

Potency and Modality
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ALEXANDER BIRD

POTENCY AND MODALITY

1. POTENCY AND BEING

Let us call a property that is essentially dispositional a *potency*.[1] David Armstrong thinks that potencies do not exist. All sparse properties are essentially categorical, where sparse properties are the explanatory properties of the type science seeks to discover. An alternative view, but not the only one, is that all sparse properties are potencies or supervene upon them. In this paper I shall consider the differences between these views, in particular the objections Armstrong raises against potencies.

This is a question of ontology. Ontology has a number of terms to describe perhaps different kinds or degrees of 'being'. One can say of something that it is, that it exists, that it is real, and that it is actual. While some philosophers have treated the various pairs of these as equivalent, others have treated the same pairs as distinct. In what follows I will take 'X is', 'X exists', and 'X is real' to be equivalent, and to be true precisely when $\exists y(y = X)$. (The quantifier '$\exists y$' may be taken to be appropriate to entities of X's order. So '$\exists y$' quantifies over properties when X is supposed to be a property.) I shall use the term 'being' in the following way. The being of X consists of those facts that are entailed by the fact that X is, in virtue of the essence of X. In effect this is the reverse of Locke's definition of essence as the being of any thing, whereby it is what it is (Locke 1690/1964, 270). The clause 'in virtue of the essence of X' is required because all necessary facts will be entailed by any fact, but not all necessary facts are parts of every entity's being. Thus, part of the being of the fact that John loves Mary is that fact that John exists (but not the fact that $2+2=4$). The nature of actuality will be addressed later on.

Part of the being of a potency is the existence of a potentiality. Since potencies are essentially dispositional, every potency will have potential manifestations. But these manifestations may be merely potential. A disposition can have unrealised manifestations. So the fact that the fragile glass *would* break if struck is part of the being of the fact that the glass is fragile, even if the glass is never struck and

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never breaks. We may be able to go further and say that the stimulus-dependent potentiality of a potency exhausts its being. There is no more to the essence of a potency than its potentiality. The combination of a potency's stimulus and manifestation are sufficient to identify a potency. The inertial mass *m* just is the disposition to accelerate at rate F/*m* in response to impressed force F. There is no potency other than inertial mass with just that manifestation and stimulus. Of course, the potentiality *may* be manifested, in which case a certain possibility is realised, but equally it may not be manifested.

The fact that the being of a potency is its potentiality is the basis for David Armstrong's critique of potency. The arguments I shall present below are a reconstruction of Armstrong's critique, rather than in every case a verbatim report of them. My initial aim is to present the range of possible arguments of an Armstrongian kind in as perspicuous a manner as possible. The reconstructed Armstrongian critique has two parts, which I call *too much potentiality* (TMP) and *too little actuality* (TLA). 'Too much potentiality' says that only the actual is real. An unmanifested potentiality involves a possibility that is non-actual. So something whose being includes potentiality cannot be properly real. 'Too little actuality' says that because a potency's potentiality exhausts its being, and because potentiality can be *mere* potentiality, the being of a potency has nothing to guarantee its reality.

I shall argue that potencies are no worse off in these respects that Armstrong's alternative, categorical properties which can be related in laws by a relation of nomic necessitation. These considerations lead us to rather more general considerations concerning modality and the being of merely possible entities.

2. TOO LITTLE ACTUALITY

Let us take TLA first. This argument comes in a stronger and a weaker version. The weaker version, whose conclusion is that not all properties can be potencies, I shall present in the next section. The stronger version argues that no property can be a potency. It is not clear that Armstrong in fact espouses that stronger version of the TLA. It will nonetheless be dialectically useful to have considered it. Here is one of the things Armstrong says on the matter.

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> The *first* difficulty [for the Dispositionalist or potency theorist] springs from the fact that a disposition as conceived of by a Dispositionalist is like a congealed hypothetical fact or state of affairs: if this object is suitably struck, then it is caused (or there is a certain objective probability of it being caused) to shatter. It is, as it were, an inference ticket (as Ryle said), but one that exists in nature (as Ryle would hardly have allowed). That is all there is to a particular disposition. Consider, then, the critical case where the disposition is not manifested. *The object still has within itself a reference to a manifestation that did not occur.* It points to thing that does not exist (1997, 79).

The conjunction of 'that is all there is to a ... disposition' and 'it points to a thing that does not exist' hints at or prompts the thought that in the case of the unmanifested disposition at least, there is just not enough actual being for the potency to be real.

