Grounding the Qualitative: A New Challenge for Panpsychism[1]

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Abstract: This paper presents a novel challenge for the panpsychist solution to the problem of consciousness. It advances three main claims. First, that the problem of consciousness is really an instance of a more general problem: that of grounding the qualitative. Second, that we should want a general solution to this problem. Third, that panpsychism cannot provide it. I also suggest two further things: (1) that alternative kinds of Russellian Monism may avoid the problem in ways panpsychists cannot; and, (2) that a kind of neo-Aristotelian or ground-theoretical physicalism fares just as well here if not better.

> For myself, I think that the only plausible way that a Materialist can deal with the secondary qualities is completely to reverse the whole programme started by Galileo, a programme that has persisted for so long. What we should do is *put these qualities back into the physical world again*.
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> — Armstrong, D. M. (1999: 124)

1 Introduction

One central thesis of *Galileo's Error* is that the problem of consciousness arises because of an apparently fundamental difference between the nature of the physical world and the nature of the conscious mind. On the one hand, it would appear that physical reality can be exhaustively described in quantitative terms. On the other hand, however, it seems that consciousness is an essentially qualitative phenomenon. Accordingly, there seems to be no possibility of locating consciousness within the physical world. That is, it seems that we cannot find a place for consciousness in nature due to the fact that while consciousness is fundamentally qualitative, physical reality is fundamentally quantitative (see esp. Goff 2019: Ch. 1)

The problem of consciousness, as Goff conceives of it, can thus be represented by the following argument:

1 Physical properties are quantitative properties.
2 Mental properties are qualitative properties.
3 Qualitative properties are not identical to quantitative properties.
4 Qualitative properties are not grounded in quantitative properties.

∴ Mental properties are neither identical to nor grounded in physical properties.

[1] A version of this paper was presented to the Philosophy of Mind work in progress group at Oxford; my thanks to the participants on that occasion. Special thanks to Philip Goff for helpful comments, and to Dominic Alford-Duguid for discussion.

Premise 1 follows from the conception of the physical that Goff believes we have inherited from Galileo, on which physical reality can be described entirely in mathematical or quantitative terms (cf. 2019: 21). As for premise 2, this is suppported by the familiar idea that phenomenally conscious states are qualitative states, such that there is 'something that it is like' to be in them (cf. e.g. Nagel; 1974; Levine 1983; see also the extensive discussion in Goff 2017, 2019). As for premises 3 and 4, the basic idea is that there is such a radical difference between merely quantitative properties on the one hand, and qualitative properties on the other, that it is hard to see how qualitative properties could either be identical to, or even metaphysically grounded in, merely quantitative properties (cf. section 6).

The conclusion of the argument, however, is essentially property dualism. (It is also consistent with substance dualism.) After all, the conclusion states that mental properties are neither identical to nor grounded in physical properties. But this means that mental properties are something 'over and above' physical properties, in just the kind of way that traditional property dualists maintain. If we wish to avoid dualism, therefore, we must resist one of the premises.

According to Goff, we should indeed be looking to resist dualism (as many of us will agree). But what are the options? We can distinguish three moves that traditional physicalists might make. The more radical kind of physicalist might reject premise 2. Eliminativists might deny that there are any mental properties at all. Illusionsists, meanwhile, might say that while there are mental properties, they do not really have the qualitative nature that they seem to have. Less radical physicalists, by contrast, who are 'realists' about the qualitative nature of the mental, have two further options. Reductive physicalists will reject premise 3, arguing that mental properties, with just the qualitative natures that they seem to have, are identical to physical properties after all. Non-reductive physicalists, meanwhile, will reject premise 4. On this view, mental properties are qualitative properties that are distinct from but metaphysically grounded in underlying physical properties.

