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In Mumford's *Dispositions*, the reader will find an extended treatment of the recent debate about dispositions from Ryle and Geach to the present. Along the way, Mumford presents his own views on several key points, though we found the book much more thorough in its assessment of opposing views than in the development of a positive account. As we'll try to make clear, some of the ideas endorsed in *Dispositions* are certainly worth pursuing; others are not.

Following Mackie, Shoemaker, and others,[1] Mumford stresses that it's one thing to distinguish between dispositional and categorical *ascriptions* and quite another to draw an ontological line between dispositional and categorical *properties*. The book itself can be divided roughly into those chapters that deal with the relationship between dispositional ascriptions and corresponding conditionals (like 'is fragile' and 'would break if struck'); and those chapters that deal with the relationship between dispositions and their categorical bases (like *fragility* and *having internal structure XYZ*). We shall examine each cluster of issues in turn.

1. Dispositional Ascriptions: Finks and Masks

It's uncontroversial that the concept of fragility is connected somehow with the concept of breaking; and likewise for solubility and dissolution, soporificity and sleep, etc.[2] At first pass, a dispositional concept involves some notion of what constitutes a manifestation of that disposition; and perhaps also a notion of what kind of circumstance would trigger the manifestation (being placed in liquid, being ingested, etc.). If this is right, we can understand dispositional predicates like 'is fragile' as elliptical for predicates that

wear their trigger/manifestation conditions on their sleeves, such as 'is disposed to shatter if struck'. Even if this isn't quite equivalent to 'is fragile', it seems reasonable enough to provide a promissory note here,[3] and move on to the project of illuminating 'overtly dispositional' predicates.

The material conditional is clearly inadequate to this task, for 'if struck, shatters' is satisfied by whatever is never struck and whatever shatters, and such things need not be disposed to shatter if struck. It is natural to turn to counterfactuals for help, but before we do so, we should (with Mumford) distinguish certain kinds of analytic projects that may be pursued here. First, one might undertake some kind of reductive conditional analysis of each dispositional claim, one that postulates a necessary equivalence between each given claim and some conditional along with a suitable claim of conceptual priority for the conditional. Second, one might merely look for some mark of dispositional ascriptions that distinguishes them from categorical ascriptions, and have recourse to conditionals in that regard. (We might mention a third approach too: one could hold that dispositional truths supervene metaphysically—and perhaps even a priori—on the global distribution of categorical and counterfactual truths, while admitting there is no simple pairwise reduction of each dispositional claim to some conditional claim.) In brief, Mumford argues that the reductive project is bound to fail but that, nevertheless, one can distinguish dispositional from categorical ascriptions by the fact that a certain kind of counterfactual is a priori entailed by the former (79, 183, 215).[4] This is a claim we'll challenge, first by showing that his preferred solution to the problem of finks and masks is insufficient (in §2) and then by arguing that mere apriori entailment of conditionals isn't enough to distinguish dispositional from categorical ascriptions anyway (in §3). In each case we'll offer a fix that is somewhat in the spirit of Mumford's own approach.

Now to the counterfactuals. Both the first and second projects are threatened by the fact that the counterfactual naturally associated with a given dispositional ascription seems neither necessary nor sufficient for the truth of the ascription. The trouble with 'were x struck, x would shatter'—as a gloss on 'is disposed to shatter if struck'—is that in special circumstances it's false of things that are disposed to shatter when struck. Some such things are protected by *finks*: agents prepared to render fragile things non-fragile if they are struck.[5] Others are protected by *masks* (or *antidotes*), which interfere with the manifestation of a disposition without removing the disposition. A glass's disposition to shatter when struck might be masked by a temporary support structure built to keep it from deforming in any way; or else by a wizard who is ready to exert an equal and opposite force on any object that strikes the glass.[6]

Further, if we want 'were x struck, x would shatter' to entail 'x is disposed to shatter when struck' (as well as the other way round), we face counterexamples in the opposite direction. A different breed of fink (the

destructive rather than protective sort) might be prone to alter the inner structure of my chair to render it fragile just as anyone strikes it.[7] In such a case it would be because of the *fink's* disposition, and not the chair's, that the chair happens to satisfy the counterfactual 'would shatter if struck'. Finally, a kind of reverse-mask might cause the chair to satisfy the counterfactual without even rendering it fragile, by (say) resolving to blow apart the chair if anyone strikes it.

Attempts to fix the counterfactual analysis by adding 'were suitably struck under normal conditions' suffer from the problem of spelling out 'suitably' and 'normal conditions' without explicitly requiring that they ensure shattering (86–87). And Martin points out that if we use a cheap fix like, 'if x is fragile, then if x were struck and nothing happened to remove x's fragility, x would shatter', we must give up hope that it provides a reductive account of the relevant dispositional ascription. (Not to mention that this particular conditional is *false* because of the problem of masking. Nor will a conditional in the other direction hold, because of destructive finks.)

