

## **Introduction**

By

Tim Crane

This book is about the nature of dispositional properties, or dispositions. It is hard to give an uncontroversial definition of the notion of a disposition, since its very definition is one of the matters under dispute. But we can make a start with the following preliminary definition: a disposition is a property (such as *solubility*, *fragility*, *elasticity*) whose instantiation entails that the thing which has the property would change, or bring about some change, under certain conditions. For instance, to say that some object is soluble is to say that it would dissolve if put in water; to say that something is fragile is to say that it would break if (for instance) dropped in suitable circumstances; to say that something is elastic is to say that it would stretch when pulled. The fragility (solubility, elasticity) is a disposition; the breaking (dissolving, stretching) is the *manifestation* of the disposition.

The contemporary philosophical controversy over dispositions is the descendant of earlier disputes—for example, Aristotle’s view of actualities and potentialities, and Locke’s view of secondary qualities as ‘powers’. The recent interest in dispositions arose in two main areas of philosophy: the philosophy of science and the philosophy of mind. The interest in dispositions in the philosophy of science resulted from the logical empiricists’ worries about unobservables—how could the whole of physics be expressed in terms of sense-experiences if physics requires attribution of dispositional qualities, which need have no manifestation in sense-experience?<sup>1</sup> The interest in dispositions in the philosophy of mind largely arose through behaviourist definitions of belief and other mental states, according to which belief is a disposition to act and/or to speak. Among the

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<sup>1</sup>For an influential empiricist account of dispositions, see R. Carnap, ‘Testability and Meaning’ in H. Feigl and M. Brodbeck (edd.) *Readings in the Philosophy of Science* (New York 1953)

questions with which the philosophy of mind grappled were: how should such dispositions be defined, and what explains the possession of such dispositions?

The three participants in the present *Debate* have all made substantial contributions to the philosophy of mind in the last fifty years. U.T. Place is well-known as one of the originators (with Herbert Feigl) of the mind-brain identity theory—and his work influenced other pioneers such as J.J.C. Smart. D.M. Armstrong was one of the first to develop in detail a causal theory of the mind. C.B. Martin had already been an early proponent of the causal theory of mind, and played a crucial role in the development of the philosophy of mind in Australia, which then spread throughout the rest of analytic philosophy's world. Part of Martin's role in influencing the shift from behaviourism to physicalism and functionalism was to insist on the importance of what came to be called the 'Truthmaker Principle': the principle that when a statement is true, there must be something (some fact or event or property) that makes it true.<sup>2</sup>

Each of these three philosophers has developed a distinct conception of the nature of dispositions, conceptions which are central in their thought on mind, matter and causation. In this Introduction I shall give a brief guide to the difference between them. In order to do this I need to say something (not wholly impartial) about the recent background to the debate about dispositions, and a little about how to characterise dispositional and categorical properties.

### **The problem of dispositions**

Dispositions seem to be essential to our characterisation of the world. We protect things that are fragile and valuable; we avoid things that are poisonous; we treat inflammable

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<sup>2</sup>See U.T. Place 'Is consciousness a brain process?', J.J.C. Smart 'Sensations and brain processes' in C.V. Borst (ed.) *The Mind-Brain Identity Theory* (London 1970); D.M. Armstrong *A Materialist Theory of the Mind* (London 1968; reprinted with postscript 1993); H. Feigl, *The "Mental" and the "Physical"* (Minneapolis 1967); C.B. Martin and Max Deutscher, 'Remembering' *Philosophical Review* 1967; for the Truthmaker principle, see chapter 1 of the current volume.

things with care; we gather food which is nourishing; and we admire value people for their dispositions of character: loyalty, honesty, courage and humour.

These characteristics of the world—fragility, poisonousness, flammability, nourishingness, loyalty, honesty courage and humour—are all dispositions. They are all characteristics of things whose nature can be described in terms of how the things would behave in certain circumstances. (Whether this thesis is *always* true of every disposition, and whether their nature can *only* be characterised in these ways are moot points to which I shall return below.) For something to be fragile is for it to be such that it would break in certain circumstances; for something to be nourishing is for it to be capable of giving sustenance if someone were to eat it; and so on.