My own view is that something like this last position represents the best hope for physicalists, and I return to this idea below. First, however, I bring Goff's panpsychist response into view. Drawing on ideas from Bertrand Russell (1927) and Arthur Eddington (1928), Goff first points out that physics characterises matter only in terms of its relational properties, leaving open its intrinsic nature. Goff then argues that we know the intrinsic nature of at least some matter, namely, the matter inside our brains. The idea then is that we can combine these points in order to conjecture about the intrinsic nature of matter in general. In particular, the conjecture is that the intrinsic nature of matter is constituted by consciousness. As Goff puts it:

> All we get from physics is this big black-and-white abstract structure, which we must somehow fill in with intrinsic nature. We know how to color in one bit of it: the brains of living organisms are colored in with consciousness. How to color in the rest? The most elegant, simple, sensible option is to color in the rest of reality with the same pen. (2019: 133)

That is, the idea that the intrinsic nature of matter is constituted by the (rudimentary) kind of consciousness that particles instantiate. It thus emerges, on Goff's panpsychism, that 'consciousness *is* the intrinsic nature of matter' (2019: 132).[2]

Goff refers to this as the *simplicity argument* for panpsychism. Notably, the argument has nothing especially to do with the mind-body problem. Rather, the argument is that (i) physics does not tell us about the intrinsic nature of matter and yet (ii) we do know that the intrinsic nature of the matter making up human brains is constituted by consciousness, so (iii) it is reasonable to think that consciousness constitutes the intrinsic nature of all matter (cf. Goff 2019: 134).[3] What Goff argues is that while we have this as an independent argument for panpsychism, we can also draw on panpsychism as a means of avoiding the above argument for dualism.

In particular, Goff argues that panpsychists can challenge premise 1. To help see this, we can borrow a useful distinction from Chalmers (2015). On the one hand, there are *narrowly physical properties*, i.e., the relational properties of matter as described by physics. On the other, however, within a panpsychist framework, there are *broadly physical properties*, which include not only narrowly physical properties, but also those rudimentary conscious properties that make up the intrinsic nature of matter. With this distinction drawn, we can then point to an ambiguity in premise 1:

1a Narrow physical properties are quantitative properties.
1b Broadly physical properties are quantitative properties.

The panpsychist then reasons so. If the argument employs 1a, then while this premise holds, the conclusion does not establish dualism. For it leaves open that mental properties are either identical to or grounded in broadly physical properties. Whereas, if the argument employs 1b, then this premise is false, and so again fails to establish dualism. This is because broadly physical properties include those rudimentary conscious properties that constitute the intrinsic nature of matter, whereby these rudimentary conscious properties are qualitative properties.

Moreover, there is a further aspect to the panpsychist response. On that view, broadly physical properties are in fact (at least partly) qualitative properties. Arguably, this makes it easier to see how mental properties could be either identical to or else grounded in underlying (broadly) physical properties. Hence, panpsychism appears to promise us a way of locating mental properties in the physical world.

Questions remain as to how exactly the mental properties that human persons instantiate relate to the broadly physical properties postulated by the panpsychist. One sort of panpsychist will say that such mental properties are identical to broadly physical properties. Another sort will say that such mental properties are grounded in underlying broadly physical properties. For present purposes, we needn't engage

[2] The idea is that the kind of consciousness that constitutes the intrinsic nature of fundamental particles is a rudimentary kind of consciousness, distinct from the kind of consciousness that we human beings instantiate. One way to think of this is to suppose that human consciousness and the kind of rudimentary consciousness possessed by particles are determinates of the same determinable.

[3] Of course, it might be added that part of what makes this conjecture plausible is that it helps to solve the mind-body problem. So perhaps the two issues are not entirely independent.

further with this question (for relevant discussion see Goff 2019; manuscript & Chalmers 2015). The argument to follow will put pressure on both panpsychist views.

