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Critical Notice of Tim Crane ed. *Dispositions: A Debate* by D.M. Armstrong, C.B. Martin and U.T. Place, Routledge, London and New York, 1996, viii + 197 pp.)

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This is a book on one of the most central issues in current metaphysics by three figures who are and have been right in the eye of the storm, from the early days of the Australian mind-brain identity theory right through to the present day. Understanding and misunderstandings of dispositions lie at the heart of the mystery of consciousness, one of the philosophical preoccupations most distinctive of the twentieth century. It does so at the end of the century just as surely as it did mid-century in the hey-day of philosophical behaviourism, as exemplified for instance in Gilbert Ryle's book on *The Concept of Mind* (1949).

Armstrong, Place and Martin take three different stands on the nature of dispositions. These three theorists approach the theory of dispositions from three contrasting metaphysical frameworks: Armstrong being a *realist* about universals, Place a *conceptualist*, and Martin a *nominalist* (on at least one defensible way of historically grounding this label in paradigm "nominalists" like William of Ockham). One way to use this book is as a source of arguments for and against various versions of these three metaphysical standpoints. And yet for some purposes the metaphysics can be placed in the background as mere bookkeeping. When thoroughly thought-through, it begins to appear even to the three disputants themselves that the three frameworks come very near to being mere *notational variants* of one another. In reviewing this book we will not attend to the metaphysics of universals. We will focus on dispositions, ignoring as far as we can the various interesting differences among the three theorists' rival views on the ancient problem of universals.

Compare three properties: the *solubility* of salt in water, the negative *charge* of an electron, and the *spherical* shape of a planet. The stereotype of a "dispositional" property effortlessly appropriates *solubility*, distances itself as far as it can from so-called "categorical" properties like *sphericity*, and vacillates over some of the fundamental properties in physics, such as *charge*.

On dispositions, Place is what you might call a *disposition-dualist*: he affirms the distinct existence of both dispositional and categorical properties; and he is, furthermore, what you might call an *interactionist* dualist, because he affirms the existence of two-way causal relations between dispositional and categorical properties. Armstrong, by contrast, is a *disposition-materialist*: he says that there are no properties over and above categorical properties, and that dispositional properties are to be identified with categorical ones. The rival extreme "monist" thesis would be *disposition-idealism*; this doctrine would deny the distinct existence of dispositional and categorical properties, but would assert that there are no properties over and above dispositional ones. This third extreme alternative is not quite the view held by the third figure represented in this book. Rather, Martin holds a fourth doctrine, which might best be viewed as a *double-aspect theory* of dispositions: that *every* property has both an "intrinsic" (or "categorical") side, and a "dispositional" side.

What emerges out of the three-way debate on these issues? This book furnishes fertile soil within which many different theories could take root and extract nourishment. There are a very great many cross-currents at work in this book; so to keep a clarity of focus we will come clean and reveal the lessons which we take from this book. (1) We would argue that Place is right to defend *disposition-dualism* (though we think he is wrong to think that there is a *causal* relation between a dispositional property and its categorical basis). (2) We would argue that Martin is right to insist that *every* property has both an "intrinsic" nature and a "dispositional" side (though we are unpersuaded that any of the "intrinsic natures" of these properties are as "non-physical" as Martin thinks some of them are). (3) That leaves us agreeing with Armstrong that every dispositional property has a "categorical basis", and that you can refer to a categorical property either through its intrinsic nature or through its dispositional display (though we are unpersuaded of his claim that there is no dispositional property distinct from its categorical basis). Out of these three distilled agreements (and

disagreements), we believe that a coherent theory emerges. The theory which emerges is a development of the position outlined in "Three theses about dispositions" by Jackson, Pargetter and Prior (1982).

The three-way debate in this book *on Dispositions* thus furnishes us with a useful set of landmarks with respect to which theorists may locate themselves, and a large stock of reasons with which to support their many and various interrelated conclusions. There is more overlap than you might initially have expected at the core of the initially contrasting theories of Armstrong, Place and Martin. The book is frustrating, because there are so many arguments in it, going in all sorts of directions, and often the participants are arguing past one another. But it is good to see three opposed theorists listening to one another really hard, and presenting one another's views as fairly and sympathetically as they can. A sympathetic reader of the book can, we urge, distil out of the materials in this book a "meeting of minds" which is never quite reached within the confines of this book, taken by itself. In the book, one can see genuine progress being made on the theory of dispositions, and thereby progress is being made on several of the most central questions of metaphysics.

