedness contains a heavy commitment to there being lower levels of entities and properties that constitute the grounds of dispositions. This is partly because of a commitment to the micro-reductive explanation of dispositions or causal powers. But we need not consider yet the motivations for global groundedness. We can, instead, note that anyone arguing in favour of global groundedness would have an obligation to give a full and plausible account of this notion. UA is an argument against there being a ground for every disposition – against universal or global groundedness – and thus is against there always being a lower level of entities or properties in relation to every disposition.

There is less of an obligation, therefore, to fully explicate these notions of lower levels of properties and components when defending UA. However, some indication of what is being denied must be given, even if it is only an incomplete working definition. How, then, are we to understand what it is for a structure or the property of a structure to be at a *lower level* than another?

The notion of a spatial component or *substantial constituent* seems to be one understanding, where the object in question has spatial parts (see Lowe 1998, 118–119). Hence an atom, in the chemical rather than philosophical sense, has component parts such as protons, neutrons and electrons, which are spatially distinct and possible particulars in their own right (whether they are *actual* particulars or even *substances*, while being components of a molecular particular, need not be answered at present). We would then be able to say that a particular was simple if and only if it had no such spatial parts, such as the point-like particles of subatomic physics. When can we say that particular P_B is a component part of some other particular P_A ? A plausible case would be where the extent of the spatial location of P_B is entirely within that of P_A ; where the spatial *boundaries* of P_B are contained within those of P_A but not necessarily vice versa.² What it means for one particular to be a component of another, on this account, could then be given in terms of the mereological relations between parts. Hence, P_B is a lower-level particular than P_A iff P_B is a part of P_A . We will define this as a transitive relation. However, for our purposes we will rule that P_B cannot be a part of P_A if P_B is identical with P_A . Hence nothing is a part of itself or ground of itself in the sense of ground invoked in global groundedness. There is more on properties being grounds of themselves in Section 4, but such *self-grounding* is not what is required by those who argue for global groundedness.

The notion of a component part is relevant to the notion of the ground of a disposition because it is plausible, both scientifically and metaphysically, that some of the properties of a molecular particular depend on, or are determined by, the properties of its component parts. For example, the *charge* of a molecular particular might depend upon the added positive and subtracted negative charges of its component particulars. The causal powers of a molecular particular might then be understood as the *composition of causal powers* of the parts, using Mill's well-known idea of the composition of causes (Mill 1843, Book III, ch. VI).³

There is a second way in which lower level may be explained, namely in terms of the supervenient–subvenient relation and how it is instantiated among *levels of properties*. This way must be distinguished for the alleged cases of grounding by lower levels of properties, rather than by components. Such a separation may be artificial, as it may be that components ground dispositions only through their properties, and that property grounds, such as the grounding of solubility in a certain kind of structure, might involve a hidden appeal to the components of soluble things. So although it may be unnecessary to talk of lower levels of properties as potential grounds, it will not harm UA to accommodate them.

Where *A* and *B* are two *types* (of universal, property, event, structure, etc.), *A* is said to be supervenient on *B* (and thus *B* subvenient to *A*) when (following Davidson 1970, 214):

- (i) there cannot be two things alike in all *B* respects but differing in some *A* respect, and
- (ii) there cannot be a thing altering in an *A* respect without altering in some *B* respect.

Many other, more refined concepts of supervenience have emerged but the basic Davidsonian definition will be sufficient for the present case. For the purposes of micro-reductive explanation, with which grounds are intimately connected, we will define supervenience as transitive, asymmetrical and irreflexive.⁴ We will then say that *A* is a higher-level type (universal, property, event, structure, etc.) than *B* when *A* supervenes on *B*, even where this is via an intermediate-level property *C*.

It does not really matter whether the lower-level denied in [2] is understood as that which would be provided by a spatial component, by a property, or sometimes one and sometimes the other. We may understand [2] as saying that that which is simple has no lower levels, of whatever nature. Though there remains ample room for further development and precision in these issues, we have enough to progress to the next premise.