Let us suppose that this thought is part of Armstrong's objection to potencies. Would his own view fare better? That is to say, does the being of a categorical property have more actuality than the being of a potency? It is not at all clear that it does. Rather, it seems that categorical properties have *less* being than potencies. The being of a potency includes the power to bring about certain effects (its manifestation). In Armstrong's view, the responsibility for nomic and causal relations resides in the laws. The laws are contingent and are not part of the being of any property, nor are they entailed by the being of any object. Where the potency theorist has just a potency, the categoricalist has a categorical property plus a law. It is the latter that is responsible for what the potency theorist regards as the potentiality of a property.

So it looks as if categorical properties are like potencies but without their potentiality. That is, it looks as if there is very little to the being of a categorical property. What does the essence of a categorical property entail, according to Armstrong? Only the following:

(a) it is distinct from (i.e. not identical with) other properties;
(b) it is a universal and thus can have instances;
(c) it does have at least one instance.

The characteristic (c) is there because Armstrong rejects uninstantiated universals. That issue has no direct bearing on the current one – the potency theorist *could* accept that (c) is true of potencies (although I do not).[2] The potency theorist can also (and should) hold that (b) is true of potencies. Which leaves (a) – that it is part of the essence of a categorical property that it is distinct from other properties. If one accepts the necessity of identity, then one believes

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that it is a necessary truth concerning *any* entity that it is distinct from other entities. I think that a potency theorist can (and again should) accept the necessity of identity. Hence necessary distinctness from other properties will be a feature of both potencies *and* categorical properties. Whether such distinctness is also part of the *essences* of potencies and of categorical properties is perhaps debatable.[3] But presumably, as regards this point, what goes for categorical properties will go for potencies and vice-versa, and so I shall allow that such distinctness is at least part of the being of categorical properties—in which case it is part of the being of potencies too. We may conclude that every characteristic of the being of categorical properties is shared by the being of potencies, while the being of potencies has something more (the characteristic of potentiality). Hence, if the being of potencies lacks enough actuality for them to be real, then the being of categorical properties equally lacks enough actuality for them to be real also.

3. UNGROUNDED DISPOSITIONS?

The weaker version of the TLA argument is expressed in another objection to which those are apt to appeal, who oppose the claim that all properties are potencies. Armstrong puts it this way, "Suppose that a thing acts and as a result some further thing gains a new property.... If and when this new property has its effects, these too will be a matter of gaining, losing or sustaining purely dispositional properties. Is this acceptable?" (1997, 80) Armstrong thinks that this is not acceptable. He concedes to George Molnar a case that seems to provide a model for this situation, when a magnetisable object becomes magnetised. Being magnetisable is a disposition whose manifestation is another dispositional property, being magnetic. But Armstrong denies that this can be generalised, holding that the chain of dispositions must be grounded in a purely categorical basis, so that a dispositionalist will have to concede at least some non-dispositional categorical properties (such as spatiotemporal properties, as in the case of Ellis and Lierse (1994)).[4]

This is a weaker variant on the too little actuality argument considered in the preceding section. Here is the metaphor Armstrong uses: "Given a purely Dispositionalist account of properties, particulars would seem to be always re-packing their bags as they change their properties, yet never taking the journey from potency to act.

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For 'act', on this view, is no more than a different potency" (1997, 80).[5] I take an *act* here to be an event or act that is genuinely actual. Armstrong's accusation is that on the dispositionalist view the manifestation of a disposition is not really an act at all, since it is just another potency. Which is just to say that the potency in question does not have enough being to be truly actual.

Superficially this just seems to be a straight denial of the dispositionalist view that potencies are genuine parts of the actual world. After all, the potency theorist might just reply "I regard potencies as real – so they don't need to take the journey to act in order to become real." In which case the dispute would seem to descend into a clash of intuitions as to whether we can make sense of the idea of a potency being truly actual (without being 'really something else' as Fodor might put it). Armstrong seems to accept this outcome, saying of dispositionalism, "I would hesitate to say this involves an actual contradiction. But it does seem to be a very counterintuitive view."

