Aristotle, Potential and Actual, Conflicts

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In *The Metaphysics* Book Theta, Chapter four, Aristotle claims that to state that "some X is possible but X will never be" is a mistake. In effect, he collapses the possible into the actual. This view conflicts with the existence of dispositions which I argue exist, as they are indispensable to science. In Theta Chapter three, Aristotle sets out a test of possibility whereby we assume that some entity exists and then see if an impossibility ensues. I apply this test to Aristotle's theory and show that it entails the impossibility of dispositions. Given the clear existence of dispositions, Aristotle's conflation of the possible with the actual fails his own test of possibility and must be wrong.

Introduction

In this paper I explore the consequences of a claim which Aristotle defends in *The Metaphysics* Theta, Chapter four. The claim is that it is a mistake to say that "some act is possible without it occurring". By "act" I also mean to include events/entities and objects, such as when we say that it is possible that some car exists, even though that car is never made. I will argue that Aristotle is mistaken in Chapter four when he claims that acts only make sense as possibilities if they do occur at some past or future time. This claim collapses the possible into the actual; for it suggests that every acknowledged possibility has to be actual at some time. Such a view excludes, by definition, any *dispositions* which are never actualised. Dispositions allocate properties to objects that only become manifest under certain conditions, often contrary to fact, that may never be manifested. My glass bottle, for example, has a dispositional property of being fragile (liable to break if dropped or struck). This is true whether the bottle is dropped or not. Aristotle's theory seems to exclude these, as I will argue. Since we have good reason to believe that dispositions exist, it is concluded that Aristotle must be wrong.[1]

[1] I would like to thank two reviewers who significantly improved this paper.

Section A: Aristotle's Conflation of Potential with Actual

In Chapter four of Theta Aristotle seems to defend a position that conflates the possible with the actual in ways that I suggest are problematic. My intent here is to clarify Aristotle's position, and show that it is one he defends, not attacks. Aristotle states that:

> If what has been said is the possible or follows from it, it is evident that it cannot be true to say that this is possible but nevertheless it will not be, the consequence being that in this way what is impossible to be gets away. I mean, for example, if someone were to assert that it is possible for the diagonal to be measured although it will not be measured — someone who does not take into account what is possible — because nothing prevents it being possible for something which neither is nor will be. (*Metaphysics,* 1047b3–9)

I take this to mean that it is a mistake to say that some act is possible, without it actually occurring. The claim I take Aristotle to defend is one that takes statements such as "X is possible" to say that at some time and in some way, "x is/was/will be actual".

This is not the only interpretation of this passage, however. Makin (2006) argues that the view I ascribe to Aristotle is merely one he mentions but then argues against. To continue the above quote:

> But from what is laid down this is necessary, that if we were to assume that something which is not, but is possible, is or has come to be, there will be nothing impossible; but it *will* turn out that there is something impossible, for the diagonal's being measured is impossible. (*Metaphysics,* 1047b9–13)

Makin claims that this seems to be an application of the test of possibility Aristotle developed in Theta Chapter three (1047a24–26). To test the existence of some entity or event, Aristotle argues that we should assume it exists, and see whether anything impossible follows. Take two core statements:

(i) This is possible but nevertheless it will not be (1047b4–5).

(ii) What is impossible gets away (1047b6).[2]

Makin argues that Aristotle here uses his test of possibility against someone who claims that (i) has the consequence that (ii). He does so by applying his test of possibility to (ii), captured (iii):

(iii) If we were to assume that something which is not, but is possible, is or has come to be, there will be nothing impossible (1047b9–11).

Makin argues that Aristotle rejects the argument that (i) entails (ii), by showing that (ii) is proven false by the test of possibility at (iii). Applying the test of possibility to

[2] By "what is impossible gets away", I take Aristotle to mean that we somehow fail to fully understand what it means to be impossible. Compare Ross' translation "things incapable of being would on this showing vanish".

(ii) leads to an impossibility; for the claim at (ii) that "nothing is impossible" clearly conflicts with Aristotle's statement that there is something impossible: the diagonal being measured is impossible. As such (ii) is rejected. Makin believes that under this interpretation, Aristotle's argument "relies on there being true instances of (i)" (Makin, 2006:85).