[3] The properties of subatomic particles are (all) dispositional.

Premise [3] is supported by physical theory, not just as it is interpreted by philosophers but also by scientists disinterested in this debate. [3] attributes properties to subatomic particles – spin, charge and mass – that all appear dispositional. Ellis defends such a claim as follows:

‘With few, if any, exceptions, the fundamental properties of physical theory are all dispositional properties of the things that have them ... Gravitational mass, for example, is a causal power: it is the power of an object to generate gravitational fields. Charge is a causal power: it is the power of a body to produce electromagnetic fields. The intrinsic angular momentum, or spin, of a particle is its power to contribute to the total angular momentum of a system’ (2002, 47).

Martin says more about why such properties are to be understood as dispositional:

‘The properties of elementary particles or spatiotemporal segments of fields are not structural states. These properties are not in pure act, that is, manifesting at each moment or temporal stage *all* of which they are capable. They have dispositions, not all of which they are manifesting, and – in the nature of the case, *qua* elementary particle – their dispositionality is not explained in terms of properties of their constituents’ (1993, 184).

Such an interpretation of physical theory is not a mere metaphysician’s fancy. A standard reference work of physics (Isaacs 2000) provides the following definitions, which are in clearly disposition-laden terms

Charge A property of some elementary particles that gives rise to an interaction between them and consequently to the host of material phenomena described as electrical. ... Two particles that have similar charges (both negative or both positive) interact by repelling each other.

Mass A measure of a body’s inertia, i.e. its resistance to acceleration. ... Mass can also be defined in terms of the gravitational force it produces. Thus, according to Newton’s law of gravitation, $m_g = Fd^2/MG, \dots F$ is the gravitational force ...

Spin The part of the total angular momentum of a particle, atom, nucleus, etc. that is distinct from its orbital angular momentum.

Note in these definitions the notions of *gives rise to*, *resistance*, *force*, *momentum*, which appear to justify the metaphysician’s classifications of the subject properties. But note, also, that UA requires for success only one such property of a simple particular to be dispositional. The argument is overdetermined, therefore, to the extent that the best theory tells us that elementary particulars have only three basic intrinsic properties and *all*, on the balance of the evidence presented, are dispositional.

I hesitate to label [3] either contingent or a posteriori. It looks to be both, at first face, but I want to leave open the possibility of a metaphysics in which the properties of simple particulars *have* to be causal powers, in which case [3] is metaphysically necessary.⁵

Otherwise, there might be a puzzle about the origin of activity in the world or about how the base-level properties can support higher-level ones. The very notion of *support* seems power-laden. Again, these issues, which might be very involved and complicated, can be set aside from our current concerns.

[4] The grounds of a dispositional property can be found only among the lower-level components or properties of that of which it is a property.

The key terms in [4] have been explained already but there is something more to say about *grounds*. First, something simple: let us specify that something is ungrounded if and only if it has no grounds in anything other than itself. A property that is *only* self-grounded can count as ungrounded for UA. Next: a deeper concern. What is the point of a ground; what role do grounds play in the theory of dispositions? This question's answer could be informative. In answering it, one of the key concerns of the debate between Humean and anti-Humean metaphysics emerges; namely, the status of the *being* or actuality of a property or particular.

A ground of a disposition, such as that invoked in global groundedness, may be understood without the notion of levels of components or properties, as that which enables, supports, affords, permits or points towards some future manifestation and endures between, or without, such manifestations.⁶ Any such manifestation that does occur is usually prompted by some set of circumstances – a stimulus – that might be said to be a cause of the manifestation when the appropriate disposition is possessed. Although such an understanding of dispositions or powers and their grounds is widely accepted as roughly correct, there are a number of complications that accompany it. It might be, for instance, that each time the stimulus event occurs, the disposition fails to manifest because of some interfering factor. It is even possible that the test of a disposition itself eliminates the disposition (Martin 1994). Hence, while dispositions have a very close association with their manifestations, and get their natures in relation to them, there is no ontological dependence on them. Might there be an ontological dependence on something else? Some say dispositions depend on, or are based in, their grounds. Such grounds are categorical, or non-dispositional, in one view (Armstrong 1968, 85–88), though another view allows that one disposition might be grounded in a further disposition (Mellor 1974). UA can remain silent on this disagreement, for it concludes in favour of properties that have no ground of either

