Determining the Mental-to-Physical Relationship

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Abstract

Stephen Yablo suggested that the relation of mental properties to physical properties is the same as that between red and scarlet: one of determinable property to determinate property. So just as being scarlet is a specific way of being red, on Yablo's proposal a subject's having a certain neurological property (c-fibres firing, say) is a specific way of a subject's having a certain mental property (pain, in this case). I explain the virtues of this theory, in particular as defended and developed by Jessica Wilson, but raise some problems for it. I then describe a novel theory of the mental/physical relationship, which inverts the Yablo-Wilson proposal. On this theory mental properties, notably phenomenal properties – or, as I will say, qualia – are determinates of determinable physical properties. I explain the virtues of this view, and argue that they at least match, and plausibly exceed, those of the Yablo-Wilson theory. In particular, this new theory is able to account for certain prominent perplexities of the mind/body problem that tend to go unexplained. I distinguish the view from nearby theories, in particular the increasingly popular 'Russellian monism'. I end by likening it to a recent interpretation of Aristotle's philosophy of mind due to David Charles.

1. Introduction

Philosophers are ever on the lookout for fruitful new ways to construe the relationship between mental and physical properties. Arguably, never has this hunt been more intense, nor generated more discussion, than in the last several decades of research. Into this context stepped Stephen Yablo, with the ingenious proposal that the relation of mental properties to physical properties is like that between red and scarlet: one of *determinable* to *determinate* property. So, just as being scarlet is a specific way of being red, on Yablo's (1992) suggestion a subject's having some particular neural property is a specific way of a subject's having some particular

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mental property.[1] For instance, the mental property *pain* might be a determinable and the physical property *c-fibres firing* one of its determinates (the one that humans, as opposed to octopuses, instantiate, say). In that case, having your c-fibres fire is nothing more nor less than a specific way of being in pain.

Yablo's proposal about the mental-physical relation had two important virtues for physicalists. First, physicalists commonly hold that the mental is multiply realisable by the physical, and the logic of multiple realisability seems well captured, or mirrored, by the determinable/determinate relation. For pain, if it is a determinable property, can have physical determinates other than c-fibres firing: firings of other sorts of fibre, or whatever else, in different individuals and species, who likely instantiate pain in different ways to humans. Relatedly, determinates *asymmetrically necessitate* their determinables: thus a scarlet thing must be red but a red thing need not be scarlet. Hence any creature with a specific neural determinate of pain would be in pain, but a pained creature need not have any specific neural determinate of pain. So, the determination relation seemed aptly to model the widely endorsed multiple realisability of the mental by the physical.

The second and most important virtue of Yablo's proposal, however, concerned mental causation, and the longstanding worry that, on the assumption that the physical realises the mental, the ubiquitous availability of physical explanations for physical happenings leaves nothing left for the mental to do, rendering mental properties explanatorily redundant and epiphenomenal. So if one's pain is physically realised, then the physical explanation of one's pained behaviour – in terms of neurological events and muscular contractions – might seem to screen off, and render redundant, any explanation in terms of one's being in pain as such, with the counterintuitive result that one's being in pain does not help to explain one's behaviour. Responding to this worry, Yablo argued that determinable and determinate properties, though non-identical, do not compete for causal efficacy, and seemed thereby to make available a possible logic of mental causation. When, in Yablo's example, Sophie the pigeon, who has been trained to peck red things, pecks a scarlet patch, there is a sense in which she pecks because the patch is red, *and* because it is scarlet, since its being scarlet in fact determines its redness – i.e. its being red in the event is a matter, more

[1] See also Macdonald and Macdonald (1986).

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specifically, of its being scarlet. Due to the tightness of the determinable/determinate relationship these do not seem to be competing explanations of Sophie's behaviour.

A further pleasing consequence of Yablo's model is that one might even think the determinable property takes precedence in certain explanations. For the causal powers, or features, of scarlet in virtue of which Sophie pecks are whatever powers or features it shares with other shades of red, given that Sophie is trained to peck *red things*. It is, thus, arguably, the patch's redness that matters most. On this understanding, it is because the scarlet patch is red that Sophie is led to peck. Transposing to the mental-physical case, mental properties, as determinables, would seem to have their distinctive causal efficacy happily safeguarded. It would genuinely be because you were *in pain* that you winced, with the determinate neural realisation of your pain arguably mattering if anything somewhat less in the wince's production. For, presumably, another relevantly similar neural property would have had the same effect, providing it was also a determinate of the relevant sort of pain.[2]

Yablo's elegant and powerful theory about the relation of mental and physical properties has drawn much attention, and, naturally, objections. Generally these allege that the mental-physical relationship lacks certain hallmarks of the determinable-determinate relationship. In turn, Yablo's model has been ably defended against a selection of such objections by Jessica Wilson (2009).

I will not enter directly this debate over the viability of Yablo's proposal, though I will raise a problem for Wilson's elaboration of it later. Despite that problem, Yablo's theory still demands our attention when considering ways that the mental and the physical might satisfactorily be taken to relate. What I wish to do, mainly, is to put forward a related proposal, which is most easily arrived at by *inverting* Yablo's view. The idea, then, is that it is mental properties, specifically phenomenal properties, or, as I will say, qualia, that are the determinates, and physical properties, e.g. neurological properties such as c-fibres firing, the determinables. On the resulting picture, roughly, it is the mental that determines[3] the physical,

[2] More precisely, Yablo argues that mental determinables and physical determinates do not compete for causal relevance, but do compete as to which is *the* cause, and that the mental determinable usually wins, being more 'proportional' to the effect (Yablo, 1992, §8). This detail will not generally matter below, so I bracket it for now.

[3] Talk of determination is commonly used to mean one property's fixing another, e.g. when discussing supervenience relations. Determination

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and having a particular quale is a specific way of having a physical property.

First (§2) I explain some key notions, allowing me to detail Yablo's view and Wilson's development of it. This enables me to state the position I propose by comparison with the Yablo-Wilson view, in sketchy terms initially. I use this sketch (§3) to draw out some notable formal features of the model, and certain interesting explanatory upshots of these features. Following this (§4), I try to put metaphysical flesh on the bones, by explaining what the formal sketch might amount to in reality. This involves a comparison with fashionable 'Russellian monist' theories of mind (§5). In the final section I compare the novel proposal to Yablo's, and suggest its virtues are at least as great, and plausibly greater, than those of his view. So, since his view demands our attention, so does this new view. To be sure, the two theories do not completely match up, despite being mirror images: there are things Yablo's theory captures that mine does not, and *vice versa*. My main aim is not to defeat Yablo's view, nor to offer a rival that captures all and only the same data. Rather, my intention is to advance (what seems plausibly to be) a new metaphysics of mind, and offer it for the usual forms of criticism and elaboration – the sorts Yablo's own view has received. It is just that the most informative way to explain my theory, and what it has going for it, is by comparison with Yablo's view.