Mumford's own way of handling finks and masks is to replace the rejected 'normal conditions' with 'ideal conditions', where what conditions count as ideal is determined by the context of the disposition ascription, and varies from one context to another (89). He doesn't tell us by what mechanism the conditions are determined, or give any specific examples aside from asserting that finkish circumstances are not (ever?) ideal (89–91).[8] After a few pages, he leaves the issue of conditionals as settled and moves on to discuss the relationship between dispositional properties and their causal bases. This is not particularly satisfying after nearly fifty pages of discussing and rejecting other views about conditionals and dispositional ascriptions. First, the idea that dispositional ascriptions are context dependent is not exactly a new one.[9] Second, as we'll show in the next section, it doesn't (all by itself) solve the problem of finks and masks. But after exploring for ourselves the context-dependence of dispositional ascriptions, we'll suggest a way of overcoming this difficulty.

2. Dispositional Ascriptions: Context Dependence

Let us distinguish two very different ideas that may lie behind the thought that dispositional truths depend on context. One idea—"environment-dependence"—is that the truth of a dispositional ascription to x may in some cases be constituted in part by the environment of x, so that a dispositional predicate, as used on a certain occasion, might divide intrinsic duplicates. (While a certain thing y falls into its extension, an intrinsic duplicate of y may fall into its anti-extension.) On the face of it, there are plenty of dispositional predicates that are used to ascribe extrinsic properties in this way. A thing may be visible but an intrinsic duplicate in a coal pit

not visible. While it has been common to suppose that dispositions are always intrinsic, some recent work (though not Mumford's) supports a face value reading of the data just presented.[10]

This kind of environment dependence does not make for semantic contextualism: it does not imply that, say, the extension of 'is fragile' varies from one occasion of use to another. We should thus distinguish a second thesis, according to which the extension of a given dispositional predicate is ascriber-dependent, so that its extension varies from one occasion of use to another. It is ascriber-dependence that Mumford has in mind when he speaks of context-dependence, since he is explicitly committed to the idea that all dispositions are intrinsic. In any case, it seems that one cannot simply lean on environmental dependence to handle finks and masks: for example, it just will not do, intuitively, to claim that an intrinsic duplicate of a fragile thing will not be fragile when in the proximity of a fink.

A tell-tale sign of ascriber dependence—as opposed to mere environment dependence—is a situation where two ascribers alternatively affirm and deny that some dispositional predicate holds of one and the same subject at one and the same time, and where both judgments seem intuitively correct. Here the data cannot be explained by environment dependence. Example (i) Gulliver, returning from his travels, says 'Lilliputian chairs are very fragile'. The Lilliputians, proud of their craftsmanship, say to each other: 'Our chairs are not like those of our shoddy neighbors. They are not fragile at all.'[11] Example (ii) A poisonous substance is mixed with a second substance. The mixture can be safely drunk. One ascriber treats the mixture as an antidote: 'One of the things in there is poisonous. It is mixed with an antidote to prevent it harming you.' Another treats the second substance as rendering the first no longer poisonous: 'Once you mix the two together, the first is no longer poisonous.' In each of the foregoing examples, it is natural to think that neither party makes a mistake. Slightly different standards for 'being fragile' and 'being poisonous' are at work, none of which are mandated by ordinary English competence.

How exactly does the truth of a dispositional ascription depend upon an ascriber? It might be helpful to begin with the standard contextualist account of 'is tall'. By what mechanism does context determine the semantic value of 'is tall' on a given occasion? Plausibly, a group of people who are salient in that context form a comparison class C such that 'is tall' in that context is equivalent to 'is taller than most people in C'. This also allows for a natural account of 'is very tall'—very roughly: it is satisfied if the subject is taller than the vast majority of people in C. And it fits nicely with our use of locutions such as 'tall-for-a-jockey', which we can understand as ways to fix a comparison class explicitly. (Alternatively we can think of context as directly providing some minimal height required to satisfy 'is tall'.)

At a first pass, what shifts from one context of use to another in the case of 'is fragile' are the circumstances under which it has to be the case that

something would break if struck, in order for that thing to count as fragile in a given context. So 'is fragile' expresses a different property in a human's mouth than in the mouth of the Lilliputians, because the relevant circumstances in which a thing is struck or dropped are different for us than for them. This idea fits nicely with the observation that we often explicitly specify the relevant trigger conditions by going out of our way to say 'is disposed to break if struck at very low temperatures', and the like. When we simply say that something has 'the disposition to break if struck,' we haven't explicitly completed our specification of the relevant trigger conditions for the disposition we are ascribing. We allow context (and common sense) to fill in the rest. Unsurprisingly, different contexts fill in the trigger conditions differently.