Makin draws some support from Aristotle's work in *De Interpretatione* (De Int) Chapter nine, where Aristotle accepts the existence of possibility without actuality. At De Int 19a12–14, Aristotle states that it is possible for a cloak to be cut up even though it is not cut up. Makin thinks that this supports his interpretation of Theta Chapter four, and shows that Aristotle is actually arguing against those who say that "something is possible but will never be the case, has the consequence that nothing will be impossible".

I believe that Makin is wrong here and that the first interpretation is correct. Aristotle's statement that the "diagonal's being measured *is* impossible" suggests that it is a mistake to assert that "it is possible for the diagonal to be measured, although it will not be measured" (1047b7–8). Aristotle is not just showing that you cannot argue that (i) entails (ii), or draw from (i), that (ii); what Aristotle seems to be doing is asserting (i), *because* to do so is to lose grip on the idea of what is impossible (ii). The inference here seems rather to be from (ii) to (i): if you do not know what it means for measuring the diagonal to be impossible, you would say that the diagonal *could* be measured *without it being* measured.

Further, Makin's support from De Int Chapter nine is not so clear cut. Aristotle does indeed state that it is possible for a cloak to be cut up and not to be cut up. He is, however, arguing against necessary *existence* rather than un-actualised possibilities. His point there is that it is possible for the cloak to be cut up *and* it is possible for the cloak not to be cut up but wear out first (see 19a15). This, Aristotle argues, shows that "not everything is or happens of necessity" (19a18–19). What Aristotle does not say however, is whether it is a mistake or not were someone to say that a cloak *could* be cut up but *will not* be: it is the move from a possible event to the denial of *that* event as actual that is at issue. Thus, it seems to me that in De Int Aristotle is not addressing necessity and possibility in ways relevant to Theta Chapter four.

Having said all this, as Makin (2006) notes, the first half of Chapter four is a matter of dispute and subject to a variety of interpretations.[3] In some ways, we can set this dispute aside and address the consequences of the claim itself, irrespective of Aristotle's defence or denial of it. But, given the need to decide, I think Aristotle is defending the claim, not attacking it. Assuming for the sake of argument that the claim is Aristotle's, it turns out he was wrong: because possibility without actuality is embodied in dispositions, as I will now argue.

[3] Makin, 2006:82.

Section B: Dispositions

I want to show that Aristotle's view fails his own test of possibility. Aristotle defines "possible" as "that for which, if the actuality of which it is said to have the capacity obtains, there will be nothing impossible" (1047a24–25). Applying this test to Aristotle's claim "that it cannot be true to say that this is possible but nevertheless it will not be" (1047b4–5), we assume its truth and see if it ends in impossibility. My claim is that his view entails the impossibility of dispositions; however I argue that since dispositions do exist in our world, it is clearly not impossible for dispositions to exist. So Aristotle's theory entails an impossibility and thus is wrong.

A disposition is a potentiality, a power to act, or manifest in a certain way, if given the appropriate stimulus.[4] Take some bottle, made of fairly fragile glass. Were I to drop it onto a suitably hard floor from a sufficient height it would break. But suppose I do not. Suppose this bottle is never dropped and is melted down in a recycling plant and turned into a fragile window. We still would say that this bottle is *disposed* to break. It remains true, even knowing that this disposition will never manifest itself, that there is something about the bottle, its fragility, which means that under certain circumstances, it *would* behave in some way. It *does not follow* that these circumstances do come about. Dispositions are, in effect, possibilities that may not occur, and so would be excluded were Aristotle's theory correct.

However, the existence of dispositions is itself something of an enigma, and we might want to deny their existence. At one time, indeed, Mellor, an advocate of dispositions, said that:

> Dispositions are as shameful in many eyes as pregnant spinsters used to be — ideally to be explained away, or entitled to a shotgun wedding to take the name of some decently real categorical property. (Mellor, 1974:157)

Now, the existence of dispositions is problematic in a number of ways. I will focus on two issues: how dispositional properties are grounded in objects; and how we can observe them in objects when they are not manifest. These issues are worthy of whole papers themselves, my purpose here is to show that we cannot just help ourselves to dispositions. Whilst the issues surveyed here constitute problems for dispositions, I do not believe that they are fatal, as I will argue.