But the argument has more to it than a clash of intuitions. For as we saw in the previous section, the potency theorist can at the very least say '*tu quoque*'. What is Armstrong's alternative vision of what happens when a particular acquires a new property as the result of the manifesting of a disposition? What is acquired is a categorical property. This may involve the acquisition of a dispositional power, thanks to the way that the categorical property is engaged in the laws of nature. But considering only the essence of the categorical property itself, the particular acquires *less* being (or at least no more being) than it acquires when, according to the potency theorist, it acquires a potency. For a categorical property's being, beyond being an (instantiated) universal, is nothing other than its distinctness from other categorical properties. And this too is a necessary feature of potencies (and any other thing). Consequently, acquiring a categorical property brings with it no more being than acquiring a potency. And so it must be false that both (a) acquiring a categorical property has sufficient actual being to be a true act, and (b) acquiring a potency has insufficient actuality being to be a true act.

4. TOO MUCH POTENTIALITY

The TLA argument accused potencies of having too little actual being to be genuinely real at all. This accusation failed to show what *would* be sufficient actual being. And certainly categorical

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properties have less total being than potencies and the same or less actual being than potencies. By contrast, the TMP argument accuses potencies of having *more* being than they should. Given the response to the TLA argument, the TMP might seem on firmer ground. It can accept that whatever being categorical properties have, potencies have as well. But, so the argument goes, the extra being possessed by the potencies is somehow illegitimate.

There are two respects in which Armstrong regards the (extra) being of potencies as illegitimate. The first respect is what he regards as the intentionality of potencies. The second respect is the non-existence of the extra being, in the case of unmanifested dispositions.

A disposition, says Armstrong, points to its manifestation, and in the case of an unmanifested disposition, it points to something that is non-existent. We may illustrate the case with the property of fragility. The illustration is only an illustration, not an example, because, the potency theorist is entitled to decline to regard fragility as the sort of natural, physically basic sort of property with which he or she is concerned. If an example is required, spin, a property of subatomic particles may meet the case. Spin is the property of a particle, which under the 'stimulus' of motion through a non-uniform magnetic field manifests itself as a force transverse to the direction of travel. We'll stick with the more familiar fragility for illustration. If fragility were a potency, it would essentially be the property whose manifestation is breaking in response to the stimulus of being suitably stressed. This is the case even if the fragile object is not stressed and does not break. Armstrong's 'pointing to' is a metaphor. It is not that the analysis of 'fragile' involves the concept 'breaking', since we are doing metaphysics, not conceptual analysis. Rather it must be an ontological pointing to.

Armstrong has two problems with this pointing to a breaking that did not occur. The first respect in which this pointing to is illegitimate, is that it is a 'pointing to' at all. However the metaphor is spelt out, the basic things in the world should not have this kind of feature, intentionality. An important task for philosophy is to show how the intentional can be explained in terms of the non-intentional, a task which would be pointless if everything is intentional. I shall not pursue this complaint here, mainly because the 'pointing' of potencies is entirely unlike the features of mental intentionality that are regarded as problematic in the philosophy of mind.[6]

More important is Armstrong's complaint that the pointing can be a pointing to what is not actual. In so far as what is pointed to is

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part of the being of the potency, the being of a potency may involve a non-actual state of affairs. So although the being of potencies may have something extra that the being of categorical properties does not have, the charge is that this extra being is illegitimate, in virtue of involving states of affairs that (it is agreed on all sides) are sometimes non-actual, being merely potential. For there seems something wrong with the being of the actual involving the non-actual. Here is how Armstrong puts the point, "... how can a state of affairs of a particular's having a property enfold within itself a relation (of any sort) to a further first-order state of affairs, the manifestation, which very often does not exist? We have here a Meinongian metaphysics, in which actual things are in some way related to non-existent things." (Armstrong 1997, 79, c.f. Crane 1996, 16–17.)

In response to the Too Little Actuality argument, the potency theorist should respond that Armstrong's position would be at least as vulnerable to the same argument, were it sound. Again, in the case of Too Much Potentiality, the potency theorist's response is '*tu quoque*'. Let $D_{S,M}$ be the potency that is the property who essence is to manifest M in response to stimulus S. Armstrong's objection is that some object (call it '**a**') may possess $D_{S,M}$, yet because **a** never receives S it never manifests M. So M**a** is a non-actual possibility. But that it is a possibility is a part of the being of $D_{S,M}$ because that there is that possibility is entailed by the essence of $D_{S,M}$.[7]