3 A parallel argument

The challenge that I want to press turns on the thought that there are qualitative properties in nature besides conscious properties. In particular, the properties I have in mind are the familiar 'secondary qualities', as I shall call them, following philosophical tradition; that is to say, the qualities of objects including colours, sounds, smells, and tastes. It is a familiar point that such qualities have a distinctive sensuous or qualitative nature. Consider the following passage from Chalmers:

> Phenomenologically, it seems to us as if visual experience presents simple intrinsic qualities of objects in the world, spread out over the surface of the object. When I have a phenomenally red experience of an object, the object seems to be simply, primitively, *red*. The apparent redness does not seem to be a microphysical property, or a mental property, or a disposition, or an unspecified property that plays an appropriate causal role. Rather, it seems to be a simple qualitative property, with a distinctive sensuous nature. We might call this property perfect redness: the sort of property that might have been instantiated in Eden (Chalmers 2006: 67)

Two ideas emerge from this passage. First, that the secondary qualities each have a distinctive qualitative character.[4] Second, that in virtue of this, it is hard to see how they could be reducible to physical properties. In other words, it seems hard to see how such properties could be explicable just in terms of the familiar physical properties and relations that fundamental physics speaks of, just as in the case of mental properties, which also seem to be irreducible.[5] Both points, it seems, are compelling. Taken together, however, they suggest that we can run the following argument for thinking that the secondary qualities are non-physical properties:

1 Physical properties are quantitative properties.
2′ Secondary qualities are qualitative properties.
3 Qualitative properties are not identical to quantitative properties.
4 Qualitative properties are not grounded in quantitative properties.

∴ Secondary qualities are neither identical to nor grounded in physical properties.

Plausibly, whatever reasons we might have for wanting to deny that mental properties are non-physical properties, there will be analogue reasons to deny that secondary qualities are non-physical properties. Accordingly, we have the same sort of motivation for wanting to resist the kind of 'secondary quality dualism' that this

[4] There is a case too for saying that some primary qualities, too, at least as they are presented to us in sensory experience, have a distinctive qualitative nature. I don't press this point here, but for relevant discussion see Broad (1923), Johnston (manuscript); Moran (manuscript-a); Strawson (1979). N.b. sometimes, following Goff (2019), I will just speak of the sensory qualities in general.

[5] Cf. Armstrong (1961: 173-174): '[T]he secondary qualities seem to be, in some sense, *simple* qualities, with the consequence that we are unable to give an account of them in terms of anything else. They seem to be 'intractable', there seems to be no prospect of reducing them to anything else, or exhibiting them as constructions out of simpler elements'.

argument leads to as we have for wanting to resist the more traditional kind of dualism about mental properties. What I want to argue now, however, is that panpsychists lack the resources to defuse this argument. I'll then explain why I believe that this poses a problem for the panpsychist view.[6]

The first point is straightforward. Panpsychists urge that the intrinsic nature of matter is constituted by (rudimentary) consciousness. And this is meant to make it easier to see how mental properties could be identical to or grounded in broadly physical properties. As Goff explains:

> The challenge for the materialist is to bridge the gap between the *objective quantities* of physical science and the *subjective qualities* of conscious experience. But...this project is of dubious coherence, and...not something we have made the slightest progress on. [By contrast, the panpsychist faces the] more tractable...challenge of getting from *simple* subjective qualities to *complex* subjective qualities. (2019: 146).

This move, however, does nothing to help us explain instantiations of non-mental qualitative properties such as the colours. If the challenge is to see how the instantiation of redness by an apple, for example, is somehow reducible to the instantiation of certain physical properties, then the claim that physical properties include rudimentary conscious ones does not help. Put differently, if it is hard to see how redness could be reducible to physical features when these are narrowly construed, it is just as hard to see how redness could be reducible to physical features when these are broadly construed, given that this construal just amounts to thinking of broadly physical features as including rudimentary conscious properties.