Why is the theory of dispositions located right at the centre metaphysics, in the latter half of this century? One historical thread behind the centrality of the theory of dispositions traces from an ever-present preoccupation with the mind-body problem. Philosophical behaviourists, influenced by Ryle and the later Wittgenstein, sought a safe passage between the Scylla of Cartesian dualism (everybody's whipping boy), and the Charybdis of materialism (which many perceived as being too shallow to satisfy anyone with any philosophical depth of soul). "The mind" was to be, as you might say, *de-reified*; that is, there was a concerted effort to dispel the illusion that there is a "ghost in the machine", but to do this without thereby "reducing" us to "mere" machines; and in the place of a network of alleged conscious events or processes or properties we were presented with a pattern of behavioural *dispositions*. When dispositions took over the place of "the mind", they fell right into the centre of twentieth-century philosophical concerns. Dispositions are still the building-blocks of the most prominent current theories of mind, such as *functionalism*.

Armstrong, Place and Martin were there at the birth of Australian materialism, and they have been wrestling with dispositions ever since. All three resisted the late-Wittgensteinian and Rylean attempt to de-reify the mind.

Martin nailed a credo to the door which led out of the "death of metaphysics" atmosphere of the first half of the century, and into the vestibule of post-Wittgensteinian metaphysics. "Truths," Martin said, "need truthmakers". If attributions of dispositions to agents are to be *true*, he taught us, then there must be things in the world which *make* those attributions true. Thus, there must be "something going on inside us", to serve as a truthmaker for any attribution to us of the behavioural dispositions which Ryle and Wittgenstein had placed at the centre of the twentieth-century conceptual system. So, Martin bravely insisted, there is a "ghost" in the machine after all; and threatening to label him a "Cartesian" did not frighten him back into line behind the deflationary anti-philosophers like Wittgenstein. Martin was unpersuaded that all events, processes and states, and all the properties of these, are purely "physical" ones. All properties have their own intrinsic character, they are the properties that they are ("in themselves" as it were). Even the most humble of physical properties has its own intrinsic characteristics, its *qualia* as you might say. The mind is no exception. There are, Martin was sure, *intrinsic* properties of the things which go on inside us; but these intrinsic properties are not all, in any useful sense, "physical" ones. They are, as you might say, "emergent" properties but (Martin insisted) this did not entail any kind of supernatural magic in the world.

Armstrong and Place, like Martin, insisted that conscious events and processes do occur, and are located in the causal order of things; but they insisted that these are *physical* events, processes and states which are located primarily in the brain. Conscious events, processes and states do have properties which we can study, but these are all *physical* properties of physical events and processes.

Although Armstrong, Place and Martin rejected what might be called the *bare*-dispositionalism of Ryle, they did not displace dispositions from their predominant position in the philosophy of mind. On the

contrary, they sustained the theory that dispositions are the very heart and soul of consciousness, as made especially vivid in Martin and Pfeifer (1986). Here is one very striking way in which they place dispositions at the heart of the philosophy of mind. One of the most puzzling features of mental states has been what is called their *intentionality*: the fact that thoughts are directed upon objects which may or may not exist. Under this heading a distinction has been drawn between *de dicto* and *de re* propositional attitudes. For instance, there is a difference between a so-called *de dicto* desire "that you eat an egg", and a *de re* desire, concerning some particular egg, "that you eat". It is easy to misperceive this as a distinctive and mysterious consequence of the intentionality which marks out mental life as essentially distinct from anything to be found within the inanimate world of matter. Yet compare the two distilled egg-eating desires with the following two dispositions. A hen may have a disposition to lay an egg (*de dicto* as it were); but if an egg has already begun to form in the ovary, then the hen may also have a disposition to lay it (*de re* as it were). This, Martin argues, is an exemplary case: dispositions possess all the salient features which are traditionally associated with the intentionality of conscious states. This should, Martin and Place urge, demystify the mind. Armstrong, however, misreads the situation and takes this not to demystify the mind but to mystify dispositions. He takes these "marks of intentionality" to be demystified by a reduction of dispositions to their "categorical bases". We will say more about these "categorical bases" below.