2. The Yablo-Wilson View

Wilson (2009, p. 152) lists the following features as characteristic of the determination relation:

- Increased specificity (for something to be scarlet is for it to be red, in a specific way).
- Asymmetrical dependence (anything scarlet must be red, but something red might not be scarlet).
- Necessary determination of determinables (anything red must be a specific shade of red).

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here has a more specific meaning, concerning the relation of determinates to their determinables. Determinates plausibly determine – fix – the presence of their determinables in the first sense, too. But, unless otherwise specified, I always intend the latter sense of determination. See also Wilson's characterisation below.

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- Necessary exclusion of determinates (anything red can only be one specific shade of red (all over)).
- Comparability of same-level determinates (shades of red can be ordered or compared).
- Irreflexivity, asymmetry, and transitivity (increases in specificity are irreflexive, asymmetric, and transitive).
- No causal competition (determinables and determinates do not causally compete).

Objectors to Yablo often argue that the mental-physical relationship lacks some such feature.[4] But Wilson observes, in Yablo's defence, that there is no clear reason why the mental-physical relationship must *exactly* model, say, the way determinable colours relate to their determinates. The project, rather, is to develop an intelligible, viable, and fertile formal model of the mental-physical relationship via the determinable/determinate relationship *broadly* conceived. In this spirit, Wilson (2009, p. 152) isolates the following feature as central to determination: 'Property P determines property Q [. . .] only if for something to be P is for it to be Q, in a specific way'.[5]

Another thing worth noting about the determinable/determinate relation is its relativity: a property can be a determinate relative to a second property and a determinable relative to a third. For example, *red* is a determinate of *coloured*, but a determinable of *scarlet*. But plausibly this process bottoms out, so that there are properties that cannot become any more determinate; these would be *fully* specified properties, which are not determinables of any further properties. Eric Funkhouser (2006) labels such properties 'super-determinates'. His primary example of super-determinates is colours, specific shades of which do not seem to admit of any further determination. There is no obvious sense in which the shade *carnelian red*, for instance, could be further specified, or said to range over a series of further determinates. It seems, rather, to be, already, fully specific, fully determined.

Now, arguably, Funkhouser's claim that colours offer good examples of super-determinates is most plausible if we understand it to apply particularly to *mental colours*, by which I mean those properties directly involved when we have conscious colour experience; otherwise known as the *qualitative characters* distinctive of colour experience – sometimes called mental colour qualities (Wilson labels

[4] See e.g. Ehring (1996).
[5] *Cf.* Yablo *op. cit*; see also Funkhouser (2006).

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these properties 'color appearance properties'). These are the 'aesthetically interesting' colours, in Wilfrid Sellars's (1971, p. 408) phrase, and the properties Bishop Berkeley (1713) insisted were the only proper referents for colour terms. If we consider, instead, 'physical' colours, properties such as surface textures or reflectance profiles, the claim of super-determinacy appears less convincing. For there is no clear sense in which some described surface texture of an object, of a green apple, say, is a maximally specific property. Rather, it seems that we could always specify it in *further* detail, by descending to lower levels of physical constitution. There are surely multifarious, perhaps unending, ways of realising a given light-reflecting surface texture, depending on whether physical micro-constitution has a bottom level or not – i.e., lower-level physical differences that would make no difference to the light reflecting, or to the colour perceived. All these lower-level physical properties would thus count as further determinates of the relevant physical colour. This property is therefore not plausibly a super-determinate.[6] Someone might say that at least *in principle* the relevant micro-physical descriptions could be given in maximally specific – not further specifiable – microphysical terms. But in practice this is not even attempted, and, more importantly, this is not what anybody means by talking about physical colour properties. That is because our visual systems, whose reactions scientific colour theory is geared to, are not sufficiently sensitive that these maximally fine-grained physical properties, if such there be, could be relevant to the specification of perceptible physical colours. Therefore, when we talk of colours as super-determinates this is arguably best understood as making reference to *mental colour qualitative characters*. And these will be paradigmatic of what I mean by the term 'qualia'. Unlike the common usage of 'qualia', however, I will not *build in* that such properties must be consciously experienced – it is left open that there can be *unconscious* colour qualia, as, perhaps, in blindsight; analogous to coloured film-reel without the projector's light shining through it.[7] Mostly this qualification about how I understand qualia will not matter, although it will spawn an interesting variant of my positive theory later.

Taking these points together: It is plausible that colour qualia, and, as long as the point about them generalises, qualia as a class, are

[6] *Cf.* Funkhouser, *op. cit.*, p. 566.
[7] The image is Stubenberg's (1998). See also Coleman (2024).

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good examples of super-determinate properties.[8] Indeed, it might seem hard on reflection to think of clear-cut examples of super-determinates other than qualia. And this may well explain why it has so often been observed by philosophers that qualia have a certain striking 'specificity' or 'individuality'.[9]

Precisely this feature of qualia has furnished an important argument against Yablo. Objectors note that mental properties, particularly qualia, seem not to admit of any further determination. Recall a recent pain you experienced, for example. In my case I can think of a sordid migraine I had for several days last week. Now, considering your recollection of the particular pain you suffered: Does it seem right to say that that qualitative property was only a *determinable*, relative to various further specifications qua pain? Was it not, rather, *fully realised*, fully real, specific, and complete, as a pain, just in your experiencing of it? What could it mean to suggest that you experienced only a *determinable*, hence indeterminate, pain property? If you agree that these questions are not really appropriate, you may find yourself agreeing also with Yablo's objectors that, since they cannot be further determined, qualia are not determinables.[10] And if they are not determinables, then qualia cannot be determinables of physical determinates. Yablo's theory would fail.

But Yablo's theory is not so quickly dispensed with. For Wilson has devised an inventive response to this objection – one with far-reaching ramifications, around which the rest of the discussion will be structured. Wilson's reply is effectively that the objection begs the question. For if something like Yablo's suggestion is correct, then there exists a dimension of determination such that for a given mental property, a pain or colour quale, as in our examples – e.g. an

[8] Notably, commentators also often invoke pains, among other kinds of qualia, as plausible super-determinates.