kind. For Humeans, however, only grounding in non-dispositions would be acceptable ultimately. Humeans want everything to be built on a solid bedrock of occurrences or occurrent, categorical properties. If one disposition is grounded in another, the Humeans' doubts about dispositions would simply resurface at the next level down.

One thought is that if a disposition can *be*, even when it is not manifested, it evidently exists in some way at those times. The disposition has been said to be grounded in its base. Prior, Pargetter and Jackson (1982) speak of a causal base for each disposition, which plays roughly the role we want grounds to play. They say that the base is actually the cause of the manifestation, upon occurrence of the stimulus. Because they think a disposition is distinct from its causal base, this implies that dispositions are causally impotent. In Mumford 1998 (116–117), it is argued that dispositions must be causally potent, they are powers, so the best move is to allow that disposition tokens are identical with their particular bases. This allows us to make the sensible statement that dispositions themselves enable, support, afford, permit or point towards their manifestations and endure between, or without, such manifestations. Such an account would seem to imply that a disposition is its own ground but [4] rules against this. McKittrick (2003) allows that a property can be a ground of its own behaviour and the identity thesis in Mumford appears to entail this. If one accepts the causal potency of powers then they are indeed their own grounds in that they are the properties that cause their manifestations. But this kind of grounding does not interest us at this point, though it will later. McKittrick says a disposition is 'bare' when it has no causal basis *except for itself*, which we can follow.⁷

We must also rule out the grounding of a dispositional property at a relatively higher level. This is more than just a bare logical possibility as Harré has advocated just such a thing (1986, 295–301). He calls relatively higher-level grounding *ultra-grounding*. But despite his citation of Mach on inertia, there is insufficient description or justification and ultra-grounding appears a *deus ex machina* for the avoidance of the very notion of ungroundedness that UA concludes. The micro-reductive programme has had enough advocates and successes for us to adopt it as the best available account of the source of grounding whereas ultra-grounding has no such advocacy.

In explaining grounding, self-grounding and ultra-grounding, the justification for [4] has also emerged. It is the micro-reductive explanatory model that has sought lower levels of explanation for higher-level phenomena. This justification of [4] may not be acceptable to someone who rejects the general success of micro-reductive explanation. Indeed, if UA is successful, it tells us that micro-reductive explanation *cannot* be generally found. UA is an argument for there being dispositional properties that are not micro-grounded. UA does not strike against ultra-groundedness, which we reject for independent reasons. UA does not have self-grounding as a target either, which would be to allow dispositions that are grounded in nothing but themselves.

Enough, it is hoped, has now been said on grounds for us to understand sufficiently the claim of [4]. We are at last in a position to draw the conclusion of UA. It will be best, for taking stock, to precede the conclusion with the four premises that have been discussed and, it is hoped, justified:

1. There are subatomic particles that are simple.
2. That which is simple has no lower-level components or properties.
3. The properties of subatomic particles are (all) dispositional.
4. The grounds of a dispositional property can be found only among the lower-level components or properties of that of which it is a property.

Therefore,

[5] The dispositional properties of subatomic particles have no ground.

From which it follows by existential generalisation that,

[6] There exist some ungrounded dispositions.