Armstrong, Place and Martin inherited from Ryle a philosophy of mind which placed dispositions at the very centre of their theories. What distinguished Armstrong, Place and Martin from Ryle was the fact that those three theorists made dispositions much more "substantial" than Ryle had thought them to be. They construed dispositions as *properties* of things in the world. For Ryle, in contrast, dispositions were conceived as networks of *conditionals*, rather than as attributions of any *properties* of any kind at all, whether physical or mental.

This historical legacy of the debate bedevils it still, in the very terms in which the debate is couched. Armstrong argues that dispositions need a "categorical" basis. Place notes that this term "categorical" has its primary target in the taxonomy of *sentences*, not of individuals, properties or relations. It is a kind of a category mistake to speak of a "categorical *property*". If "dispositions" are conceived by contrast with "categorical" properties then, as Place points out, this carries the unwelcome suggestion that an individual never really, "categorically", has a dispositional property. Dispositional properties are thereby portrayed as metaphysically second rate.

What, indeed, is a disposition? In an (otherwise) excellent introduction, Tim Crane says that it is granted on all sides of the debate that a dispositional property is one whose possession *entails* the truth of a range of *conditionals*. Thus for instance, a thing's being soluble in water entails that if it were put in water then it would dissolve; and that an electron's carrying a negative charge entails such things as that if it is placed near another electron then there will be a force of repulsion between them; and so on. However, this is a misleading way of setting up the problems, and it comes down to us as an unfortunate legacy of the source of the debate in Ryle's philosophical behaviourism. As Mellor (1991) showed, Martin frequently insists throughout the book, and Place and Armstrong acknowledge, the possession of any property will entail the truth of a range of conditionals. So Crane is mistaken to think that we can *define* a dispositional property as one whose possession entails the truth of a range of conditionals.

Furthermore, when you try to spell out more carefully exactly *which* conditionals are entailed by the possession of a disposition, it turns out to be virtually impossible to get the story right. In the first place, there seem to be indefinitely many conditionals which are all entailed by an object's having any given dispositional property (or any given categorical property, for that matter). And yet when you try to spell out any one of these conditionals, you nearly always find that it is simply *not true* that the possession of the relevant dispositional property *entails* the truth of this conditional. Scrutinize more closely, for instance, the hand-waving people engage in when they say that possession of the dispositional property of water-solubility entails the truth of the conditional, "If it were placed in water then it would dissolve". There is no such entailment. As Martin has very forcefully argued, it is possible for an object to be water-soluble and yet for it to be *false* that if it were placed in water it would dissolve. In the first place, we might note that the water

would have to be within reasonable limits of temperature: at the extremes, it had better not be either ice or mist. The object might, furthermore, be placed in a situation which ensures that if it were to be placed in water, it would cease to be water-soluble: the situation might be one in which the object has what Martin has called a *finkish* disposition. Martin has been one of the best at articulating the deficiencies of all existing theories about *which* conditionals are entailed by a thing's possession of any given dispositional property. This is one of those irritating details, or anomalies, which sit in the background for a long time without getting resolved, yet some of which, in the end, force the kind of fundamental change in theory which Kuhn called a shift in paradigm.

The shift in paradigm which Martin pushes for is one which breaks with the traditional way of dividing properties into the two classes of the "dispositional" and the "categorical". All properties, Martin urges, are tied to ranks upon ranks of conditionals in exactly the way which has been salient in our theorizing about dispositions. So all properties have, as you might say, a "dispositional side" to them. Yet all properties also have, as it were, a nature of their own, they "are what they are" as things in themselves, and it is only *because* they are properties "in their own right" that they can serve as truthmakers for ranks of conditionals.

Martin has made real progress in his work on finkish dispositions; and he is onto something very important in his "double aspect" theory of dispositions. The insights he is working around are ones which Place and Armstrong, too, have registered, though in different ways. Armstrong, for instance, argues that there are two ways of identifying a "categorical" property: you can identify it by directly naming it or describing its intrinsic character (as for instance when you describe a shape in rigorous geometrical terms); or you can identify it by citing a range *of conditionals* which will characteristically be true when an object has that property. There are often different ways of referring to one and the same thing. Donald Davidson (1980) impressed many by the use he made of this observation in his theory of the logical form of sentences which describe *events*. When one moves one's finger to flick on a light, then there are not, Davidson said, the various distinct actions of moving your finger, turning on the light, alerting the burglar, and so forth. Rather, there is just the one action described in two different ways. Describing the action as "moving your finger" focuses, so to speak, on the intrinsic, whereas describing it as "flicking on the light" describes the action indirectly, picking out an act which happens to be a cause of various things through reference to one of its *effects*. Similarly, for Armstrong, when something is described as having the dispositional property of solubility there are not the two distinct properties of chemical structure on the one hand, and solubility on the other. Rather, there is just the one property which is described in either of two ways, either as "a chemical structure" or as "a property which would cause it to dissolve in water". Extracted from a historical legacy coming from Rylean behaviourism, and shorn of terminology which sets up a false opposition between Armstrong and Martin, we have something important here in Armstrong's theory which is very close to Martin's double-aspect theory of dispositions.