One way to emphasise the point is to contrast the following passages. First, Wittgenstein:

> If I turn my attention in a particular way on to my consciousness, and astonished, say to myself: "THIS is supposed to be produced by a process in the brain!" — as it were clutching my forehead. (Wittgenstein 1958: 1. 412)

Perhaps we could make progress lessening the astonishment here by supposing that the intrinsic nature of matter is constituted by a rudimentary kind of consciousness. But now consider the following parallel worry articulated by Shoemaker:

> I look at a shiny red apple and say to myself "THIS is supposed to be a cloud of electrons, protons, etc. scattered through mostly empty space." And focusing on its color, I say "THIS is supposed to be a reflectance property of the surface of such a cloud of fundamental particles". (Shoemaker 1996: 248)

The trouble is that supposing that the relevant electrons, protons, etc. have consciousness as their intrinsic nature does nothing to explain or help clarify how the instantiation of redness by the apple could be constituted by the instantiation of physical properties and relations by the cloud of particles making it up. In other words, the supposition that the particles are conscious simply does not help us to see how the secondary qualities get to be instantiated by ordinary physical things.

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[6] Some other authors who discuss the above kind of argument, and who have noted the parallel with the initial mind-body problem, include Byrne (2006); Fish (2013); Kalderon (2007); Johnston (1996); Lui (this volume); Moran (manuscript-b); Pautz (2013); Shoemaker (1996).

Suppose we grant this point. Why is this a problem for panpsychists? After all, panpsychists are exclusively addressing the mind-body problem. And for all we've said, the panpsychist can solve *that* problem. So where is the issue?

The central point is that we should be looking for a *unified* solution to these problems. The arguments we have outlined are really instances of *a general argument,* which represents what we might refer to as the *problem of grounding the qualitative*. What I want to suggest at this juncture is that the mind-body problem, as well as the problem of accounting for the secondary qualities, would seem to be merely two instances of this more general concern (cf. Moran manuscript-b):

1 Physical properties are quantitative properties.
2″ Some properties (mental and non-mental) are qualitative properties.
3 Qualitative properties are not identical to quantitative properties.
4 Qualitative properties are not grounded in quantitative properties.

∴ Some properties are neither identical to nor grounded in physical properties.

What we should be looking for, therefore, is a general explanation as to how qualitative properties, whether mental or non-mental, can be understood in physical terms. Panpsychism, however, cannot provide this. And therein lies the problem.[7]

4 Projectivist Panpsychism

There is an important line of response that panpsychists might make at this juncture. So far, I have been assuming a certain kind of realism about the secondary qualities, which we can refer to, following Chalmers (2006), as the *Edenic view*. The idea is that external things really do instantiate the qualitative properties that they appear, in conscious experience, to have; that things really are coloured, and make the sounds, and have the smells and tastes, that perception presents them as having. It has been common for philosophers, however, to deny this. On that view, there is something it is like to see a rose. But the rose itself is not really red as it appears to be. Rather, the rose's read appearance is a mere function of how sensory experience represents things to be.[8] In fact, this is precisely the view that Galileo took of the sensory qualities:

> I think that tastes, odours, colours, and so on are no more than mere names so far as the object in which we place them is concerned, and that they reside only in consciousness. Hence if the living creature were removed, all these qualities would be wiped away and annihilated. (1623: 274)

[7] It is sometimes argued that the *real* problem is that of grounding the secondary qualities in the physical, and that the hard problem of consciousness is secondary at best (see e.g. Allen 2016; Byrne 2006; Cutter 2018; Fish 2008, 2009, 2013; Johnston 1996; Kalderon 2007). My own view, by contrast, is that we have one general problem here, of which both the problem of consciousness and the problem of secondary qualities are instances. For more details see Moran (manuscript-b).

[8] This expression is intended neutrally. There are various ways to make sense of how exactly, on a non-Edenic view, sensory experience nevertheless portrays the world as containing the secondary qualities, without having to presuppose representationalism in the contemporary sense.