Possible responses to UA, and the most important implications of [6], will be considered in the next two sections. First, the *simplified* version of UA will be presented for a quick demonstration of its validity. This is a semi-formalised argument that is close enough to the fuller UA. If subatomic particles is shortened to sp's, then where:

S = there are sp's that are simple

L = sp's have lower-level components or properties

D = the properties of sp's are dispositional

G = the properties of sp's are grounded,

we can form the following argument, where proposition numbers correspond approximately to those in the original argument, with one additional inferred premise:

1. S
2. $S \rightarrow \neg L$
- 2a. $\neg L$ [1, 2 *modus ponens*]
3. D
4. $G \rightarrow L$
- ∴5. $\neg G$ [2a, 4 *modus tollens*]
- ∴6. $D \& \neg G$ [3, 5 conjunction introduction]

3. RESPONSES

There is an immediate choice to be made between accepting the premises and therefore the conclusion, or rejecting the conclusion and therefore rejecting (at least one of) the premises. We have to decide whether to use UA in a *modus ponens* or in a *modus tollens*. Should we say:

[1–4], *therefore* [5 and 6]

accepting the *modus ponens* or should we say:

if [1–4], then [5 and 6]

It is not the case that [5 and 6]

Therefore, it is not that case that [1–4]?

In favour of *modus ponens*, I would argue that our premises all appear plausible. To recap, [1] was contingent and a posteriori though endorsed, with a few reservations, by science. [2] was necessary. [3] was justified by an interpretation of physical theory that is shared by both metaphysics and orthodox science. [4] turned out to be stipulated but for a very good reason. Although philosophers are always willing to entertain a certain degree of healthy doubt, no matter how good the evidence, we seem in quite a strong position to endorse all of [1–4], which would mean that UA was sound.

Why, then, would we be motivated to look for a *modus tollens*? The simple reason is that [6] is regarded by many, especially those who are Humean inclined, as deeply counterintuitive. For a committed Humean, [6] is wholly unacceptable. The truth of [6], I argue, is equivalent to the falsity of Humeanism as it has been devel-

oped by its latter-day followers. The neo-Humean has no alternative, therefore, other than to treat UA as a *modus tollens*. But the neo-Humean then has the duty to show which of [1–4] are false. I have tried to show in Section 2 why this will be no easy task.

Nevertheless, we ought to know why [6] seems counterintuitive, which is the subject of this section, and we ought to consider whether such an appearance might be dispelled (Section 4). We must return to the issue of grounds but also consider the further notions of actuality and possibility, counterfactuals, truthmakers and directness.

It will be recalled that we were motivated to introduce the notion of a ground to allow a disposition some kind of existence when it was not manifested. Martin has said of dispositions that they are there – ready to go – whether manifested or not (1993, 180). We can sum up what is puzzling about ungrounded dispositions quite simply by posing a probing question. What is the nature and extent of their existence, actuality, or their *being* when they are unmanifested? This can be called the question of *Being*, making use of an ancient term. Ellis considers the same issue in the form of the continuous existence argument (Ellis 2002, 73).

The possibility of unmanifested existence seems essential to being a dispositional property even though we can make sense of a disposition that is continuously manifested; that is, where for all times t_1 to t_n , during which disposition D_1 is possessed, manifestation M_1 of D_1 is present. For example, my bookcase may be disposed to support the books placed upon it and may do so throughout its existence. But for this to be a genuine disposition, it ought to be logically possible that the disposition be possessed though not manifested. Hence, a continuously manifested disposition is not necessarily manifested. Where a property is necessarily manifested, it is non-dispositional or, as some would say categorical (Armstrong 1968) or an occurrence ('occurrent') (see Ryle 1949, ch. 5; Lowe 1982). Almost all who have written on the subject agree with this analysis or something very close to it.

With the ungrounded dispositional properties of elementary particulars, the apparent danger is that as soon as the disposition ceases to be manifested, it ceases to be. It is necessarily manifested, therefore, so not a disposition at all. The Humean might use this as a starting point in the rejection of premise [3]. They might say that, for this reason, spin, charge and mass are not dispositional

properties. But that would be to go against the orthodox interpretation. It would also leave the difficult task of explaining away the forces, resistances, givings of rise to, in non-dispositional terms. It seems that these are causal powers that are there whether or not manifested.