On one important thesis, therefore, Armstrong and Martin are close to agreement, and they stand out against Place's disposition-dualism. Armstrong and Martin agree that a disposition is a causally active property which can be referred to either by naming or describing its intrinsic nature, or else by describing the conditionals for which this property is a truthmaker. They part company, however, on what we might call the internal structures of these properties.

Armstrong contends that the truthmakers for any relevant ranks of conditionals will *always* have to include the *laws of nature*, alongside the properties which furnish what he calls the "categorical basis" underlying those conditionals. Possession of the basis-properties will never, by itself, entail the required conditionals, Armstrong contends; rather, it is only the *conjunction* of a basis-property with laws of nature which will necessitate the truth of the conditionals. Thus for instance, Armstrong contends that the categorical basis for water-solubility is a chemical structure which is only *contingently* correlated with a substance's dissolving when placed in water. There is no contradiction in a theory which posits different laws of nature from the ones which actually obtain; and in a world governed by different laws of nature the same chemical structure which in our world causes substances to dissolve in water might, under those alternative laws, result in completely different manifestations. Or so Armstrong contends. In effect, he contends that

the truthmaker for relevant ranks of conditionals *always* has to have the form of a *conjunction* of some "loose and separate" property with some collection of laws of nature which will furnish the "glue" which sticks this property onto the conditionals concerning its potential manifestations.

For Martin, in contrast, properties are not utterly "loose and separate", but are always and already "sticky": they do not need to wait upon their conjunction with laws of nature before their possession can entail any of their manifestations. Take care, here, not to overstate Martin's case. Distinguish a weak from a strong Armstrong-thesis. On the weak Armstrong-thesis, some entailments of conditionals by possession of properties are mediated by laws of nature. On the strong Armstrong-thesis, in contrast, all entailments of conditionals by possession of properties, without exception, must be mediated by laws of nature. Martin would, we think, be unwise to contest the weak Armstrong-thesis (and even if he did contest it that would take us into side issues which in the present context can be long postponed). What Martin should contest (in the current context) is, rather, the strong Armstrong-thesis. That is to say, Martin should be understood to be contending that there are some entailments of conditionals by possession of properties which hold *without* requiring those properties to be conjoined with laws of nature. The possession of a property, Martin insists, should *entail something*, whether or not that property is set about with laws of nature. The property "would not be the property that it is" if things had not been thus-and-so. And among the entailed things which must be "thus-and-so" will *be some* conditionals. This is a deep and interesting thesis; and it is hard to see where the burden of proof most falls most heavily – on Martin, or on Armstrong. Martin is saying that properties have essences; Armstrong is saying that they don't, or at least that they don't until they have been conjoined with laws of nature.

It is worth taking both points of view seriously, but we recommend exploring the consequences of Martin's thesis: it is a natural assumption that there will *be some* conditionals which are entailed by possession of properties whether or not they are conjoined with laws of nature, along of course with many *other* conditionals which are entailed only by the conjunction of properties with laws of nature. This is compatible, however, with taking Armstrong's side on some *examples* of dispositional properties. Many salient examples of dispositional properties may be ones which do not entail any salient conditionals unless they are conjoined with laws of nature. For instance, the chemical structure which underlies water-solubility might (arguably) have been the very chemical structure that it is even if the laws of nature had been different in ways that prevented things with that chemical structure from dissolving in water. It is not obvious that this is so; but in principle Martin could concede this much without giving any ground on his deepest insight. He should concede, we think, that on *some* salient examples of dispositions, the laws of nature are required to mediate between possession of the relevant property and truth of a range of associated conditionals. This might (perhaps) be the case for solubility.