We assume that Mumford had something like the foregoing in mind when suggesting that dispositional ascriptions are context-dependent. But he leaves a crucial question unanswered: what is the *mechanism* whereby context settles the relevant trigger conditions, with the result that ordinary contexts rule out finkish conditions? All Mumford tells us is that (1) the relevant conditions with respect to a given context are those that can vaguely be understood as 'normal' with respect to that context, and (2) that actual world conditions are relevant.[12] But the former isn't any more helpful than adding 'in normal circumstances' to the conditional analysis (with the understanding that these don't include finkish circumstances), a move that Mumford himself attacks. And (2) can't be right if an appeal to ascriber-dependence is supposed to square with our intuitions about finks and masks. For suppose that as a matter of fact the fragility of my glass is masked by a support structure; suppose even that someone strikes it and it fails to break. There is an actual-world context where we can truly say 'the glass is fragile', but given (2), it's false that under all conditions settled by that context, the glass would break if struck. In the case of 'tall', plausibly the *salience* of certain people (or a certain kind of person) relative to a context does a lot of work to settle the comparison class. But using salience won't help with masks and finks for 'fragile': it seems that we can ascribe fragility to something even if we've just been discussing the presence of a fink or a mask that is ready to suppress the manifestation. (Note that things count as fragile even if finkish circumstances are *common*, a requirement for relevance perhaps suggested by Mumford's use of 'normal'.)

The upshot, so far, is that there is a good reason for thinking that (some) dispositional ascriptions are context-dependent, but it's not Mumford's reason. And since Mumford hasn't explained why finkish and masky circumstances don't count as 'ideal' (especially if they're actual, common, and salient), the problem of ruling out those circumstances without adhocery re-emerges, this time relativized to contexts.

All is not lost. On the kind of proposal outlined above, we could think of the trigger conditions determined by a context as, roughly, a set of possible circumstances under which a thing would have to break in order to count as

fragile. But perhaps it's too much to require that a fragile thing break in *all* of those circumstances. After all, some things are more fragile than others; and we should have some way of accounting for comparative dispositional ascriptions in our semantics. It's natural to say that for x to count as more fragile than y in a given context requires that x would break in *more* circumstances than y would. Further, holding fixed the circumstances determined by context, we could understand the continuum from 'not very fragile' to 'pretty fragile' to 'very fragile' and so on, in terms of the ratio of relevant circumstances in which x would break to relevant circumstances in which it would not. The point is that, even in contexts where masks and finks are relevant (and actual), it remains the case that a fragile thing would break if subject to the vast majority of relevant circumstances in which that thing is struck.[13] And that's enough to count, in a context, as fragile.[14]

   We postpone further discussion of the mechanisms of ascriber-dependence to another occasion.

3. Dispositional Ascriptions: A Priority

So far we've just discussed the nature of the subjunctive conditionals that are 'intimately related' to dispositional ascriptions. Whatever our account of that issue is, the next challenge is to give an account of exactly what the relationship is between such conditionals and the corresponding ascriptions, especially if this relationship is to constitute the distinguishing characteristic of dispositional ascriptions.

   Recall that one of Mumford's stated goals is to distinguish between dispositional and categorical ascriptions. Let's suppose that in a given context, 'x is fragile' entails 'x would break if it were subject to conditions $E_i \ldots E_n$.' It's tempting to think that entailments of this sort are what makes an ascription dispositional. The trouble is that if the conditions specified in an ordinary and everyday context are quite ordinary and everyday conditions (as Mumford would have it), they do not allow for variation in the actual laws of nature. But then clearly this simple type of entailment can't be enough to establish 'is fragile' as a dispositional ascription. After all, paradigmatically 'categorical' ascriptions will have these entailments as well. For example, if x is knife-shaped and made of steel, it likely follows that if x were subject to the actual laws and pressed against butter in a certain way, it would cut the butter.[15] But we don't want this to mean that 'is knife-shaped' and 'is made of steel' are dispositional predicates. And even if the actual natural laws are *not* held fixed in the relevant conditions, there is the problem raised by Mellor that 'x is triangular' appears to entail that if x's corners were correctly counted, the result would be three.[16] Mumford's preferred reply to 'Mellor's problem' is to distinguish between types of entailment: 'Stronger-than-material conditionals are 'entailed' by both dispositional and categorical ascriptions but in the case of dispositions the

relation is a priori as opposed to a posteriori in the case of categorical ascriptions' (79). Presumably this is what Mumford would also say about the case of 'is knife-shaped.'

There are serious problems with this proposal as a way of distinguishing between dispositional and categorical ascriptions. For one thing, Mumford isn't explicit about what conditionals are apriori entailed by dispositional ascriptions on his view, given his acceptance of context-dependent 'ideal circumstances'. Perhaps he could say that we know apriori, for a given utterance of 'is fragile', that it entails the counterfactual 'if x were struck in one of circumstances $C_1 \ldots C_n$, x would break.' But do we really know a priori exactly which circumstances are 'ideal' in a context? Mumford explicitly says that we don't (91). His exposition suggests that the a priori entailment is as follows: 'x is fragile' in a context entails that there exists *some* relevant class of possible circumstances such that, if x were struck under those circumstances, x would break.