The idea is that such qualities are not really features of external things, but are instead properties of experience (or 'qualia', as they are sometimes called), which exist only in the mind. Commonsense is therefore guilty of a fundamental *projectivist* error: we mistake the qualitative properties of (or otherwise involved in) sensory experience for qualitative properties of external items (cf. Johnston 1996; Kalderon 2007).[9]

Suppose, just for the sake of argument, that a projectivist view could be motivated. My argument against panpsychism would then be undercut. The problem of consciousness would pose a genuine problem. But there would be no analogous problem involving secondary qualities. Moreover, the only qualitative properties in reality would be mental properties. Accordingly, my criticism of the panpsychist, namely as posing a too narrow solution to a general problem, will not succeed.

There is some evidence that Goff accepts this kind of projectivist panpsychism. At the beginning of Goff's book, we're told that Galileo first took the radical step of viewing the sensible qualities of external objects as having existence only in the mind. Notably, moreover, Goff seems to accept this aspect of the Galilean programme. For, Goff sees the philosophic challenge in precisely Galilean terms: as that of explaining how the sensible qualities, *reimagined, on Galilean lines, as mental properties rather than features of external things*, fit into the external world. Consider:

> …Galileo took the secondary qualities (sounds, smells, tastes, odours) out of its domain of inquiry: by reimagining them as forms of consciousness…The fact that physical science has been extremely successful when it ignores the sensory qualities gives us no reason to think that it will be similarly successful if and when it turns its attention to the sensory qualities, reimagined as forms of consciousness (2019: 136)

Here, Goff seems to grant that the sensible qualities, which *seem to be* features of external things, should be (re)conceived as properties of mental states. Goff then sees the challenge as that of making sense of place of these qualitative mental properties within the rest of the physical world (cf. Goff 2017: Ch. 1; 2019).

But this brings out an important point. One might have hoped, when reading the initial pages of *Galileo's Error,* that we would be provided with materials for reversing the whole Galilean programme: that is, for putting the sensible qualities of external objects back into the external world, as well accounting for the place of mental qualitative properties within nature. Goff even suggests at one point that this is something that his panpsychism will help with:

> In 1623 Galileo took the sensory qualities out of the physical world. Three hundred years later in 1927 Russell and Eddington finally found a way to put them back. (2019: 137-138).

What I have brought out here, however, is that this is not so. Granted, for all that I have said, panpsychism may help us to locate mental qualitative properties within the physical world. But it does nothing to help us locate the sensible qualities of

[9] For discussion of how considerations of simplicity may seem to motivate this view see Lui (this volume). Goff (personal correspondence) argues that we have a kind of privileged access to our qualia, of a sort that we do not have to the qualitative features of external things, and that this too might motivate projectivism. To my mind, however, this gets the order of explanation the wrong way around—both epistemically (see Martin 1998) and metaphysically (see Moran manuscript-b).

external things. It follows that Goff's panpsychism needs to be projectivist panpsychism, which denies the reality of Edenic qualities conceived as features of external things. It has to deny, that is, just like Galileo, that external things really have the various qualitative properties, the various sounds and tastes and colours, that they seem to have. But this means that Goff's panpsychism cannot reverse the Galilean programme in the way that it initially seemed to promise. In fact, for those of us who are sympathetic to the idea that we live in an Edenic world, it seems that Goff's panpsychist view remains beholden to a fundamental Galilean mistake, namely, the mistake of 'mentalising' the sensible qualities; of taking what are in fact qualities of external items and treating them as mere creatures of the mind.[10] In turn, this suggests that Goff's framework does not in fact allow us to fully reverse the Galilean programme in the way that the *Galileo's Error* seemed to promise.