Grounding

Dispositions seem to be properties of objects: a glass is fragile because *it* has the property of fragility. But what grounds the property of fragility in *this* bottle? There seem to be two options: first, dispositions are stand-alone properties of objects; and second, they rely upon some other property. Suppose we say that dispositions themselves are properties that we directly attribute to objects. Given that a disposition may

[4] See, e.g. Crane, 2002; Corry, 2011; Williams, 2011; Ashwell, 2010.

never become manifest, it is a strange property for an object to have: every object would have a vast number of properties that point beyond the object itself. Consider, we say the possibility of breaking under circumstance *C* is a property of *this* object, which entails that two scenarios external to the bottle are attributed to the bottle: one where it breaks under *C*; and one where *C* does not occur. Expand to include circumstances for all the other things that could happen to the bottle, and it soon has rather a significant number of properties. But then we have solubility, heating up and many other dispositions that reflect events that could occur to glass bottles. Further, Goodman (1965) argues that more predicates than we usually suppose are dispositional. Goodman thinks that almost every predicate that we take to describe an objective characteristic is as much a dispositional predicate as the usual suspects (fragile, flexible etc.). Attributing dispositions directly to objects thus creates a rather bloated ontology, one that involves factual and counterfactual situations, which therefore, if Goodman is correct, exist in most objects.

Armstrong (2002) finds it hard to believe that an object could have a property that picks out something that does not exist. Armstrong (1968) thinks that there has to be a categorical basis for saying that "this bottle is fragile". This would, he argues, make for a far simpler ontology.[5] Here dispositional properties are entailed by, or supervene on, categorical properties. This brings us to our second option, where dispositions rely on other properties.

Supposing then that Armstrong is correct, and that dispositions derive from underlying categorical properties, we need an account of how these categorical properties appear as truthmakers of dispositional statements. A variety of attempts have been made to identify a categorical base for some disposition. Choi (2008), for example, sets out a conditional formulation of a disposition as a first step in identifying its categorical base. We start with the conditional:

> Something *x* has the disposition at time *t* to exhibit manifestation *m* in response to being situated in stimulating circumstance *c* if and only if, if *x* were to be situated in *c* at *t*, it would exhibit *m*. (Choi, 2008:796, original emphasis)

Choi now reduces this conditional formulation to a categorical dispositional-causal property *D*, common to all objects *x* said to have that disposition. Choi defines *D* as a property or property-complex that, when combined with the appropriate sufficient stimulating circumstances, acts as a causally operative sufficient condition for the manifestation of the disposition.[6] The categorical base, argues Choi, is a causal condition for properties of objects, brought about under certain circumstances, given that the laws of nature are the way they are.

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[5] Armstrong, 2002:16. The use of categorical powers entails a need to explain dispositions, Armstrong notes, and his response to invoke laws of nature, such that a bottle is fragile because if it were struck under circumstance *C*, given the laws of nature, it would break.

[6] Choi, 2008:800.

However, this proves insufficient. We can introduce what is sometimes called a fink to show that such a condition could be met even when the disposition fails to manifest itself. Bird (1998) gives us the following example:

> Suppose I drop the glass and it hits a suitably hard floor. As the glass hits, its micro-structure begins to vibrate and break down. However, simultaneously, due to some other event, the floor itself starts to vibrate such that it creates a counter-wave exactly mirroring the vibration of the glass, such that the glass stabilises and does not break.

The fragile object *is* dropped under stimulating situation *C*, but fails to manifest its fragility. There are ways round this, but suffice it to say the story gets very complicated very quickly. So, identifying what grounds dispositions in objects is rather obscure and convoluted.

Observability

This brings us to our second problem. If dispositions are manifested in future situations, or not at all, how are we to decide *now* whether an object, such as *this* bottle, has that disposition? In other words, why is *this* particular bottle fragile, when compared with *that* bottle, which is its identical twin? Both bottles have the same properties, have the same causal history, are structurally indistinguishable, and so on. If so, then how can I know which bottle would break if dropped, without dropping them? Even then, that one breaks on dropping may not be sufficient to show that the other will, because of finks and so on. Dispositional properties seem to exist independently of any empirical observations. This suggests that observations of properties, internal structures and so on are not sufficient to differentiate between a bottle that is dropped and breaks, and an identical one that is not dropped. There may be a difference here, but it will not become apparent until both bottles are dropped. So, until the bottles are dropped we cannot actually know which one is fragile. Goodman (1965) argues that dispositional predicates seem to ascribe dispositional properties to objects because of possible rather than actual occurrences, and this is like basing them on occult capacities.[7] This problem exists because dispositions are entailed by, but not manifested in, categorical properties. So, there is an issue with knowing which objects have which dispositions, if at all.