Whatever exactly Mumford has in mind, there are apriori entailments of this sort involving categorical ascriptions. Just consider any categorical 'trigger' predicate, like 'is struck', and switch it with its corresponding disposition. The result is that 'x is struck' in our context apriori entails that there are some relevant circumstances such that if x were fragile and subjected to those circumstances, then x would break.[17] Or again, take some disposition F, which brings about manifestation M when triggered by close proximity to an object that is G. Then let 'H' express the property of being at close proximity to a G-object: surely 'x is H' a priori entails that there are circumstances in which if x were F, x would M. A different kind of example involves specific geometrical claims that can be known a priori. For example, if we first ascribe size and shape to an object, we can deduce apriori various counterfactuals involving its fitting into much larger objects of a specific size and shape—or at least, that there are possible 'ideal circumstances' in which it would fit. Not to mention counterfactuals that can be apriori known to hold of everything, like 'If x were at least two feet away from y, x would be more than one foot away from y'. Clearly, the trouble is that it's a little too easy for property ascriptions to entail subjunctive conditionals involving ideal circumstances, even apriori.[18]

There is a natural fix, however.[19] Let us begin with a contrast. From the information that x is a bachelor, one can a priori deduce that x is a man. From the information that x is a man, one can a priori deduce that if x is unmarried, x is a bachelor. Yet while recognition of the former entailment is intuitively constitutive of mastery of the concept *bachelor*, recognition of the latter entailment is not constitutive of the concept *man*. (Linguists express a related point this way: 'man' is part of the "lexical entry" for 'bachelor', but 'if unmarried then a bachelor' is not part of the lexical entry for 'man'.) Equipped with some such distinction between what is a priori entailed and what is constitutive of concept mastery, there is a natural account of what

makes a concept dispositional well worth considering: while categorical claims might a priori entail certain counterfactuals, appreciations of such entailments is not constitutive of concept mastery, while in the case of dispositional claims, such an appreciation is at the root of concept mastery. On this account the distinction between categorical concepts and dispositional ones will only be as clear as the distinction between what does and doesn't constitute concept mastery (or what is and isn't included in the relevant "lexical entries"). But that is how things should be.

One final point. Mumford is hopeful about the second analytic project mentioned earlier—distinguishing categorical from dispositional ascriptions. But he is not nearly so sanguine about the first—providing a reductive conditional analysis of dispositional ascriptions. Perhaps he is right to repudiate such a project. But the reader is never clear why. In Chapter 3 he dismisses such reductive analyses on account of finks and the like (61). But later he somewhat rehabilitates the tie between conditionals and dispositions in order to pursue the second analytic project. So is the problem that, for each dispositional ascription, there is a good argument that no conditional is sufficient even though one or more is a priori necessary? Or is it that no biconditional between a conditional and a disposition can be reductive? On such matters, the reader is left in the dark.

4. Dispositions and Their Bases: Functionalism

A glass is fragile, it would seem, by virtue of its internal structure. But what is the relationship between *fragility* and the 'realizer' property *having internal structure XYZ*? Unsurprisingly, the space of possible answers mirrors various views on the ontology of mind. (1) The orthodox position we'll call 'role functionalism': dispositional ascriptions ascribe existential generalizations upon causally efficacious properties: like the property of having some property that is causally responsible for breaking when struck (the "second order property" view).[20] (2) According to 'realizer functionalism', dispositional ascriptions ascribe the causally efficacious properties directly. 'Fragility' is just another name for the property *having internal structure XYZ*, albeit one that specifies that property by its causal role. (3) On the 'simple conditional account', to ascribe a disposition to x is not to say anything at all about the presence of a 'realizer' property; it's simply to assert the truth of the corresponding counterfactuals. On this view, *fragility* just is the property of being such that one would break if struck.

Though most of *Dispositions* is devoted to a critical survey of these three positions, Mumford is strangely coy about his own view. For a good part of the book, one has the sense that he is firing on enemy trenches from a concealed position. This would not be so bad, except that the early hints at his position are somewhat misleading, and the case against his rivals is less persuasive once all of his cards are on the table. Moreover, one is perplexed

by his account of the dialectic with his opponents. For instance, at the beginning of his discussion of this topic, he staunchly rejects Prior's thesis that "each disposition is distinct from its causal base" and promises to replace it with the opposite thesis, "each disposition is identical with its causal base" (116–117). Later, he reiterates this: "It is . . . the distinctness thesis . . . that I choose to reject. I replace this thesis with its contradiction: dispositions are not distinct from their causal bases, they are identical with them in a sense to be explained" (144). This way of putting it, perhaps, should have set off alarm bells: if someone says that x and y are identical 'in a sense to be explained', there's a good chance he doesn't really mean that they are identical. In this case, the suspicion is vindicated: it turns out that Mumford emphatically *does not* replace the Prior distinctness thesis with its contradiction. Instead, he changes the subject. By the middle of Chapter 7, the much-vaunted thesis that 'each disposition is identical with its causal base' has morphed quietly into a thesis about *tokens*, one that is perfectly compatible with Prior's distinctness thesis about *properties* (as she herself had pointed out). In fact, Mumford's final position avoids variable realization problems by *adopting* distinctness; and so (of course) his view is inconsistent with the 'contradiction' of distinctness he promised to uphold.