As well as being so familiar in commonsense thought, dispositions figure too in metaphysical theories of the mind and the world. As I mentioned above, many philosophers (and not just behaviourists) have advanced dispositional theories of belief and other mental states. David Lewis's physicalist functionalism, and the functional role theories of intentional content advanced by philosophers such as Ned Block and Gilbert Harman both appeal to dispositions in their theories, explicitly or implicitly.<sup>3</sup> Another area of philosophy which needs dispositions is the propensity theory of objective probability, which views (for example) the half-life of a radium atom as a disposition of that atom to decay.<sup>4</sup>

In physics and other scientific theories too, properties are often characterised in a dispositional way. A clear example is the property of electric charge: 'that property of some elementary particles that *gives rise to an interaction* between them, and consequently to the host of material phenomena known as electrical'. Or consider valence: 'the *combining power* of an atom or radical, equal to the number of hydrogen

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<sup>3</sup>For Lewis, see 'Psychophysical and theoretical identification' in D. Rosenthal (ed.) *The Nature of Mind* (Oxford 1991). Block's 'Advertisement for a semantics for psychology' and Harman's '(Wide) Functional Role Semantics' are in *Midwest Studies in Philosophy* 1986.

<sup>4</sup>See D.H. Mellor, *The Matter of Chance* (Cambridge 1971); K.R. Popper, 'The Propensity Interpretation of the Calculus of Probability, and the Quantum Theory' in S. Körner (ed.) *Observation and Interpretation* (London 1957).

atoms that the atom could combine with or displace in a chemical compound'.<sup>5</sup> Many physical *specifications* of properties are dispositional specifications; and it is natural to draw the conclusion that the physical properties themselves are dispositions.

Yet despite their many and manifest uses, many philosophers view dispositions with suspicion. I have already mentioned that dispositions were viewed with suspicion by logical empiricists because of their unobservability (as opposed to the observability of their manifestations). Similar scruples lie behind Quine's worry that the notion of a disposition, like that of subjunctive conditional, is 'pretty disreputable', and that if scientific practice does rest on such notions, 'it appears that science is rotten to the core'.<sup>6</sup> But others who are uncommitted to Quine's empiricism find problems with dispositions. Nelson Goodman claims that 'the peculiarity of dispositional predicates is that they seem to be applied to things in virtue of possible rather than actual occurrences—and possible occurrences are ... no more admissible as unexplained elements than are occult capacities'.<sup>7</sup> And more recently Simon Blackburn has claimed that the dispositional nature of properties gives rise to an apparent paradox for theorising in physics. Blackburn argues that since physics characterises properties dispositionally, it never discovers non-dispositional *causes*: 'we can head towards the engine room, but we never get there'.<sup>8</sup>

If it is possible to identify one general feature of dispositions which causes these difficulties, it is what we could call the 'possible absence of manifestation': an object can have a disposition without ever manifesting it. An object can be fragile without ever breaking; food can be nutritious without its ever nourishing anyone; a substance can be soluble without ever being put in water; and so on. There may be difficult cases where it is hard to judge whether we should ever *apply* a dispositional predicate—would we be

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<sup>5</sup>The definitions are from the *Oxford Dictionary of Physics* (Oxford 1991). The emphasis is mine.

<sup>6</sup>'Natural Kinds' in *Ontological Relativity*(New York 1969) p.133. Quine adds that 'rot .. is not the best model here. A better model is human progress.'

<sup>7</sup>*Fact, Fiction and Forecast* (New York 1965) p.42

<sup>8</sup>'Losing your mind: psychology, physics and folk burglar prevention' in J. Greenwood, ed., *The Future of Folk Psychology* p.196

entitled to call someone courageous who had never exercised this virtue in acts of courage?<sup>9</sup>—but these epistemological difficulties do not affect the truth of the undeniable metaphysical claim that an object can have a disposition without ever manifesting it. We must reject, as a general thesis, the view that we are only entitled to attribute a disposition if the object has manifested it at some time (the doctrine of ‘call no man mortal till he die’).

This fact—the possible absence of manifestation—is presumably the reason why Goodman says that dispositional predicates are applied to objects ‘in virtue of possible rather than actual occurrences’. However, this is a confusing way to put the point: since it is perverse to think that an actual object’s actual solubility has anything to do with possible occurrences (if, indeed, there are such entities). D.M. Armstrong expresses this point by saying that we should not think of dispositional statements as made true by ‘counterfactual states of affairs’.<sup>10</sup> And C.B. Martin says that

dispositions are actual though their manifestations may not be. It is an elementary confusion to think of unmanifesting dispositions as unactualised *possibilia*, though that may characterise unmanifested manifestations.<sup>11</sup>

The problem is to say how it can be true that something has a dispositional property when the disposition ‘points beyond’ itself, and never manifests itself—without committing oneself to the idea that dispositions are not actual.