[9] For some, of many, consonant descriptions of this feature see: Loorits (2014), Unger (1998), Nagel (1974), Russell (1927a), and Chalmers (1996).

[10] Ehring, *op. cit.*; see also Funkhouser *op. cit*. Though Wilson, below, in effect grants the point, some might claim we can experience determinables, e.g. determinable colours in peripheral vision. Perhaps, indeed, peripheral vision *represents* determinable external colours, but I am among those who find it hard to understand the possibility of *experiencing* a determinable (without experiencing a relevant determinate): that is, a merely determinable qualification of conscious experience. Vagueness or indeterminacy of represented content need not imply lack of determinacy in experience itself. Still, my positive view hangs on the claim that qualia *can be* super-determinates, not that they always must be.

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experienced carnelian red or instance of migraine pain – it *can* in fact be further determined, *by adding detail in physical terms*.

Here is Wilson's idea. Just as a colour, given only a specification of its brightness and saturation values, is *indeterminate*, and hence capable of further filling out and determination by the addition of a particular hue value, just so, Wilson's suggestion runs, a pain quale could be supplemented, and precisified, by adding a physical, e.g. neurological, value to its profile. Thus, in principle, one and the same qualitative *feeling* of pain, i.e. as it presents itself subjectively to the experiencer, could be further specified by two *distinct* neurological properties, yielding two different determinates – just as different hue values added to the brightness and saturation profile above would yield different determinate colours. The upshot of the analogy with colours and their dimensions, according to Wilson, is that a quale such as pain should be understood to have qualitative determination dimensions, concerning how it feels, but also at least *one additional physical dimension*, in virtue of which it indeed admits of further specification – hence determination. From the introspective, or psychological, point of view, then, what would appear as two identical property instances might in reality be, given the added perspective of neuroscience, distinct determinates of pain. These two determinates would have the same qualitative value, but distinct physical values. In this way, the physical could seemingly still make the mental more determinate, thereby preserving the spirit of Yablo's theory.[11]

So far I have explained the determinable/determinate relation, spelt out the notion of super-determinates, and detailed the Yablo view as developed by Wilson. I also raised the idea that qualia are super-determinates. Next I begin describing the view I want to propose.

3. A New Model and its Consequences

What I ultimately wish to propose is that qualia are the true super-determinate properties, relative to merely determinable physical properties (as traditionally conceived). In this section I invoke the formal features of this model to show how it accounts for some

[11] Wilson's line allows her to say, regarding metamerism, where physically distinct colours occasion indistinguishable colour experiences, that these experiences nonetheless involve different 'color appearance properties'. She draws the moral that 'Psychological determinables may have explicitly physical determination dimensions' (*op. cit.*, pp. 162–63).

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notable perplexities of the mental-physical relation. In the next section I move to metaphysical interpretation of the model. Readers should not worry that at this point they do not feel they know what I mean by this proposal in concrete terms. We focus for the moment on the model's formal features as sufficiently interesting, and as an approach to the metaphysics. Like a canny car-dealer, I will try to sell you the merchandise on its merits before you get a proper look at it. What follows is a list of well-known perplexities associated with the mind/body problem, especially the problem of consciousness, and explanations of the ways my model predicts or explains them. If these perplexities are the 'footprint' of consciousness, then a theory that predicts or explains them has a good claim to disclose the true form of the mysterious foot in question.

Perplexity 1: Mental Causation

If Yablo's model helps to safeguard mentality against causal exclusion worries, on the grounds that determinates and determinables do not compete for causal efficacy, then the same must be true of my proposal, which simply reverses the terms in the determination relation. However, I will revisit this issue later, since framing physical properties as the determinables has further interesting upshots depending on one's view of the status of determinable properties.

Perplexity 2: Anti-Physicalist Arguments

Since colour-deprived superscientist Mary knows all about the physical properties involved in seeing red yet cannot work out what it is like to see red, many philosophers infer that qualia are non-physical properties, wholly distinct from physical properties.[12]

But if physical properties as traditionally conceived are in fact only determinables, of which qualia help to constitute the superdeterminates, then it is relatively easy to explain why Mary's physical knowledge does not enable her to know what it is like to experience red. Moreover, we can explain this without implying that the redness quale Mary eventually experiences must be considered wholly distinct from the relevant physical property she already

[12] Jackson (1982). My theory has something to say about zombies, too, but that awaits comparison with Russellian monism (§5).

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knows about. The reason is simple: generally speaking, one cannot derive knowledge of a determinate property from any amount of knowledge of relevant determinables.

On the present hypothesis, Mary's traditionally physical knowledge would be in wholly determinable terms, and the fully determinate form of her target property would comprise the specific quale of redness she only experiences when she leaves her room. It follows, given the aforementioned general point about deriving knowledge of determinates from knowledge of determinables, that her physical knowledge does not allow her to arrive at complete knowledge of phenomenal redness. One can no more derive the knowledge that a certain shape is isosceles, say, purely from the information that it is triangular, or from *any* quantity of information at that more determinable level. Nor, similarly, can one derive that the patch Sophie pecks is scarlet from the information that it is red. And so on.

There exists, then, a species of *explanatory gap* between determinables and their determinates. Even assuming that a certain determinable exists concretely in, or alongside, the instantiation of a particular determinate, still this metaphysical unity does not show up in parallel form in the epistemic realm. Given knowledge only of the determinable (i.e., knowledge framed in determinable terms) one cannot infer the determinate type involved in one of its concrete instantiations. Hence, one may know or reasonably believe that a certain determinable is instantiated, but be unable to know the specific form of its instantiation.

But, crucially, *this* explanatory gap implies no radical separation among the properties involved.[13] Because phenomenal red on this view determines a determinate of the relevant physical property (*viz*., the property Mary already knows about), it is *also* plausibly a physical property – on the grounds that a determinate of a property of type T is also, in general, a T property. Compare: being isosceles and being triangular (being isosceles is also a 'triangle property'), or being triangular and being shaped (being triangular is a shape property). Moreover, the determinable property is plausibly *part of the nature* of the determinate, as both are instantiated: as a determinable is instantiated it is included in the being of the determinate actually instanced, just as red is plausibly 'present in' scarlet, in an admittedly somewhat elusive sense.[14] It is only via the instantiation

[13] Compare with that highlighted by Levine (1983).

[14] There are ways of making this sense less elusive, e.g. in terms of subsets of powers or proper parts of property spaces (Wilson *op. cit*.).

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of the determinate, in fact, most agree, that the determinable gets to be instantiated.