Mumford does, however, have some genuine disputes with Prior's version of functionalism (which is set out in Prior, Pargetter and Jackson 1982 and in Prior's 1982 monograph *Dispositions*). First, he objects to the idea that dispositions are second-order properties:

> We ascribe dispositions to objects, not to properties: we say that the vase was fragile and the sugar was soluble, not that the molecular bonding was fragile and molecular composition *xyz* was soluble; for we ascribe these dispositional terms almost always in complete ignorance of such microstructural properties. To say that something has a functional property is thus [!] not to say that it has a property of having a (first-order) property. It is to say that it has a first-order property but a first-order property for which the causal role can be known a priori from the meaning of the predicate. (189)

But Prior's view *entails* that dispositions are properties of objects. The second-order property Prior identifies with fragility is not a property of categorical properties like *having structure XYZ*, but a property shared by all objects that *have* categorical properties that play a certain causal role. And it's completely irrelevant that we ascribe dispositional properties in ignorance of the nature of the first-order properties we invoke. On Prior's view, one need only have in mind some causal role that they play.

Mumford also argues that dispositions can't be functional properties because on Prior's view

> all properties that play causal roles . . . are categorical properties. This raises the awkward question for Prior's functionalism of how a causally impotent

property can be functionally characterized. To be functionally characterized is to be characterized according to causal role but dispositions on this theory have no causal role. (116)

Somewhat later he adds:

Curiously, Prior agrees that dispositions are functional properties; that is, presumably, causal-role occupying properties. But ... how a causally impotent property can be classified according to its causal role is beyond the understanding of the present author and is certainly not a position he recommends. Indeed it is puzzling that McLaughlin cites Prior's functionalism as 'the leading theory of dispositions today'. (142)

There is no real puzzle here. On Prior's view, objects that have properties that play a certain causal role R all have something in common, namely the property of *having a property that plays causal role R*. This functional property, of course, can be said to be 'characterized (or classified) by causal role R' in the very simple sense that its extension covers all those objects that instantiate R-playing properties.

 Elsewhere Mumford writes:

What is being characterized functionally must be ... the categorical properties— and this starts to look like a monistic theory where a disposition ascription is just the giving of a functional characterization to a categorical property. Here it appears that there is only a division in the way we speak about properties, not a division of properties themselves. (116)

We suspect that Prior's view has this appearance to Mumford because of his penchant for sparseness about universals. But this cannot be an internal difficulty for Prior's view. On its own terms, Prior's view emphatically *does* involve a division of properties: to ascribe a particular R-property is one thing, and to ascribe the property of *having some R-property or other* is another thing altogether. On Prior's view, a dispositional ascription gives a functional characterization of a categorical property *by way* of ascribing a (quite different) property to the object bearing the categorical property.

   This leads us to another problem Mumford has with the standard view, namely the fact that it entails 'property dualism,' the thesis that there is a 'real division in reality' between dispositions and categorical properties. According to the standard view, 'there is a fundamental bifurcation of reality and that to have a dispositional property is a different sort of thing, in some substantial way, from having a categorical property' (95). But surely, unless one has a sparse ontology of properties, there is a natural distinction to be made between a property like *having a property that plays role R*, and all the rest. After all, there *are* such properties, even if they're not what we're talking about when we talk about dispositions. So the fact

that properties can be divided into these two types isn't a particularly controversial feature of Prior's view. If this means that there's 'a fundamental bifurcation of reality', so be it. Distinctions can be good.

The final thesis Mumford rejects is that dispositions are causally inefficacious. This thesis, he says, entails that 'there could be no difference in the way the world was if one minute a particular gained a disposition, then lost it the next minute, then gained it the next, and so on' (123). Not so, at least on Prior's view. Since what second-order properties a thing has supervenes on what first-order properties a thing has, there can be no change in a thing's dispositions without an underlying change in its categorical properties. Mumford goes on in his attack on the causal inefficacy of dispositions: 'When we say that something has gained a property we seem, for this reason, committed to the thesis that its causal powers have been altered in some way' (123). But it *follows* from the standard view that gaining a disposition means gaining a property that plays some causal role. It's just not the disposition *itself* that plays the causal role.

Another reason Mumford gives for the causal efficacy of dispositions is that *all* properties must be causally efficacious. But unless they are especially permissive in their judgments of causal efficacy, proponents of such a view will obviously have to allow that for many predicates, there is no property that they express. (Could we plausibly maintain that the identity relation, the property of being a moment in time, the property of being the third pianist to walk on this spot, and so on, are causally efficacious?) But then, we might wonder, why not say that a dispositional ascription fails to ascribe any single property at all? It might serve simply to assert that x has a property that plays a causal role, without actually *ascribing* the second-order property of having such a property. Then 'fragility' would be an empty name, like (on the sparse view) many of our nominalized predicates. Presumably Mumford would reject this view because he thinks fragility must be causally efficacious. But the truth of sparseness can't then be used as a *reason* for thinking that fragility is causally efficacious. If his argument is: "Only causally efficacious properties exist, and fragility exists, so fragility is causally efficacious," he can't turn around and defend the second premise by invoking the conclusion. In short, given sparseness, the existence of fragility is only as plausible as its causal efficacy, which needs to be established on other grounds.