Yet compare the dispositional property of solubility with that negative charge. There are conditionals which are entailed by the possession of negative charge, and it is plausible to suppose that at least some of these entailments can as it were stand on their own merits, without mediation from laws of nature. Negative charge simply would not be the property that it is, if it were not associated with repulsive forces between like charges. The law that negative charges repel one another is not something which must be *conjoined* with the possession of negative charge, before possession of that property will entail the existence of a repulsive component force between two negatively charged bodies. Rather, the law is just a *summary* of some of the things which are entailed by the possession of a negative charge. Armstrong could and should, we urge, concede this point; and he can do so without relinquishing some of the most important of his own insights on the nature of dispositions. Again there is room for considerable meeting of minds, before our rival theorists have to hold their ground and simply agree to differ.

Thus Armstrong and Martin can find common ground in a double aspect theory. Properties have both intrinsic natures and entailed conditionals; and when conjoined with laws of nature then they entail even more conditionals. We may then reconstrue Armstrong's thesis that every disposition requires a categorical basis: change your gestalt and this becomes an alternative expression of Martin's double-aspect

theory. But there is still room for Armstrong and Martin to disagree over details, under the umbrella of a shared double-aspect theory.

When Armstrong says every disposition needs a categorical basis, what he has in mind as a categorical basis is a congeries of primary properties like *shape*. The neat thing about shape, as a property, is that its intrinsic character is both *epistemically* and *semantically* accessible to us. We can not only name it, we can also learn a lot about it, and articulate complex and explanatory descriptions of what this property involves. Consider for instance a sharp knife. Its sharpness is constituted by its *shape* and its *hardness*. And its shape can be given illuminating and complex geometrical characterizations. As Martin says, there will be conditionals which follow of necessity from its shape and hardness. We do not have to wait upon the mediation from laws of nature, before we can find out whether a sharp knife will cut things which are not as hard as it is: if it didn't cut then it wouldn't have that property. So one way to refer to the shape of a sharp knife is by an indirect route, by way of the conditionals which follow from a thing's possession of that shape. Yet the very same property of shape can also be described as it is in itself, directly, without indirect appeal to the various characteristic conditionals for which it furnishes a truthmaker. When Armstrong asks for a categorical basis for every disposition, there lies behind this a bold metaphysical thesis that *the only* properties which exist are ones whose intrinsic character can be articulated in the way we can see exemplified in the case of so-called primary properties like shape.

This bold metaphysical dream is hard to sustain, however. Take for instance the sharpness of a knife. This is constituted by its shape and its hardness. Its shape is a property whose intrinsic nature can be articulated in detail; but when we engage in this articulation we will find that it must eventually "bottom out" in properties and relations which we can name, but for whose intrinsic natures we can give no explanatory description. And the *hardness* of the knife is resolved relatively quickly into such things as the repulsive forces between *electrical charges*. And it is hard to articulate the "intrinsic character" of a fundamental physical property like that of possessing a negative charge. When various philosophers set themselves in opposition to Armstrong, over his claim that all dispositions have categorical bases, part of what drives them is a lesson they learn from physics. The fundamental properties in physical theory are often ones which we can name, and ones which we can refer to indirectly by way of the characteristic conditionals for which they provide truthmakers; but very often they are *unlike* the property of shape, in that (as far as we can tell) it is *impossible to* articulate anything useful about their "intrinsic natures". All we can say about them is that they are the properties which serve as truthmakers for such-and-such conditionals. Martin insists that these properties do have what we might call an intrinsic character; but we think it should be allowed that there are some fundamental properties about whose "intrinsic characters" which we can say very little. It might be an overstatement to say they are "ineffable", but it comes close to that.

Martin's resistance to Armstrong begins with the intrinsic natures, or *qualia*, of physical properties. And it generalizes to the *qualia* of mental states. Here, there is room for sharp disagreement between Armstrong and Martin. Conscious states have properties which Martin may take to be primitive non-physical properties, whose intrinsic natures can be named and referred to indirectly by way of their effects, but which cannot be articulated as they are "in themselves", or at least whose intrinsic natures cannot be articulated using the tools provided by geometry, mathematics, and physical theory. Armstrong, in contrast, may take all of these to be complex physical properties, whose intrinsic natures can be articulated in the ways which are possible for primary properties like shape. Armstrong wants all properties to have intrinsic characters which can be described as they are in themselves, so of course this will apply equally to the *qualia* of conscious states. We resist Armstrong's general requirement on all properties; but we would share his scepticism about whether the *qualia* of conscious states are to be taken as primitive in the ways that fundamental physical properties like charge are. Nevertheless, we urge, Martin's work on dispositions can help us all to see disputes about the intrinsic natures, or *qualia*, of properties under a more general light, whether we side with Martin or with Armstrong over the special case of the *qualia* of conscious states.