Let us see how the same objection would apply to Armstrong's own position. Armstrong rejects the existence of any potency such as $D_{S,M}$. In its place he posits a universal D* and a law relating D* to the universals involved in the stimulus and manifestation (call them S* and M*). The law we may symbolise by N(D* & S*, M*), to show that the universals D* and S* contingently 'necessitate' the universal M*.[8] Let **a** be some object. According to Armstrong, the law N(D* & S*, M*) and the possession by **a** of the categorical property D* are the joint truthmaker for the statements '**a** is disposed to manifest M* in response to S*' and 'were **a** to be S* it would be M*'. And this is the case even if **a** never is S* and so never is M*. Now since a truthmaker entails the truth of the proposition it is a truthmaker for, the existence of the combination of D***a** and N(D* & S*, M*) entails the truth of 'were **a** to be S* it would be M*' and so of 'it is possible that M***a**'. If 'it is possible that M***a**' is true, then it is possible that M***a**. Consequently, the existence of the combination of D***a** and N(D* & S*, M*) entails the possibility that M***a,** a possibility that in this case is non-actual. And so a non-actual possibility is part

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of the being, not of D*a alone, but of the being of the combination of D*a and N(D* & S*, M*) together.

Thus, even on Armstrong's account of dispositions and their related counterfactuals it is the case that the being of an actual state of affairs or a combination of states of affairs, in this case D*a and N(D* & S*, M*), involves some unrealised, non-actual, possibility. If the fact that the being of an alleged X would include a non-actual possibility is a reason to doubt the existence of Xs, it is a reason to doubt the combination of laws and categorical properties on Armstrong's conception.

5. ARMSTRONG, MODAL REALISM, AND MEGARIAN ACTUALISM

So far I have defended potencies against Armstrong's objections by showing that his own view is liable to the same criticism. Is there more to be learned from this exchange? Or are both views mistaken, with a third view being required? My proposal is that because such different views both suffer from the same (alleged) criticism, that criticism must itself be in error. In the remainder of the paper I shall try to diagnose this error, and to draw out some of the more general consequences for modal metaphysics.

The preceding section suggests that any view will have this consequence:

(A) the being of something purely actual (something that is a part of the actual world) can include some unrealised possibility;

if that view accepts either of the following:

(B1) non-trivial counterfactuals can be made true by facts in the actual world alone;

or

(B2) unmanifested dispositions can be parts of the actual world.

For the being of an unmanifested disposition and the being of a counterfactual state of affairs involve unrealised possibilities. And if the unmanifested disposition is fully part of the actual world or the

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counterfactual is true in virtue of the way the actual world is, then unrealised possibilities must be part of the actual world.

The only way of avoiding (A) is by denying (B1) and (B2). Megarian actualists assert that what is is fully actual, and so deny (A). Correspondingly they deny that a disposition can exist without being manifested, i.e. they deny (B2). For example, according to Aristotle, this actualist denies that a thing can act except when it is acting, and so denies, for example, that a builder has the power to build if he is not actually building (c.f. Prior 1985, 12–14).

If the Megarian gives counterfactuals a standard possible world semantics, then counterfactual propositions collapse into the corresponding material conditional. Thus they become trivial—the proposition that the Mr Weedy would lift the one ton car if he tried to build is true so long as he does not try. This requires a denial of (B1) also, because non-trivial counterfactuals are denied. Modal realists, such as David Lewis, also deny (A) and so also deny (B1) and (B2). But in their case they do not reject unmanifested dispositions and unrealised possibilities. So what they reject in (B1) and (B2) is not the existence of these things, but rather that their existence depends solely on the actual world. Their existence depends also on the way things are in other equally real possible worlds.

For this reason the *tu quoque* response to Armstrong's TMP argument is not simply an *ad hominem* of limited interest. Rather it shows that what was held to be a feature (an objectionable feature) of the potency theorist's views is in fact an unavoidable feature of *any* view that accepts the existence of unrealised possibilities without being modal realist. After all, if other possible worlds are not real, the non-actual possibilities, since they exist, must exist in the actual world. That does leave the question, how can the non-actual be part of the actual, without contradiction? But that question is a question that must be answered by anyone who is neither a Megarian nor a modal realist (i.e. by most metaphysicians). I shall return to this question towards the end of this paper.

In rejecting (A) above, the modal realist and the Megarian actualist share a commitment to:

(MR-MA)

> If some unrealised possibility exists, it exists (at least in part) in some other possible world.

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(If A is false, then the being of something purely actual cannot include an unrealised possibility, and in particular the actual world cannot include an unrealised possibility. Hence if some unrealised possibility exists, it exists (at least in part) at some other possible world.)