5. Dispositions and Their Bases: Mumford

We might turn now to Mumford's own view of the relationship between dispositions and their bases. First, we've seen that he ultimately accepts variable realization; i.e., that a dispositional property might have more than one categorical base. (Note that if there is no real categorical/dispositional distinction at the level of properties, this thesis extends as far as the thesis of multiple realization for categorical properties.) Meanwhile, a given

property-*instance* of the disposition is identical with an instance of one of the base-properties. In fact, on Mumford's view, it is instances and not properties (strictly speaking) that are causally efficacious: which causal roles are played by a given property is a matter of the causal roles played by its instances (161). Properties play a causal role only in a secondary, derivative sense.

Now Mumford agrees that to ascribe a disposition to an object is (at least) to say that it has a property with such-and-such a causal role. ("A disposition ascription is a functional characterization of a property. It is to say what causal contribution the possession of that property makes to its owner" (207).) But then what property, on Mumford's view, is actually *ascribed* by the disposition ascription? We might naturally think it would be a second-order property of the kind Prior has in mind. Note that if I say, 'O has a property that Bill likes,' I am not ascribing to O the very property that Bill likes (for example, redness); I'm stating that among O's properties is a property that Bill likes, or (equivalently, if we're generous with properties) ascribing to O the property of having some property that Bill likes. But Mumford explicitly rejects the view that dispositions are second-order properties.

But neither is Mumford's view a variety of realizer functionalism, where a dispositional ascription like 'is fragile' actually ascribes a base-property like *having structure XYZ*. Fragility is a causally efficacious property distinct from any of its lower-level realizers. So apparently, when a glass breaks, both fragility and its base-property are causally responsible. But this causes a problem for his view that he does not consider. According to Mumford, the function of a dispositional predicate is to ascribe *the* property that, when possessed, plays the causal role canonically associated with a disposition predicate (75–76, 205–207). But by his own lights there is no single property that is *the* property that plays that role: a dispositional property and its categorical base both play the causal role associated with the dispositional property. And to suggest (as Mumford apparently does)[21] that a dispositional ascription ascribes only the property that plays the relevant causal role *as a matter of conceptual necessity* would be to put the cart before the horse. For we are told that the dispositional/categorical distinction arises at the level of *predicates* and not properties. But that means that the relevant conceptual truths about a property will depend upon the way one happens to be picking it out, and not vice versa.

What of Mumford's token identity thesis, and the companion thesis that tokens are causally primary, taken as metaphysical theses in their own right? In this vicinity, we all face the danger of unfettered picture-thinking. We might, for instance, be captured by a billiard-ball picture of causation. We then notice that properties are not much like billiard balls, but find no obvious obstacle to some such conception of their instances. We're tempted to conclude that it must be the tokens that are doing the real pushing and pulling. We may even be so taken by the picture as to do little by way of checking how the resulting view lines up with the logical form of ordinary

causal judgments. So much the worse for the latter were a mismatch to occur, or so we tell ourselves.

Mumford offers us very little by way of guidelines for a metaphysics of property instances (though he tells us that they are not tropes and that he also accepts universals in his ontology). Consider the following simple puzzle: It is natural to suppose that if x and y are distinct, then the token Fness had by x is not identical to any token Fness had by y.[22] Now suppose a wall is weak by virtue of part of the wall being weak. Then the token of the property of being weak, as had by the wall, is not identical to the token weakness of its part. But now we have a "threat" of many weakness tokens, fighting among themselves to do something. Perhaps one can learn to live with distinct tokens each of which does causal work—but then why not in the case of a disposition and its base? Or perhaps one might learn to live with the view that the weakness of the wall and other such properties of wholes are not efficacious, not even in a secondary way. But that sort of departure from ordinary language would render one far less sanguine about the causal efficacy of dispositions. Without some reasonably detailed story about property tokens, we cannot begin to make progress.

Here is a further area of concern. As we have seen, it turns out that Mumford thinks that the causal role of a property on some occasion is wholly inherited by the role of its token on that occasion. Assume that some token of *fragility* is a token of *having structure XYZ*. Suppose that this token of XYZ also realizes another disposition, say that of being disposed to retain heat. In case 1, the bearer of the token breaks when dropped. In case 2 the bearer of that token retains heat. It is natural to suppose that the thing's being fragile is relevant in case 1 but irrelevant in case 2. Mumford is especially concerned to vindicate our judgment in case 1. But his manner of doing so appears to make trouble for our judgment in case 2.

These considerations put pressure on us to reinstitute a familiar distinction: even supposing that a token can be a token of two different properties, F and G, it seems that sometimes a token might do its thing by virtue of being an instance of F rather than by virtue of being an instance of G. But once one institutes this distinction, one has to face the challenge that dispositional properties are, ultimately, always epiphenomenal, since a token ultimately does its thing by virtue of being an instance of a non-dispositional property. We are back in familiar territory, trodden over again and again in twentieth century philosophy of mind. One would hope that Mumford would try to show us how to escape from the metaphysical fly bottle. He doesn't.