5 Russellian Monism

There is another response Goff might by sympathetic to, and that in any case is worth exploring. In *Galileo's Error*, Goff distinguishes panpsychism in particular from the more general position known as 'Russellian monism' (of which panpsychism is just one instantiation). The difference may be characterised by again utilising the distinction between narrow and broadly physical properties. Narrow physical properties are dispositional properties such as mass and charge. They tell us what physical things do; not what they are. But broadly physical properties also include what I will call *quiddities:* the intrinsic properties that characterise the intrinsic nature of the entities that physics deals in.[11] Panpsychists are Russellian monists for whom the quiddities are to be thought of as conscious properties. However, *some* kinds of Russellian monist do not suppose the quiddities are conscious properties (although they still insist that whatever nature such quiddities have, they will help us to resolve the mind-body problem). What I want to suggest is that certain non-panpsychist forms of Russellian monism may be better off than panpsychism when it comes to meeting the challenge that I set out above. For, such views are in a position to claim that qualitative properties in general are ultimately explained by the intrinsic nature of matter, whatever that turns out to be. Panpsychists, meanwhile, as we have seen, are not in a position to make this claim.

One way to illustrate this is as follows. Traditional versions of Russellian monism, just like panpsychism, are geared towards resolving the problem of consciousness with which we started. In recent work, however, Cutter (2018) has argued for *Sensible Quality Russellian Monism*. On that view, the quiddities that partially characterise the broadly physical properties are not conscious properties but rather properties of another kind. Leaving open their nature entirely leaves us with Neutral Monism proper: the idea that matter has as its intrinsic nature unknown to us. But there are various other non-panpsychist options for specifying the intrinsic natures or the quiddities of matter (cf. Cutter 2018; Lui this volume). Among them is a variation of an idea, prominently defended in recent times by Coleman (2015), known as 'panqualityism'. On this view, the quiddities are not conscious

[10] Recent advocates of the Edenic view include Allen (2016); Cutter (2018); Lui (this volume). It is, of course, controversial whether or not Galilean projectivism constitutes a *mistake*.

[11] Goff (2019) refers to these as 'intrinsic natures' throughout *Galileo's Error*.

properties, but rather qualitative properties whose nature is not further specified, besides the claim that they are non-experiential. According to Cutter (2018), this kind of view is well-suited to accounting for the secondary qualities, though it is not well-suited for handling the mind-body problem for which it was originally designed. However, it is not obvious that this last is right. Instead, it seems, one could argue that higher-level qualitative properties in general are ultimately derived from the more basic qualitative properties that constitute the intrinsic nature of matter.

What the above brings out, I submit, is that if our ambition is to deal, not just with the mind-body problem, but with the more general problem of accounting for the full range of qualitative properties that nature contains, then, if we are to be Russellian monists, we must endorse a kind of Russellian monism other than panpsychism. As panpsychists, we may be able to handle the mind-body problem. However, we will be unable to account for the place of the secondary qualities in nature, and hence the more general problem will remain unsolved. As non-panpsychist Russellian monists, by contrast, we have a chance at solving the more general problem. So, the result appears to be that if we are to be Russellian monists, we should not be panpsychists, but rather Russellian monists of some other kind.[12]

My own view, however, is that to answer the more general problem, we need not adopt any form of Russellian monism. To end the paper, then, I wish to outline a different proposal of my own; a kind of neo-Aristotelian physicalism that has been gaining traction in the recent literature (cf. Dasgupta 2014; Schaffer 2017).

6 Grounding Physicalism

Recall the following argument:

1 Physical properties are quantitative properties.
2″ Some properties (mental and non-mental) are qualitative properties.
3 Qualitative properties are not identical to quantitative properties.
4 Qualitative properties are not grounded in quantitative properties.

∴ Some properties (mental and non-mental) are neither identical to nor grounded in physical properties.