But the puzzling nature of ungrounded dispositions can be taken a step further. For any simple particular that has only dispositional properties, non-manifested, then that particular has nothing about it which is manifested or actual.⁸ But there are no particulars that have nothing manifested. As soon as a particular ceases to manifest, to act, it ceases to be (Simons 2000). So just as ungrounded dispositions apparently cease *being* when they are unmanifested, so do simple particulars if all their (dispositional) properties cease to act.

We can also spell out the problematic nature of unmanifested, 'bare' dispositions in two different ways as they are affected by the two leading theories of what it is to be a dispositional property. Doing so, it is hoped, will show the full force of the Humean objection. The first theory focuses on conditional entailment. This theory is that a disposition ascription has a special relation to a conditional statement: the antecedent detailing the stimulus conditions for that disposition, the consequent detailing the manifestation. Such a view has a long history and has been defended most recently in Malzkorn (2000). The question might naturally arise of what makes any such conditional true. What is the truthmaker, where a truthmaker is whatever in the world makes a truth true?⁹ Ordinarily, an answer is readily available. There is a micro-structural ground, certain other properties of the disposition bearer, which cause such-and-such manifestations upon such-and-such stimulation. In the case of ungrounded dispositions, there is no such ground and so no such truthmaker for any such conditional. As there is no reason to assert any such conditional there is, therefore, no ground to assert the existence or presence of an ungrounded disposition. The possibility of manifestation has no base in anything that is actual, so there is no such possibility.

The second account of dispositions, the intentionality theory, is in terms of directedness. Molnar (2003, ch.3) has recently urged this account and adopted a physical intentionality characterisation of the dispositional, following others including Place (1996), Martin and Heil (1998). Molnar claims that physical states can be directed towards particular manifestations and, when directedness towards such manifestations constitutes the essences of such properties, they

are dispositional properties. Regardless of the merits or demerits of physical intentionality, which will have to be discussed elsewhere,¹⁰ we can note that the same question of *Being* arises. To be a disposition is just to be directed towards some possible manifestation. To be an ungrounded disposition is to be so directed and nothing else. In particular, it is for there to be no micro-structural ground to this directedness: what Molnar calls, and accepts, the missing reduction base (1999, 8). But if such a property is ungrounded, what in the world is it that is directed towards some possible manifestation? Such a property looks like no property at all. It is nothing more than the possibility of some future property when there is a manifestation. An ungrounded disposition has no *Being* between its manifestations. There is no *thing* that is directed towards any other thing, no other states, properties or facts in the world that cause or ground those manifestations – manifestations that need never be actualised.

On both leading accounts of dispositions, therefore, the question of *Being* raises serious concerns about the coherence of the notion of an ungrounded, bare disposition of a simple particular. If we accept the analysis that has been articulated in this section, [6] is unacceptable.

4. THE REALITY OF DISPOSITIONS

The Ungrounded Argument has placed us in a very uncomfortable position. We have four premises that individually and collectively seem plausible. A valid argument derives from them a conclusion that we find counterintuitive and this feeling has not vanished upon closer inspection. We must, therefore, find some way out of the dilemma.

The way out that I think best is a move to the reality of dispositions or powers. Real powers, as good as any other properties, have been accepted by philosophers before, and sometimes in response to implicit forms of the Ungrounded Argument. Martin, Molnar, Ellis and McKittrick accept them. Blackburn, a neo-Humean, does not. However, such appeals to realism about powers have not yet been presented in the strongest light because they have not yet fully faced the problem of the *Being* of ungrounded powers. Consequently, they have not solved it. Neither Ellis nor Molnar have tackled the most difficult form of the problem. The effect has been to hide the full

price of the realist metaphysic. We can, instead, regard it as worth paying by seeing the strength of UA, as I hope has now been established, by seeing what other work an ontology of powers can do, and turning the tables on the Humean resisters by showing the paucity of their own metaphysic. Both Ellis and Molnar have performed the last two tasks admirably so I will offer no contribution in that direction. Instead, in the remainder of the paper, I will try to lay the groundwork for the acceptance of an ontology of bare dispositions.