6. Dispositions and Their Bases: Explanations

Much of what's at issue in the contemporary debate about dispositions can be organized around a puzzle, and the puzzle begins with a familiar joke from Molière. When asked how it is that opium brings about sleep, the

character Bachelierus replies gravely that the drug has the 'dormitive virtue', the power whose very nature is to put people to sleep. The puzzle is to explain why the joke is funny, without giving up on the explanatory power of dispositional ascriptions. The lesson of the joke can't be that explanations involving dispositions are always spurious; but on the other hand they sometimes sound unsettlingly trivial.[23]

On reflection, this feeling of inadequacy only applies in certain contexts. It is most salient when we answer (i) 'Why does drug X cause people to fall asleep?' with 'Because drug X is disposed to cause people to fall asleep'. In this case, the uninformativeness of the answer may well turn on a conceptual link between the habitual expressed by (i) and the overtly dispositional (ii).[24] By contrast, in answer to, 'Why did Bill fall asleep?' it may well be informative to point out that he took opium, and that opium is soporific. As Mumford points out (following Hutchison 1991), we've ruled out a number of other explanations: it was Bill's normal bed-time; the stress and lack of sleep happened to overwhelm him just then; someone cast a spell on him; he did a soporific exercise, etc. One further thing to notice is the explanatory purchase supplied by the distinction between relevant and irrelevant circumstances (see §2 above). In this case, for example, we will have at least implied that Bill was in the right sort of circumstances for the manifestation of soporificity. And that rules out, for example, his having taken an antidote.

Thus far we are more or less in agreement with Mumford on his reaction to the Moliere puzzle. But we take issue with Mumford's suggestion that neither epiphenomenal functionalism nor the simple conditional account have the resources to account for the explanatory significance of dispositional ascriptions (cf. for example 14–15, 118–119). Without worrying about what 'is fragile' means, let us stipulate that 'is fragile*' is to express what Prior means by it and 'is fragile**' to express the content of a 'would break, if struck' (as used on a particular occasion, and understood in line with some suitable elaboration of Mumford's favorite ascriber-sensitive semantics). Is there some obvious explanatory deficiency to saying either 'It was fragile*' or 'It was fragile**' in answer to 'Why did it break?'.36 The suggestions made above for rescuing the explanatory non-vacuity of 'is fragile' seem to extend easily to these predicates, and they show that an explanation can be informative without naming a cause *per se*.

7. Laws and Contingency

We turn finally to the important matter of dispositions and laws, about which we will have to be brief. In the chapter he devotes to the issue ('Laws of Nature Outlawed'), Mumford endorses the view that replaces 'laws of nature with real dispositions as the ultimate, inexplicable units which are the explanations of change' (228); that is to say, 'laws, qua true generalities, if

they exist at all, are ontologically parasitic upon the capacities of particulars rather than the other way round' (230). Further, Mumford endorses the thesis of dispositional essentialism; that is: 'regularities among classes do exist but not because there is a law stating that all of kind K have disposition D' (235), but rather because it's essential to being of kind K that something has the dispositions that K-objects have. For example, 'an electron is an electron solely in virtue of its dispositions to behave; hence anything that was not disposed to behave in this kind of way would not be an electron' (234). Finally, as we've seen, Mumford takes it that dispositions play their causal roles essentially.

Now it might be argued that this cluster of theses leads to the necessity of physical laws.[25] According to Mumford, 'this contentious move [on the part of Ellis and Lierse] is ... unnecessary' because 'that it is in virtue of behaviour B that a particular x is classified within a kind K does not entail that x necessarily has behavior B' (237). So Mumford proposes a 'revised contingency thesis': *which dispositions are possessed by which particulars is a contingent matter*. But something has gone wrong here. Mumford's revised contingency thesis does not save the contingency of physical laws. In fact, it has nothing to do with the necessity or contingency of physical laws, which do not mention particular objects. The claim that physical laws of the form 'all Fs are Gs' are necessary is completely orthogonal to the thesis that nothing is essentially an F or a G. We fail to see how Mumford's point even engages the issue of the necessity of physical laws, let alone demonstrates that the conclusion Ellis and Lierse draw is 'unnecessary'.[26]

Notes

[1] Mackie, 136. Shoemaker, 232.

[2] See Prior's excellent discussion in her 1985, especially Ch. 1.

[3] As appears to be standard in the literature.

[4] Mumford also claims that the two kinds of ascription can be distinguished by the fact that "the causal role" of a property ascribed by a dispositional predicate can be deduced apriori (80). This claim causes tension with his metaphysics of properties, as we argue in note 17 below.

[5] Such an agent would be a 'reverse-cycle' fink, in the terminology of Martin 1994.

[6] Johnston 1992, Bird 1998. In the literature, an *antidote* appears to be a species of mask that involves an actual change in external conditions resulting from the trigger.