Where the modal realist and Megarian actualist part company is in their attitude towards the truth or falsity of the antecedent and the consequent of (MR-MA). The modal realist accepts the antecedent and so accepts the consequent. The Megarian actualist denies the consequent and so denies the antecedent also.

Armstrong's TMP argument shows that, officially, he rejects (A). In which case he needs to decide whether he is a modal realist or a Megarian actualist. Clearly he is not a modal realist. So is he a Megarian actualist? It appear that his sympathies are very close to actualism. The argument of this section, to this point, is that if he rejects (A) and rejects modal realism, then he ought to accept Megarian actualism. This is problematic for Armstrong, because he does not want to share the Megarian actualist's rejection our talk of unmanifested dispositions and other unrealised possibilities. Indeed rather than reject all unrealised possibilities, he has a theory about which unrealised possibilities there are. The possibilities that there are, are combinations of elements of the actual world (Armstrong 1989). The key question is then, are these combinations real? Clearly not, with the exception of the one combination that is the actual world. So how do these unreal combinations have any bearing on the truth of modal statements? Armstrong's initial answer was that they are fictions. There are two ways of taking fictionalism. The first takes possibility statements themselves to be fictions. This would parallel Field's fictionalism about mathematics. On this view statements asserting unrealised possibilities are false, but they nonetheless may be useful in certain ways. Such a view would be a version of Megarian actualism. An alternative would be to take 'possibly p' to be true iff according to the fiction of possible worlds there is a world where p. The latter view denies (MR-MA) and so accepts (A). Thus, unrealised possibilities are parts of the actual world. But in an unproblematic way, analogous to the unproblematic way in which the works of Conan Doyle are parts of the actual world. The latter view faces various problems that have been discussed by Gideon Rosen and which have led Armstrong to give up his fictionalism. Now he proposes worlds as mereological sum of atomic entities (particulars, universals). There is not space here to discuss this idea in detail, let alone the objections it faces. It is, nonetheless, worth noting two points

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relevant to the current discussion. First, if mereological sums really do exist without that committing us to modal realism, then they are parts of the actual world. So (A) is true after all on this view. In which case Armstrong cannot rely on the intuitive implausibility of (A) in his TMP argument. Put another way, Armstrong objects that unmanifested dispositions point to unrealised possibilities, and so seem to take us beyond the actual world. But why should we accept that conclusion? Why is it not that they point to a mereological sum, or to something else that is fully part of the actual world?

Second, Armstrong's account of possibility requires as an axiom a principle of Independence – simple entities are (modally) independent of one another. This principle itself entails that no simple property is a potency and since no complex of categorical properties can constitute a potency it entails that no property is a potency. If Armstrong's use of the TLA and TMP arguments are appeals to pre-theoretical intuitions about modality, that is fine. But if we try to make the arguments more robust, by thinking hard about the detailed nature of modality, we find that Armstrong's answer rules out potencies right from the beginning. In which case Armstrong cannot use his answer as the basis of an argument against potencies without begging the question.

6. THERE ARE UNREALISED POSSIBILITIES

In §4 I considered the accusation that the potency theorist imbues the world with unmanifested possibilities. My response was that Armstrong must imbue the world with the same possibilities. Indeed, I argued that anyone must imbue the world with these possibilities unless they are either a Megarian actualist or a modal realist. There is, thus, a very general problem for anyone, such as Armstrong and myself, who rejects both Megarianism and modal realism. In this section, I sketch an answer to this problem. While I do not suggest that it is the only possible answer to this problem, I do think it is the most plausible solution.

Consider the blank piece of paper in front of me. I could turn the piece of paper into an origami swan. But I never will – instead I'll use it to light a fire and then burn it. The fact that I could make it into an origami swan means that it is possible that there is an origami swan. The modal realist accepts these claims, but regards them, in effect, as non-modal claims not about the actual world but

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about other possible worlds. The Megarian actualist will deny the relevant claims. There is no possible origami swan created from my piece of paper, whether in this world or any other. The argument of §5 is that if we reject both of those we have no option but to regard the possibility of the origami swan as a part of this world.[9] But what are possibilities? In this case, it seems pretty clear that the possibility is the possible origami swan itself. That is, for there to be the possibility of an origami swan is for there to be a possible origami swan. And so there are unrealised possibilities. Another way of seeing this is to reflect on the fact that we can count unrealised possibilities just as we count realised ones. I throw a die and the outcome is '3'. Just as there are six faces there were six possible outcomes to the throw, one of which was actual and five of which were merely possible. The fact that we can talk of six (undeniably existent) faces and six possible outcomes in the same breath suggests that the quantification involved in the former is the same as the quantification in the latter and that in both cases the quantifier has maximal scope.