The premise I would want to resist here is:

4 Qualitative properties are not grounded in quantitative properties.

If we make this claim, then in relation to the pro-dualist argument of Section 2, we can deny that mental properties are not grounded in physical ones. And in relation to the anti-physicalist argument about the sensible qualities of Section 3, we can deny that non-mental qualitative properties like the redness of the rose are not

[12] Note that Goff is sympathetic to this kind of Russellian Monist position and is open to non-panpsychists versions of this sort of Russellian view See e.g. Goff (2017; 2019: esp. 137;). However, notice that if Goff retreats to Russellian Monism then the simplicity argument from earlier for panpsychism can no longer be relied upon. To that extent, Russellian monism of the non-panpsychist kind looks considerably less well-motivated. I leave open how much of a worry that is.

grounded in underlying fundamental physical properties. All of these qualitative properties thus end up being non-fundamental physical features of reality that are conceived as being grounded in more fundamental physical features.[13]

Now, Goff (2019; manuscript) is unsympathetic to this kind of view, doubting that it constitutes a genuine variety of physicalism (cf. Pautz forthcoming; Schaffer 2017 offers a nice reply to this charge, see also Moran manuscript-c). Here is his main concern:

> Many people take materialism to be the view that the brain *produces* consciousness, as though consciousness were some peculiar kind of gas that the physical workings of the brain bring into being. However, such a view would not be materialism, as it implies that consciousness is something over and above the physical workings of the brain...In fact, materialism is the view that experiences and feelings are identical with states of the brain... (2019: 92-93)

The idea seems to be that any view on which we have anything less than identity between the physical and the mental implies that mental properties are 'something over and above' physical properties, meaning that we would not have genuine form of materialism.[14] However, the phrase here 'nothing and above' is open to interpretation. If x is something over and above y just because x and y are distinct, then the smile of the cat is something over and above the smiling cat. This, however, is implausible, given that the smile of the cat is grounded in and dependent on the smiling cat itself. (That this is so, of course, is what constitutes the philosophical underpinnings of a lovely joke in *Alice in Wonderland.*) Thus, there is room to deny that x cannot be over and above y unless x is identical to y. And, hence, there is room to claim that in the relevant sense, mental properties are nothing over and above their ultimate physical grounds, despite being distinct therefrom.[15]

But there are further concerns. First, there is a modal argument. As Cutter (2018: 50) rightly emphasises, 'there is some intuitive plausibility to the idea that no collection of non-qualitative properties could be sufficient for the instantiation of a qualitative property.' (cf. Chalmers 2015: 268; Coleman 2015: 76). If that is right, however, then we can appeal to the idea that *grounds necessitate* to generate a problem for the kind of 'grounding physicalism' I am trying briefly to motivate. Let us suppose that qualitative property Q is grounded in physical properties P1, P2…Pn. If no collection of physical properties is *sufficient* for the a qualitative one, then we can have P1, P2…Pn without Q. Yet it is widely held that grounding does

[13] Note that this view also implies that 1 is false, since it implies that some higher-level (non-fundamental) physical properties are in fact qualitative properties, namely certain mental properties and certain secondary qualities. Thus, instead of claiming that all physical properties are quantitative properties, we should say that all fundamental physical properties are quantitative properties. This then leaves room for non-fundamental physical properties to be both qualitative and ultimately grounded in the fundamental quantitative properties.

[14] That said, Goff (2017) is somewhat more permissive (seep especially chapter 1). On that view, mental properties need not be identical to physical features, although do have to be what Goff calls 'constitutively grounded' in such features. Presumably, Goff would argue that it is problematic to suppose that mental properties are grounded in this way in fundamental physical properties, whereas I would wish to deny precisely this claim.

[15] One way to further develop this thought is to point out that in general, grounded items derive their natures and identities from the more fundamental items in which they are grounded. Cf. Moran (manuscript-c).

not allow for that. If *what makes it the case* that some object O is Q is that some particles have P1, P2…Pn, i.e., if the particles having P1, P2…Pn is what metaphysically explains why O has Q, then one might think that necessarily, whenever those particles have P1, P2…Pn, then O must have Q. So the argument is:

1 Since P1, P2…Pn are quantitative, they are not sufficient for the instantiation of Q.
2. If any properties G1, G2…Gn are not sufficient for the instantiation of some property F, then F is not grounded in the instantiation of G1, G2…Gn.