Causal role

A supplementary issue now rears its head. Given that attributing dispositional properties is problematic, and that observing them *in* objects is equally difficult, we have a problem deciding under which causal law dispositional properties fall. It

[7] Goodman, 1983:42. Mellor (1974) thinks that this view has no weight, arguing that the occurrence of an event is not necessary for the reality of an object's properties. The properties of most things go unobserved most of the time, so why rely on an event to bring out dispositional ones over and above categorical ones? "[...] the glass's being fragile at that time [in the event of being dropped and breaking] is not an event: it is a property of a thing" (Mellor, 1974:180).

seems simple when we drop the bottle and it breaks, since we can talk of gravity, surface structure and so on. The problem becomes acute when we ask what laws apply when the disposition is not manifest: when fragile bottles are not dropped? Armstrong believes that, where laws are considered to be mere regularities between actual things, "the warrant for extending them to cases that are potential only seem to fail" (Armstrong, 2002:17). We have no reason to subsume mere potential events under laws of nature.[8]

We could couch talk of laws along counterfactual terms, whereby "*if* this bottle *were* dropped, it *would* break". Yet the problems of finks still apply, and no such counterfactual situation exists to support the law. The structure of the description is no help, since as Goodman (1965) suggests, we face problems when describing situations in conditional (counterfactual) terms: all counterfactuals come out true in truth functional terms. Their antecedents are false, and in standard logic the conditional comes out true.[9] We would be equally justified in deriving a contradicting sentence: "*if* this bottle *were* dropped, it *would not* break". Since there is no logically necessary connection between the antecedent and consequent, we must wait for the actual circumstance to occur, but it may never occur. Counterfactuals require empirical confirmation and this may never be available.[10] Counterfactual-characterisations seem of little use for deriving laws.

If we are to invoke the existence of dispositions to prove Aristotle wrong, then we seem to be in a weak position: dispositions cannot easily be grounded in objects, cannot be observed, and have a dubious role in any causal theory. But there is a move which I think suggests we still have good reason to accept the existence of dispositions, despite these issues: they are indispensable for our science, as I now argue.

Section C: The Indispensability Argument

Noting the issues relating to causal laws above, we have good reason to accept the existence of dispositions: they seem indispensable for our science. If so, then they should be taken to exist. And should even one disposition be shown to exist, then Aristotle is undone.

First, Ellis and Lierse (1994) take causality to be dispositional: a causal power is a disposition to produce force of a certain kind.[11] They cite mass as an example of a causal power. Likewise, Crane (2002) points out that Newton's mechanics characterises mass in dispositional terms; how it is disposed to affect a body's acceleration under a given force (Crane, 2002:5).

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8 Noting that Armstrong invokes laws of nature in his response, but not ones that rely on regularities.

9 Note that this issue can be avoided by adopting alternative systems of logic, e.g. intensional or modal logics. I let the point stand, however, as my intention here is to survey only issues seen as problematic to the existence of dispositions, rather than provide a full-blown critical analysis of them.

10 See Stalnaker, 2001.

11 Ellis and Lierse, 1994:40.

Second, Ellis and Lierse propose an example of a dispositional concept central to science: electrons.

> What makes something an electron, for example, is its causal powers, capacities and propensities. An electron is not something which can be identified independently of these. On the contrary, what an electron is disposed to do, e.g., how it is disposed to interact with fields and with other particles, is what makes it the kind of thing it is. A particle is an electron if and only if it is disposed to behave as an electron does. Its dispositional properties are of its essence. (Ellis and Lierse, 1994:32–33)

Here we have at least one thing, an electron, which is described employing dispositions in ways central to our science. If so, we ought to conclude that dispositions exist.

A tangential point can be taken from a thought developed by Hilary Putnam (2001) within the functionalist debate in the Philosophy of Mind. Putnam claims that at the categorical level, "things" we consider to be "red" do not have any actual common property associated with "red", with the possible exception of reflectivity. What they do have, however, is the disposition to emit and absorb wavelengths that bring about in certain perceptual creatures, e.g. humans, an experience of a particular colour. Exact physics wipes out red things having something in common at the very basic level. Under another description however, red things do have something in common, and that has to be described dispositionally.[12] Any science of colour needs to invoke dispositions.

Whilst dispositions are controversial, they are no more controversial than other areas of metaphysics, though this is no reason to accept their existence without further work. Here we have a number of reasons for accepting the existence of dispositions: causal laws may well be dispositional, and scientific entities such as electrons are dispositional. Dispositions are the embodiment of the claim that "to be possible does not entail actual".