In effect I am suggesting that in rejecting (MR-MA) and accepting (A) we should commit ourselves to the Barcan formula:

(BF) $\Diamond\exists x Fx \rightarrow \exists x \Diamond Fx$

The merits and demerits of the Barcan formula have been much discussed. One of the most convincing reasons for accepting it is that it is a theorem of the most simple and natural systems of quantified modal logic, e.g. S5 plus the normal quantifier rules with identity.[10] It is true that Kripke's semantics for modal logic provides for relatively straightforward models in which BF is false. But it should be noted that the axiomatisation of modal logic then becomes much more complicated. Furthermore, the Kripke semantics is not without its own problems, since it demands of the object language that quantification is restricted to particular domains, corresponding to possible worlds, whereas the metalanguage is not so restricted. In the metalanguage we are able to say that there are things in other worlds that are not in the actual world (indeed we must be able to say this in order to assert that BF is false). That assertion quantifies over entities in all the domains, not just the domain of the actual world. (See Williamson 1998.)

It seems to me that the intuitive rejection of the Barcan formula has its source in the same picture that drives the inclination to think

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that if there is any modality at all, there must be non-actual possible worlds. I suspect also that this picture is supported by the truthmaker principle, accepted by Armstrong, that every truth is made true by some thing. It is noteworthy that Timothy Williamson argues that the truthmaker principle is inconsistent with the converse Barcan formula ($\exists x \Diamond Fx \rightarrow \Diamond \exists x Fx$) (CBF) (Williamson 1999). What picture should replace the one I reject? It is not clear that having any picture is helpful in modal metaphysics. To this extent I am inclined to think that Wittgenstein was right when he instructed us to do away with pictures and instead look carefully at the grammar – if by the latter we understand a careful attention to logic. Part of the problem arises from the way Armstrong and others talk of unrealised possibilities. By talking of 'non-actual' possibilities it is tempting to think that either there really are no such things (Megarian actualism) or that there are such things but only at other, non-actual worlds (modal realism). It would beg fewer questions (and accord better with ordinary usage) to talk of 'unrealised' possibilities rather than 'non-actual' possibilities. There are realised possibilities and there are unrealised possibilities: they are all possibilities. The main difference between the realised and the unrealised possibilities is, roughly speaking, that only the former have non-modalised properties. That is, someone who does make an origami swan has created something with the property of looking like a swan, but the possible origami swan that I could have made but didn't, does not have this property. Rather it is such that it possibly looks like a swan. The former origami swan makes it the case that $\exists x Sx$ (where Sx iff x looks like a swan), whereas my possible origami swan suffices only for $\exists x \Diamond Sx$. In the light of this there is no reason to suppose that the being of potencies extends beyond 'the actual world' (viz. the domain of quantification) into some other possible world. There is but one world and it contains all of the being of potencies.

Timothy Williamson calls the realised possibilities 'concrete' and the unrealised possibilities non-concrete. This terminology invites an Armstrongian objection to the effect that unrealised possibilities conflict with naturalism. As Armstrong puts it: "The merely possible can stand in no causal relation to the actual. Only the actual can have effects upon the actual. Indeed, the merely possible cannot stand in any *external* relation to the actual, for instance in any spatio-temporal relation" (Armstrong 1997, 149).[11] Armstrong also holds that only the causally efficacious exists, in adhering to what he calls the Eleatic Principle: "Everything that exists makes a differ-

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ence to the causal powers of something" (Armstrong 1997; 41). So, it would seem, unrealised possibilities do not exist.