∴ The instantiation of Q is not grounded in the instantiation of P1, P2…Pn.

While I lack the space to develop this idea here, I think the premise to deny here is premise 2, i.e., the principle stating that if G grounds F then necessarily, whenever G occurs G must ground F. I argue against this in Moran (2018, 2021); others have done so elsewhere. But think of it this way. It was once a dogma that causation must necessitate: that if a causes b then a has to suffice for b. However, many philosophers are now happy to deny that this is so (dispositional essentialists aside). Perhaps, therefore, the same thing holds in the case of grounding. In other words, it may be that constitutive determination, no less than causal determination, does not require necessitation. Granted, in some cases, the ground will be sufficient for what it grounds: for example, when an item is scarlet, this is sufficient for the item to be red. However, consistently with this, there may be counter-examples to the more general idea that grounds always necessitate. For example, it is plausible that the general fact that <all swans are white> is grounded in a range of particular facts to the effect that each actual swan is white. However, since there could have been an additional non-white swan, there is a possible world in which all of those particular facts that act as grounds obtain, despite the corresponding general fact failing to obtain. The particular facts, therefore, do not necessitate the general fact. Arguably, however, this does not undermine the plausible idea that as things stand, the general fact is grounded in the various particular facts (cf. Bader manuscript-b;; Sider 2020). Moreover, this is just one possible example of contingent grounding. Perhaps, then, when qualitative properties are grounded in underlying quantitative properties, we have another example of contingent grounding.

I will consider one further argument. I said earlier in section 2 we can motivate the idea that qualitative properties cannot be grounded in quantitative ones by appeal to familiar explanatory gap type concerns. One might just think: *how could a qualitative property be grounded in a quantitative one*, *given that these properties are so different*? But then, if there is no intelligible connection between these types of properties, one might wonder how the one set could be grounded in the other. That is, the presence of an explanatory gap would seem to preclude the qualitative properties in nature from being grounded in the fundamental quantitative ones.

This worry, I think, really takes us to the heart of the matter. That is, it brings out the real nature of the problem of grounding the qualitative in the fundamental physical. Fundamentally, the problem is analogous to several other 'location' problems.[16] One well-known example concerns locating the abstract within a fundamentally concrete world. Another concerns the place of asymmetric relations in a

[16] I borrow the idea of a 'location problem' from Jackson (1998).

world with only symmetric relations at the fundamental level.[17] A third concerns how we can derive dispositional properties from a world that is fundamentally categorical in nature. The central challenge, in all these cases, is to get from one from kind of property to another even when the properties are of radically different sorts. Now I submit that one cannot do this when one looks only at the nature of the properties. Hence the importance of a kind of physicalism that also allows us to look at the relationship between them. What we need is a grounding relation that can act as a bridge to take us from the more fundamental property of kind K to the radically heterogenous and comparatively more derivative property of kind K*.

Even once we posit a grounding relation, however, explanatory gaps may remain. But perhaps grounding relations admit of explanatory gaps (Schaffer 2017). Indeed, we should arguably expect such gaps, if the grounding relation is, as I have claimed, able to connect properties with radically different natures. The view I recommend, therefore, is that while qualitative properties and their underlying physical grounds are radically different in nature, the former derive from, and are dependent on, the latter. When a person is conscious, or when a rose is red, these facts obtain in virtue of more basic facts involving quantitative physical properties at the fundamental level. If such a view can be developed, then we can answer the general problem of grounding the qualitative without having to speculate about the intrinsic nature of matter. And that, it seems to me, is a view well worth exploring.

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[17] There is reason to think that at the fundamental level, reality contains only symmetric relations. So how does reality at the higher-levels contain asymmetry? One way of trying to solve this puzzle is developed in detail in Bader (2020).

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