Agreeing with Martin as far as we do, over his double-aspect theory that all properties have both a dispositional and an intrinsic side, we nevertheless side with Place against Martin and Armstrong over

something else. Every property has both a dispositional and an intrinsic side to it; but not all properties are *first-order* ones. There are properties like shape and charge. But there are also *higher-order* properties like the following two:

- the property of being such that such-and-such conditionals hold.
- the property *of having* a property which *makes* such-and-such conditionals hold.

Call the first of these *thinly dispositional*, and the other one *thickly dispositional*.

Ryle's philosophical behaviourism aimed to de-reify the mind by construing mental states as thinly dispositional properties. Consider, then, the following thesis: that something can have a thinly dispositional property *only* if it *also* has a thickly dispositional property. And then, if it has a thickly dispositional property then it must also have the *further* property which "makes" the relevant conditionals hold. The insistence that any thinly dispositional properties be grounded in thickly dispositional properties thus picks up much of the spirit of the Armstrong thesis that dispositions all need a "categorical basis". Is it a *necessary* truth that thickly dispositional properties *always* must be underpinned by thickly dispositional properties? When you get down to the fundamental properties of physics, like that of being negatively charged, it is not obvious that we will always be able to distinguish the thinly from the thickly dispositional properties of subatomic particles. Nevertheless, it is very plausible that Ryle's thinly dispositional *behavioural* properties of *human beings* are all underpinned by thickly dispositional properties, and hence also by "categorical bases".

There certainly are two kinds of *predicates* (or *open sentences* or *descriptions*) of the thinly and thickly dispositional forms described above. It might be disputed whether these *predicates* correspond to any *properties*, properly so-called. There is, however, a kind of argument to the best explanation which can support the theory that there are properties corresponding to these predicates, a "unity argument": often appeal to higher-order properties of this kind can serve explanatorily to unify a diverse range of phenomena. For example in evolutionary theory the concept of *fitness* of an organism is an integral part of evolutionary theories of great explanatory power; yet the properties which account for an organism's survival on any given occasion will vary enormously from case to case. And, arguably, fitness is a higher-order property of being such that such-and-such conditionals hold concerning the range of environmental variations over which an organism will survive and reproduce. Place does not draw a link with biological sciences, but he does sketch a kind of "unity argument" in connection with artifacts like motor car engines. Horse-power is the example he mentions. Place argues for the existence of properties like horse-power, and he calls these *dispositional* properties. We suggest that one way of clarifying his theory is by identifying these "dispositions" with the thinly and thickly dispositional, higher-order properties we have described above.

Place thus argues against Armstrong's identification of dispositions with their "categorical bases". In addition, on pp. 118-119 he presents a very interesting additional argument against the identification of dispositions with their categorical bases: a *cardinality argument*. He argues that the categorical properties are few, whereas the dispositional properties are many: the set of dispositional properties has a higher cardinality than the set of categorical properties upon which they are based. That is, there is no one-to-one mapping of categorical properties onto dispositional properties, Place argues. This argument is not quite rigorous yet; but it is worth exploring further. Arguably, the set of conditionals which can be constructed upon any given class of first-order properties will have the cardinality of the set of subsets of that given class of first-order properties. So, Place argues, the dispositions which are grounded in those first-order properties cannot be placed in one-to-one correspondence, and hence cannot be identified with, the first-order properties which provide their categorical bases. By identifying dispositions with *higher-order* properties, we do not face the same objection. We suggest that it helps to clarify Place's core thesis, if we identify dispositions with higher-order properties.

Though we find Place persuasive in his arguments for a disposition-dualist thesis, there are some aspects of his dualism which we find unpersuasive; and in particular, we are unpersuaded by his reasons for maintaining that there is causal interaction between dispositional properties and their categorical bases. This

causal thesis would be easy to sustain if all there were to causation was counterfactual dependence – that is, if all that was required for one event to count as a cause of another is just for it to be the case that "without the first, the second would not have occurred". Place does hold this counterfactual theory of causation, echoing Hume's *Enquiry* (Section VII, Part II, Paragraph 60) and Mackie (1962,1974) on this score; we think also of Lewis (1973). Against this background it is easy to see why Place believes there to be a causal relation between dispositions and their categorical bases: often it is the case that "without the one, there wouldn't be the other". We certainly agree with Place that there are no dispositional properties without any first-order properties to underpin them (no Rylean "magical" dispositions without any first-order truthmakers). If counterfactual dependence were all that was required for causal connections, then Place would be right. Certainly the presence of counterfactual dependence does generate "causal explanatory" relations between first-order and higher-order properties: for instance a thing can be said to be fragile *because* it has certain first-order properties, in one very salient sense of "because". But there are two reasons why we disagree with Place's claim that there are causal relations, properly so-called, between dispositions and their categorical bases.