Hence, overall, the epistemic gap Mary faces is explained in a fairly mundane way that implies no grand metaphysical gap. Further, Mary's epistemic gap derives from a *general feature* of properties, not from anything special about the mental-physical property relationship in particular. This is a pleasing result, for those keen to do justice to the mental *qua* mental while avoiding dualism.

Perplexity 3: Acquaintance

It has often been claimed that qualia are an unusual, perhaps unique, sort of property in that full knowledge of them requires a direct cognitive relation of 'acquaintance'. Physicalists can be reluctant to acknowledge acquaintance, since it seemingly makes trouble for naturalism.[15] Conversely, anti-physicalists sometimes wield acquaintance in their cause, based on introspective evidence for the acquaintance relation. But on the present model the need for acquaintance would be an intelligible, and uncontroversial, consequence of the fact that traditional physical properties are determinables, with qualia their determinates, and of the point noted above, that no amount of information in more determinable terms suffices for grasping a determinate property.

Given these two facts it would follow that to know the nature of a quale requires knowing more than what would be revealed by third-person investigation of traditional physical, merely determinable, properties. Hence, one might well expect, only direct knowledge of the determinate property, the quale itself, would suffice. To be sure, my account does not *imply* the need for acquaintance, at least not in a straightforward way. But given that the relevant kinds of knowledge available to someone in the situation of Jackson's Mary would appear to be limited to (i) factual knowledge gained by scientific, third-person investigation, (ii) know-how, as invoked by David Lewis, and (iii) knowledge from direct acquaintance with the relevant quale, it would seem, by elimination, that only acquaintance will do. For Lewis-style know-how, the other alternative, is invoked precisely to

[15] Though some have tried to use acquaintance to protect physicalism against Jackson's Mary and other such threats; see e.g. Conee (1994). *Cf.* Coleman (2019).

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deny that Mary-style knowledge is knowledge, in a robust sense, about the *property* or quale of phenomenal red.[16]

More precisely, knowledge of a quale would require knowledge of a property or properties *at the same determinate level* as the target. That means either i) knowing the quale itself, directly, which is what we call acquaintance, or ii) knowing another determinate quale or qualia from which knowledge of the target quale might be inferred. And it does seem that knowledge of a quale can be inferred from knowledge of other same-level qualia, as with extrapolating Hume's missing shade of blue.[17] In fact, here we have a nice explanation of why such inferences are possible, while inferences from physical knowledge to qualia are not – which further supports the suggestion.

But again, the thesis that acquaintance is an appropriate mode of knowledge of qualia would, on the present scheme, in no way imply that qualia are non-physical, or wholly separate from physical properties. We have already noted that if qualia provide determinates of physical properties then the presumption is that they are themselves, in a good sense, physical properties.[18] Rather, the key role of acquaintance would be only another mundane, albeit interesting, upshot of the thesis that qualia determine determinable physical properties.

Perplexity 4: Objectivity/Communicability of Physical Science

It is a striking fact, and one much remarked upon, that whereas for qualia a subject must experience them[19] to know them fully, as regards traditionally conceived physical properties these are, by contrast, intelligible in principle *regardless* of the experiences the

[16] See Lewis (1990).

[17] Similarly, knowing about isosceles and equilateral triangles, one could plausibly infer the properties of scalene triangles.

[18] A reviewer notes that this is not guaranteed: what if God got involved in determining a property, wouldn't that suffice for the determinate to be non-physical even were its determinable physical? Perhaps this sort of thing can occur: I cannot see how to rule it out. Yet, absent good reason to think otherwise, the *presumption* will be that a determinate of a physical determinable is itself physical.

[19] Or, as mentioned, nearby same-level determinates, as with Hume's blue.

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investigating subject has.[20] There is no bar to a blind, a Martian, or a super-intelligent bat scientist's possessing all Mary's pre-experience physical knowledge about colour. But, as Nagel (1974) notes, humans cannot know what bat echolocatory qualia feel like.

The proposal that traditional physical properties are determinables, and that qualia provide their super-determinates also explains this fact. For determinables can be grasped via knowledge of a wide range of determinate properties. To grasp triangularity, it suffices to be acquainted with an isosceles triangle, or an equilateral one, or a scalene (or any more determinate forms of these). The reason for this is, plausibly, that the determinable *triangle* is equally 'present', hence graspable, in each of these determinately distinct forms. Carrying over the analogy, it will follow that traditional physical properties, as determinables, are in principle graspable by creatures having qualitatively very different determinate experiences. Just as someone with exclusive experience of isosceles triangles (or even of a specific isosceles triangle), and someone with experience exclusively of equilateral triangles are equally well placed to investigate the determinable 'triangle', so creatures with quite different sorts of determinate experiences will be equally well placed to investigate, and to grasp, the determinable property that corresponds, on the present account, to the traditionally conceived physical nature of their specific experiences, or of experience in general. As with being isosceles and being triangular, a given traditional physical – determinable – property might be equally present, hence graspable, in determinately distinct and irreconcilable experiential forms, such as those of human beings and those of super-intelligent bat scientists. This is another epistemic difference between the mental and the physical that has often been taken to indicate a metaphysical chasm; but it is once more explained by the determination relation without opening any such chasm.

That the new theory explains or predicts these standardly perplexing features of the mental-physical relationship may be taken to constitute quite good abductive support for it.

4. The Metaphysical Picture

But what sort of metaphysical picture results, concretely, from construing the mental-physical relationship as suggested? Various options seem open, which turn partly on how one understands the

[20] See e.g. Alter (2023, Ch. 1), Coleman (2022b).

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determination relation. What follows is one possible story, based on reversing the Yablo/Wilson view, which I will continue to employ as a stalking horse.

Funkhouser usefully construes determination as occurring along *dimensions* that a property type has, on the model of colours, which are determined along the hue, saturation, and brightness dimensions. Importantly, for present purposes, a property's dimensions can be taken as *essential to*, and individuative of, the property kind: thus colour has different dimensions to smell, shape to mass, and so on. Conversely, any property with the very same dimensions as colour would simply *be* colour.[21]

Thinking this way, a specification of a brightness and saturation value-pair is not fully determinate, does not yet specify a full-blown colour *shade*, but needs supplementing with a particular hue value. We can, following Funkhouser, construe the colour dimensions as framing a *property space*, with the region bounded by hue, brightness, and saturation corresponding to the determinable *colour*, and that region bounded by a more specific *range* of values on each dimension corresponding to the determinate colour *red*, say. Within the red space, once a specific triple of values is fixed we have a *point* in the colour property space – a super-determinate, fully specified, *shade* of red such as carnelian.