The term 'exists' can be troublesome. From the outset I have taken to exist all on only what there is: x exists iff $\exists y(y=x)$. Even so, it is not clear that Armstrong's principles both are true and at the same time yield the stated conclusion. Reading the Eleatic principle as Armstrong has stated it, it rules out there being two worlds such that in the first x exists but in the second x does not exist, yet the causal powers of everything in the two worlds are the same. CBF rules out such pairs of worlds—what is possible exists at all worlds; so let us put CBF aside and consider the Eleatic principle in Armstrong's terms. Let x be the possible state of affairs which is the possible (but unrealised) manifestation of a potency D in an object **a**. As we have discussed, the existence the state of affairs D**a** entails the existence of x. Now consider a world in which x does not exist. Since the existence of D**a** entails existence of x, a world in which x does not exist is a world in which D**a** does not exist. Hence in the world without x the object **a** cannot possess the potency D. And so the existence of the unrealised possibility, x, does make a difference to the causal powers of something, viz. **a**. So even if it is true that unrealised possibilities do not themselves cause anything, it remains the case that their existence can make a difference to the causal powers of things. Put another way, the Eleatic Principle is satisfied by anything that supervenes on the causal powers of things. And that is true of unrealised manifestations of causal powers of things. So the conclusion that unrealised manifestations are not real (there are no such things) does not follow from the given premises.

Furthermore, there are grounds for asserting that unrealised manifestations of powers *can* enter into causal relations with actual things. Let an object that is not fragile be made fragile by cooling. Let it then be heated again so that it is no longer fragile. During the period of fragility there is an unmanifested disintegration of the object. That unmanifested disintegration, which was not present initially, was brought into being by the cooling of the object. So that cooling caused the existence of the unmanifested disintegration. Hence an unrealised possibility can enter into causal relations, by being an effect of some unarguably real event or fact. Now consider a case where a fragile object is struck and does disintegrate. That disintegration will have various effects (surprise, a noise, a mess, a cut finger). The disintegration is the same event as the possibility of disintegration changing from being unrealised to being realised.

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So it seems correct to say that the possibility of disintegration, by becoming realised, had various effects. The point is most clear on a counterfactual analysis of causation. Had the possibility of breaking not existed (i.e. had breaking been impossible), there would have been no surprise, noise, mess etc.. In this case, then, an unrealised possibility can enter into causal relations by being a cause.

7. CONCLUSION

Potencies, if they exist, are essentially modal properties. That makes them non-categorical in Armstrong's sense. Modal properties are suspect for Armstrong since they go beyond the actual into the realm of the merely possible. For Armstrong the merely possible are non-things; they are not real, they do not exist. This is because mere possibilia (such as unrealised manifestations of potencies) would be a violation of naturalism.

But these concerns do not impact on essentially modal properties, such as potencies, alone. They impact on any non-trivial modal features of the world. And Armstrong does think that the world has modal features – for example he thinks that laws do support counterfactuals. So if Armstrong's arguments were sound, they would spell trouble not only for the potency theorist but also for Armstrong and indeed for anyone who does not think that our modal claims are largely in error. (It is not surprising that Armstrong's earlier views on modality were fictionalist.)

What has gone wrong? My diagnosis is that Armstrong is in the grip of a picture dominated by modal realism, according to which mere possibilia cannot exist with respect to the actual world but can exist with respect to other possible worlds. Thus, if there are modal properties they must be cross-world properties. So it looks as if we are faced with a dilemma. If we accept modal properties we accept other possible worlds (viz. modal realism). But this seems to conflict with causal naturalism, which requires that we posit nothing beyond what is causally active. Or we stick to naturalism and deny the existence of other possible worlds (viz. Megarian actualism).

The way of out of the dilemma is to reject the picture offered by modal realism. Mere possibilia are not things that exist (if at all) in other words but not in this one. The very statement 'mere possibilia are things that exist in other worlds but not in this one' is a contra-

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diction if we accept that to exist is to be: x exists iff $\exists y(y=x)$. The latter thought should encourage us to shift from thinking in pictures and intuitions to reflection on the logic of modality. The simplest axiomatised quantified modal logic, and the one that allows a semantics where the object language and metalanguage are in harmony, is a logic in which the Barcan formula comes out true. The Barcan formula tells us that there are mere possibilia – there are entities that are possibly thus-and-so. (And so, again on the assumption that to be is to exist, mere possibilia exist.)

Returning to our original concerns, it should now be clear that Armstrong has provided no reason to doubt the existence of potencies. In effect the complaint against potencies was their relationship to unrealised possibilities. The essence of a potency entails the existence of a possibility, its manifestation, that might remain unrealised. So the being of a potency might include a mere possibility. Thus, if there is something objectionable about mere possibilia (e.g. that they do not exist), then that is a reason to object to potencies too. But, as we have seen, there is nothing objectionable about mere possibilia, and indeed logic requires them. We need not worry that potencies point to or include something that does not exist. Unrealised manifestations are part of the world as much as manifestations that are realised. The difference is not in reality or in existence, but simply in whether they are realised or not.