Perhaps the most orthodox response to this question (inspired chiefly by Armstrong) is to explain an object’s possession of a disposition in terms of its possession of a non-dispositional or ‘categorical’ property. So for example, we might say that an object’s possession of the property of solubility is explained in terms of its possessing a certain molecular structure. There are then two ways the explanation could go: one could

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<sup>9</sup>See Michael Dummett ‘The Reality of the Past’ in *Truth and Other Enigmas* (London 1978).

<sup>10</sup>This volume, chapter 1.

<sup>11</sup>C.B. Martin, ‘Dispositions and conditionals’ *Philosophical Quarterly* 1994.

either say (with Armstrong) that the categorical property is identical with the dispositional property. Or one could say that the categorical property ‘realises’ the dispositional property, though it is not identical with it.

For these responses to be clear, the distinction between dispositional and categorical properties has to be clear. But is it? How exactly should we formulate this distinction?

### **The distinction between dispositional and categorical properties**

It is often claimed that the ascription of a dispositional property to a thing entails that certain so-called ‘subjunctive’ or ‘counterfactual’ conditionals are true of it.<sup>12</sup> So for example calling a vase ‘fragile’ entails the conditional ‘if the vase were struck with sufficient force then it would break’.

But this will not suffice to distinguish dispositions from categorical properties. For as Mellor and others have shown, paradigmatic examples of categorical properties entail such conditionals too.<sup>13</sup> Take the apparently categorical property of mass. Newton’s mechanics characterises mass in terms of what difference having a certain mass makes to a body’s acceleration under a given force. In other words, ascription of the property of mass to a body entails a subjunctive conditional stating what a body with that mass *would* do if it *were* to have that force exerted upon it. As Goodman says (putting the point in terms of predicates rather than properties):

more predicates than we sometimes suppose are dispositional ... To say that something is hard, quite as much as to say it is flexible, is to make a statement about potentiality. If a flexible object is one capable of bending under appropriate pressure, a hard object is one capable of resisting abrasion by most other objects. And for that matter, a red object is likewise one capable of certain color-appearances under certain lights; and a cubical object is one capable of fitting try

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<sup>12</sup>By using the term ‘subjunctive’, I do not mean to commit myself to any particular theory of conditionals, nor to the idea that the conditionals in question need be expressed in the subjunctive mood in English, nor to the idea that the conditionals need be counterfactual. My use of scare-quotes is intended as an indication of the current controversy over the classification of such conditionals.

<sup>13</sup>See ‘In defense of dispositions’.

squares and measuring instruments in certain ways. Indeed, almost every predicate commonly thought of as describing a lasting objective characteristic of a thing is as much a dispositional predicate as any other.<sup>14</sup>

This last remark of Goodman's seems to move towards a dispositional characterisation of every property. But he then goes on to say that the non-dispositional predicates of things are 'those describing events ... like bends, breaks, dissolves', and that 'what we want is a criterion in terms of actual occurrences—that is, in terms of manifest predicates—for the correct assignment of dispositional predicates to things'. But this requirement has the consequence that we cannot make sense of ascribing a disposition which has no manifestations—which, as we have seen, is wrong. Mellor illustrates the absurdity of this consequence with the example of safety precautions at nuclear power stations, 'based on the fuel's known disposition to explode in circumstances which the precautions are designed to prevent. It is absurd to suppose that these precautions have no basis unless they are somewhere and sometime unsuccessful'.<sup>15</sup>

Dispositions, then, cannot be distinguished from categorical properties in terms of the idea that attributions of dispositions entail conditionals while attributions of categorical properties do not. Indeed, C.B. Martin has shown that in any case the entailment of conditionals by attributions of dispositions is not a straightforward matter.<sup>16</sup> Martin's conceives of a case in which a conditional (characteristic of a certain disposition) is true, but it is not true in virtue of an object's having the disposition. Consider the following case: an electric current flows from a wire to a conductor whenever the wire and conductor touch. But there is a device (which Martin calls an 'electro-fink') which is responsible for making the wire live when and only when it is touching the conductor. When the wire is not touching the conductor, it is dead. So the truth of the conditional,

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<sup>14</sup>*Fact, Fiction and Forecast* p.41

<sup>15</sup>'In defense of dispositions' in *Matters of Metaphysics* p.111-112

<sup>16</sup>'Dispositions and conditionals' *Philosophical Quarterly* 1994.