For mental properties, as noted, Wilson suggests that a quale like pain has a physical – presumably neurological – determination dimension. This means that two pain instances identically located on the axis (or axes) of qualitative character, or feel, could turn out to be distinct super-determinates of pain, if they had different values on the physical dimension.

What is Wilson's picture, here, in metaphysical terms? Consider a token instance of super-determinate pain. We are talking about a single property instance possessing multiple dimensions of being, much like our notion of an instantiated colour shade. A pain, thus understood, has at least two dimensions: a qualitative one, concerning how it feels, and a physical one, a specification in neurological terms, say. These dimensions, or rather values thereof, are bound up in the being of this pain instance, and are equally real elements of it.

How do the dimensions relate, on Wilson's view? A point often noted about the colour dimensions is that they are in a crucial sense *independent*. This is not to say they could *exist* separately – a hue cannot presumably lack saturation or brightness. But, given that a

[21] Funkhouser *op. cit.*

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hue must have *some* values of saturation and brightness, the colour dimensions are nonetheless largely *independently variable*. That is to say, brightness is not saturation, and hue is another thing altogether, and a given value in one or two of these dimensions does not generally determine values in the others. A super-determinate colour is construed as a product or unity of values in these three independent elements, three-things-made-one, then, with none of the three taken as fundamental, but rather as existing *alongside* one another (in an admittedly elusive sense) in the super-determinate colour.

Hence, assuming Wilson is serious about the analogy with colours (which she takes over from Funkhouser), on her view a mental property such as a given migraine pain would it seems have distinct, independently varying, dimensions of qualitative character, or feel, on the one hand, and of neuro-physical character, on the other. It would take values in both to yield a super-determinate mental property. But neither, on the model of the colour dimensions, would have metaphysical priority. Just as a physical value is needed to turn a certain qualitative character into a super-determinate property, the converse would also hold—the neuro-physical property would only fix a determinable prior to the specification of a value along the qualitative dimension, e.g. *as painful* in some particular manner.

What would seem to result, on Wilson's view, if this is correct, is not quite *property* dualism, but it does resemble a dualism of dimensions or aspects. It certainly does not appear to be a thoroughgoing physicalism, even of a non-reductive sort, for the reason that the physical dimension is given no priority in the model, any more than hue, saturation or brightness is given priority for colours. Wilson's clear intention, however, following Yablo, is to provide a physicalist theory: 'in the physicalist's view', she says (Wilson, 2009, p. 168), 'features of higher-level properties are ultimately not isolated from—and indeed, are nothing over and above—features of lower-level, ultimately physical goings-on'. This means that Wilson (in all probability) cannot really mean to advance the position we just derived from her colour analogy. To suitably enhance her proposal's physicalist credentials, therefore, let us attempt to give the physical dimension some priority.[22]

[22] This may only be doing proper justice to Wilson's proposal: a reviewer notes that Yablo and Wilson probably take the priority of the physical for granted, rather than trying to explicate or motivate it in terms of the determination relation.

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It is arguable, in the case of colours, that the hue dimension has some kind of priority over the other two. In a reasonable sense, one might think, hue is at the heart of what colours are. Further, it arguably makes sense to think of a hue as *having* saturation, or brightness, but not conversely. So perhaps we could think of the hue value as basic, and the other two as qualifying it. Correspondingly, we could perhaps think, on Wilson's model, of the physical value of the pain property as basic and the qualitative feel value as secondary, even as qualifying it. We might also want to add a supervenience claim, routinely endorsed by non-reductive physicalists, such that any two identical physical values must come with identical qualitative values by metaphysical necessity. I surmise that Wilson and Yablo would be unhappy saying anything else, as that would apparently permit such phenomena as physically undetectable inverted qualia and other physicalist bugbears. The resulting picture looks more appropriately physicalist.

What now becomes evident, however, is that Yablo's view, and Wilson's skilful development of it, does nothing to help with the so-called 'hard problem' of integrating qualitative mentality with the physical.[23] For just how are we to understand the way in which a particular value on the physical dimension of a super-determinate mental property, as such, *necessitates* a certain value on the qualitative dimension? Herein are contained all the difficulties of the hard problem of consciousness, only shrunk to the level of property dimensions!

I will revisit this point below when comparing my proposal to Yablo-Wilson's. But I bracket it presently, in order to introduce my own view, which we have now seen enough of the Yablo-Wilson view to make sufficient sense of. The converse of the Yablo-Wilson view would also frame a mental property as having at least two dimensions, the qualitative and the physical. One option at this point would likewise be to withhold priority from either dimension, resulting in something resembling a dual-aspect view of mental-physical relations. A single, super-determinate, quale would have values in a qualitative as well as a physical dimension, each independent and equally real, with no ontological priority accorded to either – analogous to the colour dimensions as conventionally understood.[24]

[23] In fairness, their main preoccupation is with another major mind-body issue, mental causation.

[24] This is reminiscent of Robert Howell's 'subjective physicalism' (Howell, 2009), on which physical mental properties have a 'subjective

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An important choice point emerges here. When Yablo says physical properties determine mental ones, and Wilson spells this out on his behalf as the theory that mental properties like pain have an additional physical determination dimension, they would seem to be talking exclusively about properties *in the head* or *brain* – that is, mental-slash-neural properties. Wilson is almost certainly not proposing that every physical property *everywhere*, outside heads as well as inside, *throughout* the world, also has a qualitative value analogous to the character of a pain or colour quale! But, if that thesis is unacceptable to a physicalist, the alternative, involving restriction of her thesis to brain properties, also yields a distinctly unwelcome consequence, at least for physicalists,[25] as I will now explain.

The view being offered by Wilson of the world overall, including minds and brains, would be, on this restrictive alternative, that by far most physical properties lack a qualitative dimension – these properties have values *only* on the physical dimension, presumably ultimately cashed out in microphysical terms. But for *one* set of properties with a physical value, namely the *mental physical properties*, these would also have a second value along a second determination dimension, the mental or qualitative: for example, c-fibres firing also has a qualitative dimension with a pain-feel value. Here is the problem. We noted, with Funkhouser, that its dimensions are essential to a property kind: property kinds are distinct just in case they have different dimensions. That is what makes colour a different property from smell, say. The consequence for Wilson is that those properties outside heads with a pure and single physical value, and those inside brains with twin physical and mental values,

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aspect' – Howell's aspects being inseparable but discernible parts of properties. But the views are quite different. My view implies nothing 'subjective' about the qualitative dimension of the relevant properties, and none of the mystery that term connotes. Ontologically, the qualitative simply completes a fully determinate, full-blown, physical property. Indeed, if qualia bring physical properties to full specificity, hence concreteness, they are in an important sense part of the *objective* being of the physical. Epistemically, any apparent 'subjectivity' is only a function of *overarching* epistemic relations among determinables and determinates (as per §3), and nothing peculiar to the mental/physical case.