First, we take it to be agreed that cause and effect need to be two distinct events. In objecting to Lewis's counterfactual theory of causation Kim (1973) pointed out that it may be the case that "if he hadn't written 'r' then he wouldn't have written 'Larry'", yet it is not the case that the writing of 'r' *caused* the writing of 'Larry'. This is because writing 'r' *is part of* what it is to write 'Larry'. Likewise the having of first-order properties does not *cause* the having of corresponding second-order properties, because these properties are logically interconnected in ways which preclude one being a "cause" of the other.

The second argument against Place's causal thesis builds on the thesis that causal relations, properly so-called, involve something *meatier* than counterfactual dependence, something like the action of forces, or conserved quantities in physical interactions – loosely speaking, *biff*. We will not argue here for this view on causation, but we note that this would provide an additional reason for resisting Place's thesis that there are causal relations between dispositions and their categorical bases. There is no biff connecting first-order properties with corresponding higher-order properties, or between dispositions and their categorical bases. For these reasons we part company with Place over his thesis that there are causal relations between dispositions and their categorical bases. But he does make out a good case for the dualist thesis, of a distinct existence of both (first-order) categorical properties and (higher-order) dispositional /properties.

Accepting Place's dualist thesis, however, does not force us to abandon the Martin dispositional double-aspect thesis, that all properties have both an intrinsic and a dispositional "side" to them. All properties are linked, as a consequence of their intrinsic character, with ranks of conditionals of various sorts. This applies to higher-order properties just as much as it does to first-order properties.

There is a significant potential for overlap in the views of Armstrong, Martin and Place on dispositions. That is, each can find a way of saying at least some of the things which lie closest to their heart in ways which the others *could* accept without undermining anything central to their own theories. It can help to clarify the positions of all three theorists if we keep in mind Martin's very helpful "double aspect" insight, that all properties have both their own intrinsic natures, but their possession will also entail at least some conditionals. It will also help if we keep in mind the thesis, whether we accept it or not, that there are such things as thinly and thickly dispositional, higher-order properties; and this captures much of the spirit of Place's disposition-dualism. And it will further clarify our thinking about such matters if we keep in mind the thesis, whether we accept it or not, that all thinly dispositional properties are underpinned by thickly dispositional properties (at least in the case of the behavioural dispositions of human beings); and this captures much of the spirit of Armstrong's disposition-materialist thesis that all dispositions need a "categorical basis".

Return to the three examples of properties that we began with: solubility, negative charge and spherical shape. Some substances are soluble "because" they have a certain crystalline structure. These properties of solubility and crystalline structure are distinct, the former being a higher-order property than

the latter, and they have different intrinsic characters. Yet each is linked to a set of counterfactual conditionals, each has a "dispositional side" to it, as well as an "intrinsic character."

In the case of spherical shape, we have a property with an intrinsic character, and again there will be associated, entailed, conditionals; but *being spherical is not* the higher-order property of "being such that those conditionals hold". That is why being spherical is not a dispositional property.

For the property of negative charge, the jury is still out: when we speak of this property, we equivocate between reference to a first-order property, and reference to the higher-order property of "being such that such-and-such conditionals hold". It is unclear whether science will ever reveal anything about the intrinsic character of the first-order property of negative charge which explains why possession of this property supports the many and varied conditionals it does. So in the case of fundamental properties like being negatively charged, it becomes difficult to know whether such properties are "dispositional" or "categorical": the distinction between them becomes metaphysically slender, epistemically inaccessible, and semantically elusive.

We strongly recommend this book on *Dispositions*. Each of the three participants provides very persuasive arguments for different parts of the full story which we seek concerning dispositions. The many arguments in this book can help to draw a reader, as they have drawn us, very much closer towards a satisfying understanding of some of the deepest and most central problems in metaphysics.

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