‘If the wire were touched by a conductor then electric current flows from the wire to the conductor’

cannot be sufficient to explain what it is for the wire to be live: the conditional can be true when the wire is dead. Dispositions cannot be *reduced* to the facts stated by the conditionals they often entail. (This example is discussed further in chapter 5 of the current *Debate*, and I leave it to the reader to explore its ramifications.)

What should we conclude from these attempts to distinguish categorical from dispositional properties? One response would be pessimistic: that the distinction is unworkable because the notion of disposition is so disreputable, and ought to be abandoned. But surely it is more plausible to take our inability to distinguish dispositions from categorical properties shows that the reality of dispositions should not be impugned by the fact that they can be characterised (say) in terms of ‘what would happen if’—any more than the reality of categorical properties is impugned by the fact that they can be so characterised. Dispositions are real properties, as real as categorical properties .

To say that dispositions are real properties, of course, is not to suggest a contrast between ‘real’ and ‘unreal’ properties. Such a contrast would be spurious: there are no unreal properties. What is meant is rather that a dispositional characterisation of a property picks out a property whose possession makes a real difference to the object which has it, and which can contribute to the causal interactions in which that object participates.

Some philosophers (influenced by Armstrong) resist this last move: they say that dispositions themselves are not causes.<sup>17</sup> Causation is the prerogative of categorical properties. Take the example of the property of being soporific. This is a disposition: for a substance to be soporific is for it to bring about sleep. But on this view *being soporific* is not what causes sleep; what is doing the causing is the chemical property (or

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<sup>17</sup>See the influential paper by F. Jackson, R. Pargetter and E. Prior ‘Three theses about dispositions’ *American Philosophical Quarterly* 1982.

properties) which ‘realises’ the property of being soporific. Soporificity is a second-order property: it is the property of having some property which causes sleep.

Others claim that just as an object’s possession of a disposition can itself be caused, so too can it have effects. Mellor offers the example of ‘a rod so twisted that, when put in liquid helium to make it brittle, it breaks. Its becoming brittle is caused by the cooling, and in turn causes it to break’.<sup>18</sup> Need such cases of causation always need to be underwritten by non-dispositional properties? Armstrong and many others think so. But it is worth considering the alternative: that dispositions can have their causal powers in their own right, and not only by being realised by (or identical with) non-dispositional properties. A disposition might, perhaps, be realised by another disposition. Or—more extreme still—dispositions might (in Simon Blackburn’s phrase) go ‘all the way down’.<sup>19</sup>

Some might think that the fact that dispositions go all the way down is somewhat paradoxical or mysterious. The supposed mystery must be a consequence of the belief that underlying the nondispositional features of reality must be something that cannot be characterised in terms of its power to manifest itself in any way at all: Locke’s ‘something, I know not what’. But to my mind, this ‘something’ is much more paradoxical and mysterious than the reality and causal efficacy of the dispositions *solubility, mass* or *belief*.

These issues, and many more, are dealt with in detail in the chapters that follow. It remains for me to briefly outline the shape of the *Debate*.

## **The Debate**

The participants in the present *Debate* offer three different perspectives on the nature of dispositions. D.M. Armstrong was one of the originators of the dispositional theory of

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<sup>18</sup>‘In Defense of Dispositions’ p.116

<sup>19</sup>Simon Blackburn ‘Filling in space’ *Analysis* 1990. For an application of this idea to the case of mental causation, see Tim Crane, ‘Mental causation and mental reality’ *Proceedings of the Aristotelian Society* 1992.

mind. Armstrong was influenced, at an early stage in his philosophical development, by Gilbert Ryle's view that mental concepts are dispositional concepts. But Ryle's view about dispositions was that

Dispositional statements are neither reports of observed or observable states of affairs nor reports of unobserved or unobservable states of affairs.<sup>20</sup>

It seems a consequence of this that dispositional statements are not reports of states of affairs at all! More cautiously, we could say that Ryle's view is that dispositional statements can be true without requiring them to be made true by the truth of any other statement (for example, a statement concerning categorical properties).