[25] A reviewer notes that Wilson is herself ambivalent about physicalism's truth, and her development of Yablo's view is in the service of making sense of, rather than defending, non-reductive physicalism. But I will discuss the view she proposes as an option avowed physicalists might wish to embrace.

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would fall out as *two distinct property kinds*, since they differ in their number of determination dimensions. The problem is not that it is mysterious why a mental/qualitative dimension emerges from the physical in the sole context of living brains, though that is indeed a mystery. The problem is more straightforward, and fundamental: On the dimensional conception of properties, if the single-valued properties outside heads, whose instances make up the physicalist's world, are physical, then the dual-valued, physical *and* qualitative, properties inside heads are, quite simply, non-physical.[26]

Wilson overlooks this consequence, I believe, because her focus is so squarely on the mind-brain. Nor is there any obvious way out of the problem for her, on the dimensional construal of properties, because the first alternative, of making the *whole physical world* one of dual-valued physical-and-qualitative properties would seem no more palatable to physicalists. Wilson would be accused of panpsychism. This is a notable way in which, on closer scrutiny, the Yablo-Wilson picture may not end up benefiting physicalism.[27]

Naturally, regarding the converse view, the one I want to explore, the same two options face us concerning distribution: whether to restrict the dual-valued properties to brains or to spread them

[26] Might the dual-valued properties inside heads be *physically acceptable*, even if not strictly *physical*, asks a reviewer, in the way that, perhaps, special science (e.g. biological) properties arguably would be, on non-reductive physicalism? And is non-reductive physicalism really in trouble if there are non-physical properties in any case, given its non-reductive bent? Yet this response seems to suppress the fact that *qualia* are the really troublesome features for physicalism. It might be physically acceptable to have *physical and biological* dimensions for a higher-level property, but that sort of structure seems far more dubious for a *physical and qualitative* property, on the dimensional construal of properties, especially where the rest of the world consists, at base, of single-valued physical properties. Such a position looks very much like an emergentist dualism – compare Sellars's view, mentioned below.

[27] These problems could arguably be averted by adhering to a 'powers subset' view of realisation, which Wilson ultimately favours (thanks to my reviewers here). But there are subtle issues that arise in connection with mental causation, on such a view. Moreover, it is unclear whether the powers subset view can successfully cash out the sense that a determinate *specifies* its determinable: for on that view a determinate has the powers of its determinable *plus some more*. However, my focus is on the dimensional construal of the Yablo-Wilson view, as a touchstone for my own theoretical proposal, and discussing these interesting issues would unfortunately take us too far afield.

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everywhere. The former move will yield something resembling the view Wilfrid Sellars (1981) proposes in his Carus lectures, where he posits irreducibly pink *sensa* as part of the mind/brain system. However, this view features an unwelcome bruteness, since it is simply unclear why some properties with a physical dimension would acquire an additional qualitative dimension in the context of brains. Arguably, a more elegant view would posit qualitative-physical properties everywhere, giving us one kind of basic natural property, either with the two dimensions having parity, or with priority now favouring the qualitative dimension in some manner.

There actually exists independent motivation for the latter alternative, based on the fairly common allegation that the traditionally conceived physical world – the world as characterised by science – is in some important way *abstract*, or lacking the full determinacy characteristic of concreteness. This is a claim prominently associated with Bertrand Russell. As he famously said (Russell, 1927a, p. 171), 'Physics is mathematical not because we know so much about the world, but because we know so little; it is only its mathematical properties that we can discover.' Indeed, Russell is well known nowadays for the doctrine that the intrinsic nature of the physical world eludes us, except in one case: the intrinsic nature of those physical processes that constitute our conscious experiences. In contemporary terminology, the claim is that the traditional physical conception of the world is limited to its *structural* aspects – roughly, those fully characterisable, in Chalmers's (2013) phrase, by 'logical, mathematical, and nomic concepts, perhaps along with spatiotemporal concepts'.

Following Russell, many have felt this conception of the physical to be impoverished. The thesis, along Russellian lines, would be that such a formal structure lacks something necessary for a complete characterisation of concrete physical reality, something akin to 'substance'.[28]

Relatedly, other philosophers have argued that it is precisely the nature of the physical, so understood, that is responsible for the problem of consciousness, since it seems that no quantity of such 'structural truths' tells us much, if anything, about whether some organism is conscious, or what its experiences are like. And some have gone still further, and inferred from the allegedly structural nature of the physical, and the apparent fact that qualia are not merely structural properties, that physicalism is falsified by qualia.[29]

[28] See for instance Strawson (2003), Coleman (2015).
[29] E.g. Chalmers (2002), Alter (2023).

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It is controversial whether the physical-*qua*-structural is lacking anything ontological of note, and ontic structural realists often insist that such a structure exhausts reality, and so much the worse for any supposed properties that apparently have no home in that picture.[30] But if one is at all sympathetic with Russell, and with the notion that the physical structure needs something to supplement it, so that it approaches concreteness, then the addition of a qualitative dimension seems just the thing to do the trick. This move would suffice at a stroke to make the physical more than purely structural, assuming (as many do) that mental qualities are not-merely-structural, and would plausibly help to close the explanatory gap between the physical and the mental. This arrangement would give us something like a 'conjunctive neutral monism'[31], if the qualitative and physical dimensions are left at parity and qualia are taken to be not essentially conscious.[32] Alternatively, a dual-aspect panpsychism would be the result if mental qualities are framed as ineluctably phenomenal – i.e. experiential.

It might be natural, however, to give the qualitative dimension metaphysical priority, along the following lines: We would think of the qualitative *as* structured; that is, the physical-qua-structural element or dimension as qualifying *it*. This might seem natural because qualitative properties, e.g. colour qualia, are precisely the sort of thing that *can* be structured. We just need to imagine some (phenomenal) colour patches and an extended spatial structure falls out. Imagine them changing and a dynamic spatiotemporal structure is generated. Imagine them mixing or blending and something approximating a causal structure is the upshot. The qualitative, then, arguably already has or underpins a structure – a point prominently emphasised, for example, by Daniel Stoljar (2006) in his response to blanket anti-physicalist claims that qualia are 'non-structural' properties.