NOTES

[1] Sometimes called *powers* (e.g. by Ellis (2002)). I prefer to introduce a technical term that does not have another use.

[2] I discuss Armstrong's instantiation condition and its relation to potencies in (Bird, forthcoming).

[3] C.f. (Fine 1994).

[4] See (Blackburn 1990) for another argument along these lines. Holton (1999) gives a model which shows how we can do with potencies alone.

[5] According to Armstrong ,the metaphor is borrowed from Boyce Gibson's comment on linguistic philosophers.

[6] It should be noticed that some philosophers, such as U. T. Place (1996) and, less directly, Brian Ellis (2002), embrace the mind-likeness of potencies and so do not regard Armstrong's point as a problem at all. In my view, they are mistaken in thinking that potencies are indeed mind-like.

[7] More strictly one should deny this, for the possibility of **Ma** is entailed by the essence of $D_{S,M}$**a** *plus* the possibility of **Sa** (and, more strictly still, even this isn't quite true, because of finks and antidotes – see fn 8 below). This would permit a

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further line of defence against Armstrong. However, we may consider cases where the possibility of **Sa** is itself necessary, or, more generally, cases where necessarily, if $D_{S,M}$**a** is actual, **Sa** is possible. For example, it is necessary that if some vase is fragile it is (metaphysically) possible that it is struck. In such cases, the existence of $D_{S,M}$**a** can be said to entail the possibility of **Ma**, in virtue of its essence. I shall take this to be given in what follows.

[8] To be precise this is not entirely correct, since this implies that whenever a disposition and its stimulus are instantiated the manifestation is also manifested. But as Charlie Martin has shown, this is false, in the case of finkish dispositions. (Martin 1994) It is also false for dispositions subject to antidotes (Bird 1998).

[9] That there are possibilities to be quantified over is most obvious for the truthmaker theorist, since he or she requires the existence (and not just the possible existence) of something to make '$\Diamond\exists xFx$' true. That of course does not tell us what possibilities are. That said, the following does not depend on the truthmaker idea and indeed seems to be inconsistent with it.

[10] Cf. LPC=S5 in (Hughes and Cresswell 1996, 243–244, 312–313) and S5QT= in (Girle 2000, 55–56).

[11] (Original emphasis) I think this assertion could be resisted. After all, it is the possibility of the vase's breaking that causes me to treat it with care. See below.

REFERENCES

Armstrong, D. M.: 1989, *A Combinatorial Theory of Possibility,* Cambridge University Press, Cambridge.

Armstrong, D. M.: 1997, *A World of States of Affairs*, Cambridge University Press, Cambridge.

Bird, A. J.: 2004, 'Strong Necessitarianism: The Nomological Identity of Possible Worlds', *Ratio* **17**, 256–276.

Bird, A. J.: 1998, 'Dispositions and Antidotes', *Philosophical Quarterly* **48**, 227–234.

Blackburn, S.: 1990, 'Filling in Space', *Analysis* **50**, 62–65.

Crane, T. (ed.): 1996, *Dispositions: A Debate*, London: Routledge.

Ellis, E. and C. Lierse: 1994, 'Dispositional Essentialism', *Australasian Journal of Philosophy* **72**, 27–45.

Fine, K.: 1994, 'Essence and Modality', in *Philosophical Perspectives 8: Logic and Language*, J. Tomberlin (ed.), Atascadero, Ridgeview Publishing Co., 1–16.

Girle, R.: 2000, *Modal Logics and Philosophy*, Acumen, Chesham.

Holton, R.: 1999, 'Dispositions All the Way Round', *Analysis* **59**, 9–14.

Hughes, G. and M. Cresswell: 1996, *A New Introduction to Modal Logic*, Routledge, London.

Locke, J.: 1690/1964, in A.D. Woozley (ed), *Essay Concerning Human Understanding*, Fontana, London.

Martin, C. B.: 1994, 'Dispositions and Conditionals', *Philosophical Quarterly* **44**, 1–8.

Place, U. T.: 1996, 'Intentionality as the Mark of the Dispositional', *Dialectica* **50**, 91–120.

Prior, E.: 1985, *Dispositions*, Aberdeen University Press, Aberdeen.

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Williamson, T.: 1998, 'Bare Possibilia', *Erkenntnis* **48**, 257–273.
Williamson, T.: 1999, 'Truthmakers and the Converse Barcan Formula', *Dialectica* **53**, 253–270.

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