To begin, we can consider how the sort of concern that was raised in the last section has been discussed by one of the leading realists about dispositions while, nevertheless, steering clear of its most difficult form. Ellis offers a response that is supposed to answer the continuing existence argument. We can see that it is inadequate as it stands. Ellis accepts that dispositions need to be based in reality. Furthermore, he thinks that it is often the case that dispositions are grounded in the relevant categorical structures and constituents of the objects and substances that possess them. But, he argues, 'it is not clear that the basis of any given disposition must, or must ultimately, be non-dispositional or categorical ... For example, the dispositions of an object might well depend on the causal powers of its parts, as well as how these parts are arranged' (2001, 114). So one power can ground another. But this does not answer the form of the continuing existence argument where a particular has no lower-level parts or properties and a disposition has no ground other than itself, not even from another causal power. So Ellis's explanation does not account for such cases – cases that he allows.

I attempt to raise some more general thoughts, therefore, that might lead us to reconsider whether ungrounded dispositions are really so unacceptable or as counterintuitive as the Humean would argue. These thoughts must not ignore the strongest form of the continuing existence argument but, rather, keep it constantly in mind. What is said here can only be a start as this topic deserves a detailed study all of its own.

To begin with, it seems that there are cases where we are prepared to accept that some properties need no grounding other than themselves. When something is square, for instance, we search for no further grounding for its existence and persistence. Squareness depends on nothing other than itself.¹¹ Why can we not say the same about dispositions? It might be argued, that all we know of a disposition is through its manifestations so any actuality other than those manifestations requires some further element. But the same

would be true of squareness. We know of it only when we are testing for it. Nevertheless, we accept that it can still be there even when we are not testing for its presence. Squareness is accepted as actual regardless of what we know and what it does. Why not say the same of dispositions? It would then be those actual properties that are directed towards their manifestations.

Disposition ascriptions are as categorical as any other property ascription, it is only their manifestations that are usually conditional upon something else happening. But in what, actual, does an unmanifested, elementary causal power consist? Nothing other than itself. It grounds its own manifestations. Similarly, an unobserved elementary categorical property, if such a thing there could be, would consist in nothing but itself. Powers are, then, to be regarded as *actual* properties that ground further possibilities.

It might be questioned how we account for the truth of the counterfactuals entailed by disposition ascriptions, on the conditional entailment theory, when those dispositions have no further ground. McKittrick has suggested a possible way out of this problem. The disposition itself is the truthmaker of the counterfactual. To permit ungrounded dispositions is to allow that there can be ungrounded or 'primitive' modal truths. There would thus be nothing in principle unacceptable about allowing ungrounded, 'primitive' counterfactuals, which are a class of modal truths. But we do not want to multiply our primitives unnecessarily. If we take the dispositions to be primitives, counterfactual truths can be made true by them, by the possibilities and necessities they point to, so need not be taken as primitives in themselves.¹² Necessity and possibility would thereby become real modal features of our world and would not have to be smuggled in through an elaborate construction of possible worlds and a highly problematic account of the relations between such worlds.¹³

The reason why resistance to ungrounded dispositions is met is a tacit Humean view about what a property consists in, what actuality or *Being* consists in and what necessity consists in. The greatest neo-Humean has summed up that metaphysic ably:

'Humean supervenience is named in honor of the greater [sic.] denier of necessary connections. It is the doctrine that all there is to the world is a vast mosaic of local matters of particular fact, just one little thing and then another ... We have geometry: a system of external relations of spatio-temporal distance between points. ... And at those points we have local qualities: perfectly natural intrinsic properties which need nothing bigger than a point at which to be instantiated.

For short: we have an arrangement of qualities. And that is all. ... All else supervenes on that.' (Lewis 1986, ix-x).