By contrast, the structural conceived in bare terms does plausibly stand in need of something like the qualitative: we may recall Berkeley's challenge to imagine a shape without filling it in with a colour, or other sensible quality. At this point, a further natural step

[30] See e.g. Ladyman and Ross (2007).

[31] On conjunctive neutral monism fundamental properties are mental and physical, whereas on a disjunctive version they are neutral in the sense of being neither mental nor physical but some third, in-between, kind of property – see Stubenberg and Wishon (2023).

[32] This resembles the view of Coleman (2015); for more on this notion of qualia see Coleman (2022a), (2024).

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might even be to add the claim that values in the physical dimension supervene on values in the qualitative dimension. Then two identical qualities will be physically-structurally identical also. This thesis might be supported by observations such as the asymmetry of the colour solid: given just the qualitative characters of the colours, they do seem to determine a unique asymmetrical structure, such that the solid does not admit of quality-preserving structural permutations.[33]

5. Russellian Monism?

The view just bruited, wherein the qualitative dimension has metaphysical primacy, and it is the qualitative value, e.g. a maximally specific pain quality, that in some sense underpins the physical value, resembles the currently popular family of Russellian monist views, so it is worthwhile to compare the two.

According to Torin Alter and Yuijin Nagasawa (2012), in an influential survey article, it is characteristic of Russellian monism to make a fundamental distinction among property kinds. Perhaps the most common style among Russellian monists is to distinguish *physical dispositional properties*, on the one hand – properties that feature in physics, such as mass, whose nature physics understands in terms of tendencies to interact with other, similarly defined, properties –

[33] Such supervenience would rule out anything resembling the multiple realisability of qualia (if not of the mental, assuming there is more to the mental than qualia) by the physical. If aliens experienced the same qualia as we do, they would have to instantiate, regarding those properties at least, the same values on the physical dimension. This might seem objectionable, not least since Yablo was aiming in part to capture the logic of multiple realisability. Yet multiple realisability, once orthodoxy, now has fewer advocates and significant challengers, such as from resurgent type identity theory. So some will view this feature as a cost of the present view, and some as a virtue. I don't have a special inclination either way. What *would* be licensed by the view, intriguingly, would be variation of the qualitative dimension given fixed values in the physical dimension, if the supervenience relation was asymmetrical. This might seem to threaten the causal closure of the physical. But, akin to Russellian monism, the sense of 'physical' issuing from the present view is, by design, broader than that pertaining to traditional physicalism, and on the enriched (two-dimensional) conception of the physical advanced here, physical closure would not be broken. As with Wilson's theory, two property instances with identical physical-structural values but different qualitative values would, by the theory's lights, not be of the same physical type.

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from a class of *categorical fundamental properties*, on the other hand. These posited categorical properties are ascribed two notable features: i) they are consciousness-relevant, in the sense of constituting in combination (perhaps with physical structural properties), and ultimately explaining, phenomenal consciousness; ii) they *ground* the physical dispositional properties, on the common assumption that dispositions require categorical grounds.[34]

If Alter and Nagasawa are correct, then what I propose is not Russellian monism. First, it makes no fundamental distinction at the level of properties. Second, it does not frame physical properties as purely dispositional, or extrinsic, nor qualia as categorical or 'absolutely intrinsic'. It shies away from a great deal of the Russellian monist apparatus, in fact. Notably, it need not endorse a view of the physical as structural, and of qualia as non-structural, elements of reality. As explained above, on one available version it sees the world's structure as falling out of, or rather as of a piece with, its qualitative nature.[35] But existing Russellian monist theories, at least, seem committed to a strong structural/non-structural distinction regarding the relation of the physical to the mental, and to qualia in particular. The present view's eschewal of the kinds of strong bifurcation among types of fundamental property, of Russellian monism's commitment to the non-structural nature of qualia, and so on, is arguably advantageous, since the nature of dispositions and categorical properties, and their relationship, if any, is highly controversial.[36] No less controversial is the status of other property-pairs invoked to make the fundamental distinction, such as intrinsic/extrinsic. By contrast, the present view makes do with the metaphysically more modest notions of property dimensions and the determinable/determinate relation. And this does not, as noted,

[34] Russellian monists contest the nature of the categoricals: panpsychists construe them as phenomenal properties, panprotopsychists construe them as non-conscious properties that constitute phenomenal properties *en masse*. There is even a strain of Russellian physicalists who hypothesise a mysterious physical categorical nature.

[35] As a reviewer suggests, on this version it would not make sense to talk of a world with structure but without qualities: as below, we profitably construe these as dimensions of a single property.

[36] This sort of consideration also motivates Stoljar (2015) in offering 'Nagelian monism' as an alternative to Russellian monism. Stoljar, similarly, sees advantage in a view with fewer metaphysical commitments, such as concerning the radical difference of supposedly structural and non-structural property types.

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come with any strong commitment to the alleged non-structurality of qualia. The present view, then, seems to gift fewer hostages to fortune.

A kernel of the Russellian monist doctrine of the grounding of the physical in the categorical consciousness-relevant properties may survive, however, if we opt to make values in the physical dimension supervene on values in the qualitative dimension.[37] Nonetheless, we are talking about a single kind of property, by analogy, once more, with other multi-dimensional properties like colours.[38] Now, I do not draw a strong line here: someone could say what has been proposed is an interesting new form of Russellian monism, perhaps with a less controversial metaphysical apparatus attached. That's fine. I just want to clearly emphasise its differences with extant forms, and with the Russellian monist genus as that is characterised in the literature.

6. Conclusion: Virtues of the New View

I end by comparing my fledgling theory with the Yablo-Wilson view. Much of this will be recalling or emphasising things already noted.

[37] What would be the relevant modality here? Options are open, but metaphysical necessity seems most natural.

[38] Russellian monists who reject zombie possibility in effect say we may conceive a human duplicate in merely structural terms and mistakenly think we imagine a possibility. My view says something parallel, couched in terms of the determinable/determinate distinction: When we conceive of a zombie we conceive of a human being in merely determinable terms, but inclusion of the full determinate nature of their panoply of physical properties would include values in the qualitative dimension, hence consciousness. If values in the physical dimension supervene on those in the qualitative dimension with metaphysical necessity – as, plausibly, in the colour solid – ghosts are also ruled out; a ghost would be something akin to a merely determinable colour instance. *But shouldn't we notice if our conception of zombies is merely determinable?* Admittedly, we are not typically misled in this way in other cases. But then again, we have not, generally, considered that traditional physical properties are in some way, as on the present account, incomplete, so the orthodox conception of them as metaphysically complete may have blindsided us as to the status of our conceivings. Recall, too, that if Wilson is right we *have* made the converse mistake in thinking that qualia were more than merely determinable properties.