[7] This kind of fink is also due to Martin 1994. A related but distinct kind of case is discussed in Smith 1977. (Smith's Z-rays shatter blocks of wood when they are tapped with hammers, but they do this directly, not by rendering them fragile.)

[8] Note that we will want to illuminate not only 'disposed to do well if challenged' but 'disposed to do well even in less than ideal circumstances'.

[9] For example, though she doesn't use the expression 'context-dependent', Prior's (1985) discussion on pp. 46–49 and pp. 7–10 strongly suggests an ascriber-relative context-dependent semantics for 'is fragile'.

[10] For further discussion see McKitrick 2003.

[11] Thanks to Ryan Wasserman, who is a little closer to a giant than most, for this example.

[12] What he says is in fact a little hard to decipher: 'What count as ideal conditions are determined by the context of the disposition ascription. To say something is soluble is to say it will dissolve, in liquid, in a context relative to the ascription. The ascription in the actual world is relative to actual world conditions. It is also relative to actual world conditions that can vaguely be understood as 'normal'' (89).

[13] Relevant circumstances are to be understood as 'environments' in the sense that they are individuated only by features that might affect whether or not x breaks; no two circumstances differ only in the presence or absence of remote and irrelevant objects.

[14] See Manley and Wasserman (ms.) ''A Gradable Approach to Dispositions''. Of course this kind of solution doesn't strictly require context-dependence at all; however, it does fit nicely with the present account of context dependence for dispositions, which is independently motivated.

[15] This example, but not its application, is from Shoemaker 1980.

[16] Mellor 1974. Cf. also Goodman 1955.

[17] A similar kind of problem can be raised for Mumford's other way of distinguishing between the two kinds of predicate, to wit, that ''the causal role'' of a property ascribed by a dispositional predicate can be deduced apriori (80). Here Mumford either means that at least some causal features of the property ascribed by a dispositional predicate can be deduced a priori; or he means that the entire causal profile of the property can be deduced. If the former, then counterexamples involving categorical trigger conditions apply: one causal feature of 'being struck' that can be known a priori is that it brings about breaking in fragile things (under certain conditions). And the latter reading of Mumford can't be right, because (as we'll see) he takes it that the properties only have causal roles in a derived sense, because their instances stand in causal relations. And since he also thinks that instances of fragility are identical to instances of its categorical base(s) (see §5), fragility will have causal features that outstrip those that Mumford thinks can be deduced apriori from an ascription of fragility. We know well enough what he means by 'the' canonical causal role of fragility, but the challenge is to distinguish such a role in principle from the causal features of categorical trigger conditions, which are knowable a priori if the former are. We suspect that here also one would need a distinction between mere a priori entailment and what is constitutive of concept mastery.

[18] We might also point out that on the standard semantics, 'being F' trivially entails 'if it were F it would be F'.

[19] This type of approach is suggested by one kind of locution Mumford employs: ''The conditionals for disposition ascriptions follow by analytic necessity because it is *part of the meaning of* a disposition term that it is a property which causes a particular manifestation if certain conditions are realized'' (183), emphasis ours. Shoemaker uses similar expressions in his (1980). But Mumford is wrong to conclude that counterfactuals are not a priori entailed by categorical ascriptions (79).

[20] This view is set out in Prior, Pargetter and Jackson (1982) and in Prior (1985).

[21] '*d* is a dispositional property iff *d* is a functional role occupying property *by definition*' (198). Also: 'If a causal role is one that [property] *P* occupies as a matter of conceptual necessity, then *P* is dispositional relative to that causal role' (215). The latter passage goes on, apparently in conflict with Mumford's admission of variable realizability: 'Relative to the functional role of causing dissolving when in liquid, a denotation of a property P that has that causal role by conceptual necessity—solubility—is dispositional. Denoted in such a way that does not conceptually necessitate that causal role, perhaps in terms of molecular structure, that same property comes out non-dispositional' (215). But Mumford has in a previous chapter claimed that dispositions like solubility might be realized in different molecular structures; so these properties *can't* be identical for him (160). It is not uncommon to find this kind of tension between separate passages in *Dispositions*, and it makes any elucidation of Mumford's view quite difficult.

[22] In neo-Davidsonian lingo: different occupants of a certain thematic role make for different states.

[23] Admittedly, the Scholastics who were the butt of the joke had an easy reply available to them, as follows. Explanations involving dispositions are perfectly acceptable; and Molière's joke is funny because it possesses a power whose nature it is to cause laughter. *Sed Contra*: It might be objected that, while this explanation accounts for the humor of the first joke, the explanation itself is funny and so the problem recurs. Further, if a similar explanation is provided for the second joke, that explanation too will possess humor unaccounted-for. *Respondeo*: But at some point such explanations are bound to cease being funny, whereupon there will be nothing left to explain and the humor in each of the foregoing explanations will be adequately accounted for.

[24] See Fara (2005) for a discussion of habituals and dispositionals. However, Fara makes a claim of priority for habituals that we don't intend to endorse.

[25] See, e.g., Ellis and Lierse (1994)

[26] The authors would like to thank Ryan Wasserman and Troy Cross for helpful discussions.

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