Dispositional properties cannot be got easily from the limited resources of Lewis's vast mosaic. The Humean world contains no dynamic, active particulars. It contains no intrinsic modal truths. All such modal truths are found only relative to other possible worlds and relations of closeness or similarity. If we accept the Humean view, we will not regard ungrounded dispositions as sufficiently existent.

UA has shown that there are reasons, part philosophical and part scientific, why there could be ungrounded dispositions. Given UA, and the difficulty Humean metaphysics would have in generating ungrounded dispositions, we might consider that we should relinquish the tacit Humean assumption of what can count as something real. There would go our motivation for thinking ungrounded dispositions were insufficiently existent. There would go our source of resistance to the Ungrounded Argument. Ungrounded dispositions, like other modal properties, would be actual – features of reality – and would thus be capable of constituting grounds. They would be that in the world that enabled or pointed towards possible manifestations and would remain actual whether or not those manifestations occurred. The notion of a basic, bare disposition being self-grounded would then turn out to be a quite respectable notion after all. Accept this, and you can accept UA.

5. CONCLUSION

I have tried to indicate why a shift in our intuitions about the existence of dispositions is warranted. For one, there is the Ungrounded Argument, which concludes in their favour. Second, there is the advantage that such powers are modal properties, so we would have an alternative to possible worlds semantics for modal truths which many, in its Lewisian worlds-realist form, have found at best difficult to interpret and at worst incredible and epistemologically opaque.

Our intuitions about ungrounded, elementary dispositions are the biggest preventative to the acceptance of the anti-Humeanism view. I have described exactly what the Humean takes the problem to be. But while acknowledging the full force of the Humean attack, I have also tried to show how at least some of the counterintuitiveness of such powers arises from the implicit acceptance of Humean strictures

on what can count as a property and what sort of thing can count as actual. To accept these strictures is to already give ground to the Humean. If the Ungrounded Argument, and the advantages it can bring, are seen to be sufficiently worthy, the Humean view might yet be overturned. So too might be the Humean accounts of modality.¹⁴

NOTES

¹ I thank James Ladyman for this point.

² This account would need refinement to exclude cases where one thing can be contained wholly within another without being a part of it, such as a lion being within a cage without being a part of the cage. Such cases could be accommodated either by invoking some relation of connectedness between the parts and whole or by denying that the holes within a thing are inside the spatial boundaries of that thing. Further difficulties await either of these strategies but they may not be insurmountable.

³ The possibility of a regress, if lower-level causal powers constitute the grounds of higher-level powers, may be noted here as another possible argument against global groundedness. But this is not the argument I am exploiting in this paper.

⁴ Concepts of the supervenience relation without these properties are conceivable but they would not be the ones useful for micro-reductive grounding.

⁵ This *would* be exploiting the potential argument noted in fn. 3 by noting that only powers can stop the regress.

⁶ As others have noted, 'manifestation' involves some undesirable epistemological connotations. Manifestations are merely events and it is not required that they be manifest to an observer.

⁷ Self-grounding would also salvage the identity thesis in (Mumford 1998, ch. 7). Every disposition has a ground, including bare or basic dispositions, which are their own grounds. There is more relevant to the issue of self-grounding in Section 4, below.

⁸ This follows from the account in [2] of simple particulars having no substructure or substratum.

⁹ The notion of a truthmaker comes from Martin and is frequently invoked by Armstrong, for example in Armstrong (1997, 2).

¹⁰ See Mumford (1999). For a more conciliatory view (see Mumford 2003).

¹¹ There may be debate about whether squareness is an unstructured categorical property and, if it is not, whether it depends on its component properties. If we can find any basic, ungrounded categorical property, let us substitute it in place of squareness.

¹² As this sentence might suggest, I allow the possibility that the counterfactual entailment account of dispositions and the physical intentionality account could yet be forged into a unified theory. The distinction between analytically-conditional-entailing- and non-analytically-conditional-entailing-ascriptions could well be shown to map on to the division in nature between those properties that necessarily contain possibilities within themselves and those that don't. The demonstration will have to be presented elsewhere.