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i. Mental Causation

Yablo's insight was that if the mental and physical are related as determinable and determinate, they plausibly do not compete for causal efficacy. That is certainly arguable, but to the extent that it is a virtue of Yablo's theory my theory has it equally, despite switching the order of determination.

There are, however, views on which determinables turn out to be in a sense unreal, or lose efficacy with respect to their determinates – at least, everyone agrees that determinates are efficacious if anything is. Depending how that discussion unfolds, the physical dimension taken by itself, as purely determinable, may turn out to lack independent causal efficacy, or, at the limit, reality.[39] That is to say, traditional physical concepts would be in effect too coarse to capture a genuine (i.e. standalone) feature, or carve a true joint, of reality. A similar implication plausibly issues from taking the Russellian monist's categorical grounding of physical dispositions maximally seriously, note – on one way of understanding this doctrine the world's physical structure is no more than how the qualitative *behaves* or evolves over time.

Another thing to note is that my view cannot, plausibly, recover Yablo's pleasing point about the proportionality of mental explanations of behaviour compared to physical explanations. I concede this, but, in reply, I should repeat that my aim is not to capture the virtues Yablo's view has *and then some*. Our views are certainly different, and both have good things going for them.

ii. Perplexities of Consciousness

Earlier I noted that the theory that qualia determine the physical implies some interesting features of the mind-body problem. The view implies, hence predicts, that black-and-white Mary cannot deduce what red is like – for this would be to deduce a determinate from a determinable.[40] Second, it predicts that one must be

[39] See e.g. Gillett and Rives (2005).

[40] In a sense Mary's stock of physical knowledge is incomplete – since it omits information about the super-determinate nature of phenomenal redness. However, it is complete as concerns traditional physical properties. Russellian monists sometimes make a similar distinction between 'deep' and 'shallow' physical properties, or knowledge.

acquainted with a quale to know it properly – something that discussions of qualia standardly assume without explanation – since no amount of traditionally conceived physical, i.e. determinable, knowledge will suffice to know the relevant super-determinate. The view explains, third, why the physical can be understood by disparate sorts of creatures with great qualitative variation in their experiences – since a determinable can be grasped by means of knowledge of a variety of determinates.

These are virtues Yablo's account lacks, since they do depend on the order of determination in my theory. Moreover, these virtues arguably put the view ahead of most competitor theories of consciousness. Indeed, it is hard to think of another view that so simply and transparently accounts for these salient, and typically perplexing, features of the mental-physical relationship.

iii. Mental-Physical Integration

Though it earlier seemed mysterious how the physical could have, or underpin, or necessitate, a qualitative dimension – to understand this is just another manifestation of the hard problem of consciousness – it seems on the face of it at least somewhat less mysterious how the qualitative could have, or underpin, or even necessitate a physical structural dimension. For, as we noted, the qualitative already has a structure. This, again, is an advantage my theory has over Yablo's.

In sum, both theories deal with mental causation, which was Yablo's target, and Wilson's after him. Yablo captures the multiple realisability of the mental by the physical, which my view rejects. But my theory, distinctively, makes considerable headway with the hard problem of consciousness: the problem of intelligibly integrating the mental-qualitative with the physical. Given the power and elegance of Yablo's theory, its inverted twin, which frames qualia as helping comprise the super-determinate nature of the physical, with the qualitative and the physical as determination dimensions of a single class of properties, thus recommends itself as worthy of further attention. The view should be on the map.

Still, one may well remain puzzled about the claim that the qualitative and the physical as traditionally conceived co-exist as dimensions of a single kind of property.[41] Do not these natures, after

[41] I do maintain that what is posited is a single, two-dimensional, *property-type*, not two properties bundled up, on the grounds that

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all, appear so disparate as to make this relation unintelligible? Have we just moved the puzzling knot of the hard problem, shrinking it to the smallest possible size without yet undoing it?

Three points in reply: First, the proposed view can be no more puzzling than its counterpart, the Yablo-Wilson theory, since it is structurally analogous. But that theory is in comparatively good standing – it is among the more innovative, interesting, and powerful suggestions about the mental-physical relationship.

Second, further, however puzzling it remains, this new theory recommends itself, perhaps uniquely, and certainly in comparison to the Yablo-Wilson view, by the way its formal features account for the characteristic perplexities of consciousness. Even if we cannot fully grasp the theory, this may be a strong sign of its truth.

Third, we may perhaps overcome the sense of puzzlement, if such there be. For, on reflection, there is really nothing that ties the disparate dimensions of hue, saturation, and brightness together so tightly as our custom in observing that they never come apart. There is, arguably, little in their individual natures that makes them especially apt for co-habitation. But co-habit they do. More broadly, it is surely an empirical question, as Funkhouser and Wilson note, which dimensions a property kind has. We should not be surprised if certain combinations are initially startling, nor if custom and theoretical virtue eventually dispel this sensation.

Indeed, it has seemed to some that our mistake in tackling the mental-physical relation was, so to speak, in separating the relata in the first place. In an important interpretation of Aristotle's psychology, David Charles (2021) complains of the (as he sees it, post-Cartesian) project to define mental phenomena such as anger, or perception, *either* purely in physical terms, *or* purely in terms of their mentalistic aspects.[42] Rather, according to Charles's Aristotle, anger, visual experience (and other qualitative mental states) take both sorts of values – they comprise *inextricably* psycho-physical goings-on. Charles's Aristotle's view is not reductive in the way the current proposal is – it makes no claim about the nature of basic physical matter as such. But it strikingly resembles my proposal structurally, in seeing the positing of a single, bi-valent, kind

properties are plausibly the causal relata, and these two-dimensional instances would be the causal relata, on my view.

[42] Charles's is, of course, one interpretation of Aristotle, and contested (see e.g. Caston, 2008, for discussion). But whether Charles captures Aristotle is less important for me than whether his view is cogent, which it seems to be.

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of property as the key to overcoming perplexities about consciousness. And Charles also seems to share my view that, considered each in isolation from the other, the mental and the physical remain, as regards true psychological human life, sadly indeterminate. A genuine psychological instance, concrete and determinate, requires a mental and a physical value. Whether the ultimate solution to the conundrum of consciousness is reductive or not, this confluence of views bodes well for the prospects of a two-dimensional proposal like the present one.

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