C.B. Martin influenced Armstrong in stressing the importance of the previously mentioned 'Truthmaker Principle': the principle that if a statement is true, there must be something which makes it true. All parties to this *Debate* agree that this Truthmaker Principle is correct. But what is the 'truthmaker' in the case of truths about dispositions? Armstrong argues that the truthmaker for a dispositional statement is always the instantiation of a categorical property. Indeed, he argues that dispositions are literally identical to categorical properties.

To see how this works, let's take Armstrong's view of mental properties as an example. Armstrong holds a functionalist-physicalist theory of mind. His functionalism consists in the view that 'the concept of a mental state is the concept of a state of the person apt for bringing about a certain sort of behaviour'.<sup>21</sup> That is, mental states are dispositions. His physicalism consists in the view that, as a matter of empirical fact, the state of the person in question will always be a brain state (which either is, or is based on some categorical state). So if the mental state is identical to the state of a person apt for bringing about a certain sort of behaviour, and this state is a brain state, then it follows

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<sup>20</sup>Gilbert Ryle *The Concept of Mind* (London 1949) p.125.

<sup>21</sup>*A Materialist Theory of the Mind* (paperback edition, London 1993). p.82.

that the mental state is a brain state. And this is the general pattern of Armstrong's arguments for identifying dispositions with categorical properties generally.

On Armstrong's view, then, properties may have dispositional characterisations; but they will always have other characterisations too. 'Pure powers' do not exist.

A different perspective is provided by U.T. Place, who believes that there are simply two kinds of properties: dispositional properties and categorical properties. Neither is reducible to the other, but both are equally real. Place's theory of dispositions is that they are *intentional* states. In this he is influenced by an observation due to C.B. Martin and Karl Pfeifer. Martin and Pfeifer suggest that the marks of intentionality (which Brentano thought was the essential characteristic of the mental) are actually the marks of dispositionality.<sup>22</sup> The central mark of intentionality which Place considers crucial to dispositionality is the 'directedness' of intentionality: the way in which intentional states like belief are directed upon an object or state of affairs which, as Brentano remarked, need not exist. Place sees this as just a special case of dispositionality. For dispositions are (in a sense) 'directed on' events that need not exist: their manifestations.

Armstrong and Place discuss their differences in the first four chapters. In the fifth chapter, they are joined by C.B. Martin, who holds a very different view of the matter. He shares Place's resistance to the reduction of dispositionality to categoricity: 'dispositionality is as real and irreducible as categoricity'. But he does not agree with Place that there are two kinds of properties, dispositional and categorical. Rather, his 'Limit View' is that no properties are wholly dispositional or wholly categorical; dispositionality and categoricity are the two 'limits', the fixed points relative to which the nature of a property can be mapped. A property will be dispositional to the extent that it has (not necessarily manifested) 'potency' to bring something about. A property will be

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<sup>22</sup>C.B. Martin and K. Pfeiffer 'Intentionality and the non-psychological' *Philosophy and Phenomenological Research* 1986.

categorical to the extent that it involves a ‘potency-free pure act of being’. But no property is wholly either, and ‘to separate one from the other as the really basic property is philosophical artifice and error’.

As we saw above, the notion of a disposition is closely linked to the notion of cause. Armstrong identifies dispositions with their categorical bases, and explains the apparent causal powers of dispositions partly in terms of how these properties (understood here as universals) participate in causal laws. Place is unhappy with Armstrong’s account of universals, and adopts a Humean theory of causation: constant conjunction backed by counterfactual connection between ‘distinct existences’. Martin prefers to replace the notion of cause and effect with the notion (more appropriate to his metaphysics) of *reciprocal disposition partners for mutual manifestation*: when salt dissolves in water, the salt and the water are reciprocal partners. The salt and the water lend themselves to each other for mutual manifestation.

The interplay between these three positions—on dispositions and on causation—provokes the fruitful discussion which forms the substance of this book. The book as a whole forms a lively illustration that the subject of dispositions is central not just to the philosophy of mind, but to metaphysics as a whole. And if there is one agreement we can tease out of all the disagreement, it is this: an understanding of dispositions must be central to an understanding of the nature of our world.