¹³ After claiming that Lewis's project fails, Molnar (2003, ch. 12) argues that primitive modal properties are the truthmakers of modal truths. Instead of explicating powers in terms of counterfactuals, as many have attempted, the truth of counterfactuals would then be accounted for by the existence of powers.

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REFERENCES

- Armstrong, D. M.: 1968, *A Materialist Theory of The Mind*, Routledge, London.
- Armstrong, D. M.: 1997, *A World of States of Affairs*, Cambridge University Press, Cambridge.
- Blackburn, S.: 1990, 'Filling In Space', *Analysis* **50**, 62–65.
- Davidson, D.: 1970, 'Mental Events', in *Essays on Actions and Events*, Clarendon Press, Oxford.
- Ellis, B.: 2001, *Scientific Essentialism*, Cambridge University Press, Cambridge.
- Ellis, B.: 2002, *The Philosophy of Nature: A Guide to the New Essentialism*, Chesham, Acumen.
- Harré, R.: 1986, *Varieties of Realism*, Blackwell, Oxford.
- Isaacs, A. (ed.): 2000, *Oxford Dictionary of Physics*, 4th edn., Oxford University Press, Oxford.
- Lewis, D.: 1986, *Philosophical Papers II*, Oxford University Press, Oxford.
- Lowe, E. J.: 1982, 'Laws, Dispositions and Sortal Logic', *American Philosophical Quarterly* **19**, 41–50.
- Lowe, E. J.: 1998, *The Possibility of Metaphysics: Substance, Identity, and Time*, Clarendon Press, Oxford.
- Malzkorn, W.: 2000, 'Realism, Functionalism and the Conditional Analysis of Dispositions', *The Philosophical Quarterly* **50**, 452–469.
- McKittrick, J.: 2003, 'The Bare Metaphysical Possibility of Bare Dispositions', *Philosophy and Phenomenological Research*, **66**, 349–369.
- Martin, C. B.: 1993, 'Power for Realists', in J. Bacon, K. Campbell and L. Reinhardt (eds.), *Ontology, Causality and Mind: Essays in Honour of D. M. Armstrong*, Kluwer, Dordrecht, pp. 175–186.
- Martin, C. B.: 1994, 'Dispositions and Conditionals', *The Philosophical Quarterly* **44**, 1–8.
- Martin, C. B. and J. Heil: 1998, 'Rules and Powers', *Philosophical Perspectives* **12**, 283–312.
- Mellor, D. H.: 1974, 'In Defence of Dispositions', *Philosophical Review* **83**, 157–181.
- Mill, J. S.: 1843, *A System of Logic: Ratiocinative and Inductive*, Longmans, Green, and Co, London.
- Molnar, G.: 1999, 'Are Dispositions Reducible?' *The Philosophical Quarterly* **49**, 8–17.

- Molnar, G.: 2003, *Powers: A Study in Metaphysics*, S. Mumford (ed.), Oxford University Press, Oxford.
- Mumford, S.: 1998, *Dispositions*, Oxford University Press, Oxford.
- Mumford, S.: 1999, 'Intentionality and the Physical: A New Theory of Disposition Ascription', *The Philosophical Quarterly* **49**, 215–225.
- Mumford, S.: 2003, 'George Molnar and Powers', in Molnar 2003.
- Place, U. T.: 1996, 'Intentionality as the Mark of the Dispositional', *Dialectica* **50**, 91–120.
- Prior, E., Pargetter, R. and F. Jackson: 1982, 'Three Theses about Dispositions', *American Philosophical Quarterly* **19**, 251–257.
- Ryle, G.: 1949, *The Concept of Mind*, Hutchinson, London.
- Simons, P.: 2000, 'Continuants and Occurrents', *Proceedings of the Aristotelian Society*, **LXXIV** (Suppl.), 59–75.

Department of Philosophy
University of Nottingham
University Park
Nottingham NG7 2RD
United Kingdom
E-mail: stephen.mumford@nottingham.ac.uk