Section D: The Type/Token Distinction

Aristotle may have an escape route from my challenge that his claim that saying "this is possible but will not be" is a mistake, fails his own test of possibility, since it entails the exclusion of dispositions, some of which will never be manifest. He may say that we would not, in fact, be making a mistake to say that *this* bottle may break if dropped, even though it never will be dropped. But we would only be correct were other bottles of the same *type* to break when dropped. Here Aristotle could invoke the distinction between types of things, and tokens of them. A Ford Focus, for example, is a *type* of car. The blue Ford Focus in my garage is a *token* of the *type* Ford Focus and there are many such tokens in other garages. When I say that my car would bend if hit, I mean that my car is the same type of entity that bends when hit.

We might use this reasoning to accept Aristotle's claim. We could agree that it would be a mistake to say that this is possible but nevertheless it will not be *unless*

[12] Putnam, 2001:2.

other tokens of the same type do occur. This is a more reasonable proposition, since how could I know if my car would bend if hit unless other cars, of the same *type*, did bend when hit? Here we still have our dispositions, but only because we distinguish between *types* of things and *tokens* of them. A glass bottle is fragile *because* it is the same *type* of bottle that breaks when dropped (invoking caveats such as dropped under certain circumstances etc.). Aristotle's view seems reasonable, as it does not entail an impossibility.

Were the type/token distinction invoked, we could take Aristotle to be making a point that does not entail the impossibility of dispositions, so does not fail his own test of possibility. Thus Aristotle is immune to my criticisms. However, I will now argue that this response on behalf of Aristotle fails; the type/token distinction is not relevant here.

Section E: It's the Type that Matters

We might thus be tempted to rescue Aristotle by invoking the type/token distinction. But this would be a mistake because we see that the distinction is irrelevant to the point being made. When Aristotle states that "it cannot be true to say that this is possible but nevertheless it will not be", he is addressing types, not tokens; and the move above focuses on tokens. Thus the distinction does not succeed as a rescue.

Return to my earlier point about the observability of dispositions. I concluded that "dispositional properties seem to exist independently of empirical observations" and that "observations of properties, internal structures and so on are not sufficient to differentiate between a bottle that is dropped and breaks, from an identical one that is not dropped". The fact that the observation of dispositions proves problematic means that the issue lies at the type level, not the token level. When I say that *this* glass bottle is fragile, I mean that it is the *type* of bottle that breaks when dropped. What decides the issue is whether this bottle is an individual token of a particular *type* of bottle that breaks under some circumstances *C*. Until *C* occurs, we will not know which type of bottle this one is. It seems that the only way to decide is to bring *C* about. Until then, we cannot be sure what *type* this token is: the issue is with the *type* of bottle.

Similarly, Goodman (1965) argues that the type/token distinction could not be "much simpler — or much less illuminating" (Goodman, 1965:44). When we say that some object is flexible, it seems that we may be saying that it is the *type* of thing that flexes: however, he asks, just when are two things the same *type*? We sort tokens into types in many different ways, and it may well be that what actually matters is the disposition. Goodman thinks that it is most likely that types are determined by dispositions. If so, the point stands: the issue with dispositions lies at the level of type.

If we cannot tell what dispositions an entity has until they are manifested, through appropriate stimulating circumstances, then our concern lies at the level of distinguishing types; about what *type* that some bottle is. Thus, making the distinction between type and token is somewhat irrelevant.

This means that Aristotle's criticism of the statement that "Some X could possibly Y, even though that X never will Y" can be seen as a claim that this *type* of thing does not exist. Thus were his view to be correct, dispositions could not exist, since they are the type of things we are justified in saying that "it could but it will never"; Some X is *disposed* to Y. Dispositions exist, by appeal to indispensability to science, therefore Aristotle is mistaken.

Conclusion

I have argued that Aristotle's view of the distinction of the possible and the necessary, where he collapses the possible into the actual, is a view he proposes and not one he attacks. I went on to show that this view conflicts with dispositions which, though problematic and complex, must be accepted as existing because our science relies upon them. Any attempt at a response by employing a type/token distinction cannot succeed because the issue is really about the type of possibility that does not collapse into the actual: Aristotle's claim is that this type does not exist. Since dispositions exist, clearly Aristotle's theory fails his own test of possibility: assuming it correct entails an impossibility.

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