



# Primitive colours in a physical world

Alex Moran<sup>1</sup>

Received: 15 March 2024 / Accepted: 14 April 2025  
© The Author(s) 2025

## Abstract

Colour primitivism is the thesis that the colours are simple qualitative properties of items in the external world—just as they appear to be. This paper considers colour primitivism in relation to a version of Frank Jackson’s knowledge argument. On the one hand, this argument seems to support primitivism, by delivering the conclusion that the colours cannot be reduced to underlying physical features of a sort that Mary might have known about even in the room. On the other hand, however, the argument threatens to show that primitivism cannot be combined with even a fairly minimal (non-reductive) form of physicalism, on which the colours are conceived as supervenient upon or grounded in underlying physical properties. To resolve the tension, the paper recommends a novel primitivist take on the knowledge argument, which turns crucially on the classical empiricist thesis to the effect that certain facts about the colours can only be learned on the basis of sensory experience.

**Keywords** Colour primitivism · Knowledge argument · Grounding · Physicalism · Metaphysics

[T]he secondary qualities seem to be...*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.

D. M. Armstrong (1964: 173–174)

---

✉ Alex Moran  
alex.moran@unifr.ch

<sup>1</sup> Faculty of Humanities Department of Philosophy, Université de Fribourg, Av. de l’Europe 20, Fribourg 1700, Switzerland

## 1 Introduction

Colour primitivism is the thesis that colours are simple qualitative properties of external things—just as they appear to be.<sup>1</sup> They are not microphysical properties, nor dispositions to produce experiences in us, nor the categorical bases or the grounds of such dispositions. Rather, they are irreducible, *sui generis* qualitative features of external items populating the objective world we see and sense.<sup>2</sup>

If primitivism is true, then we live in a prelapsarian world: that is, we live (at least as far as the colours are concerned) in the philosophical Garden of Eden, as described in detail by Chalmers (2006).<sup>3</sup> Might it also be that we live in a wholly physical world, as many of us are inclined to suppose? One might think that the answer is obviously negative. After all, in Eden, the colours are *sui generis* features of external objects, irreducible to underlying physical properties. Accordingly, it might appear that primitivists must view the colours as being non-physical.

Despite the name, however, it is at least coherent to suppose that colour primitivism can be combined with a general commitment to (some form of) physicalism. To say that colours are ‘primitive’, in the sense at issue, is not to say that they are non-physical, or that they must be conceived as physicalistically unacceptable. It is rather to insist that colours are simple qualitative properties that cannot be reductively identified with underlying physical properties of a non-simple and non-qualitative sort. Thus, while primitivism is incompatible with certain forms of reductive physicalism, it is at least not obvious that it is incompatible with physicalism *tout court*.<sup>4</sup> That is, there is conceptual space for claiming that while the colours are simple qualitative features, just as they appear to be, they are nonetheless metaphysically dependent on underlying physical features. In turn, this would plausibly entail that the colours are physical features themselves, or at least features that are physicalistically acceptable, i.e. acceptable even within a physicalist ontology.

That said, a problem arises once we consider a central line of motivation for primitivism, which comes in the form of a modified version of Frank Jackson’s (1982) ‘knowledge argument’. On the one hand, this argument seems to support primitivism, by delivering the conclusion that the colours cannot be reduced to underlying physical features (such as light-reflectance profiles, etc.) On the other hand, however, the argument threatens to show that primitivism cannot be coherently combined with even the minimal or non-reductive form of physicalism just sketched, on which the colours are conceived as metaphysically dependent on underlying physical properties. The present paper is concerned with this issue. To resolve the tension, the paper recommends a novel primitivist take on the knowledge argument, which involves

<sup>1</sup> Recent advocates of colour primitivism include Allen (2016); Campbell (1997, 2005); Gert (2006, 2008); McGinn (1996); Watkins (2005). See also Sethi (2023).

<sup>2</sup> Not that colours are always features of *objects*. They can of course also be features of light sources and volumes. (I set aside here the important question whether the colours are rightly conceived as *properties* at all. For relevant discussion see Johnston [forthcoming])

<sup>3</sup> With one caveat: Chalmers’ Eden is a world wherein experiences of sensible qualities are not the results of causal processes. Colour primitivism, however, carries no commitment to this idea.

<sup>4</sup> For this reason, one might find the label ‘primitivism’ misleading, and prefer instead to follow Allen (2016) in referring to the view as *naïve realism* rather than *primitivism* about the colours.

accepting the classical empiricist idea that certain facts about the colours can only be learned on the basis of experience.

The paper is structured as follows. Section 2 develops one specific way in which primitivism might be situated within a physicalist framework, which utilises the neo-Aristotelian notion of metaphysical grounding. Section 3 shows that while a version of the knowledge argument can be used to argue in favour colour primitivism, this argument seems also to deliver the unwanted result that colour primitivism is incompatible with physicalism. In response, Sect. 4 outlines a novel perspective on the knowledge argument that retains the motivation for primitivism whilst avoiding this unwanted anti-physicalist result. Section 5 concludes.

## 2 Physicalist primitivism

The primitivist claims that colours are *sui generis* qualitative properties of objects that are not reducible to underlying physical properties. *Prima facie*, one might think that this view is incompatible with physicalism about the colours. However, a robust sense in which the colours might still be construed as physical (or at least physicalistically acceptable) can be given by situating colour primitivism in a grounding physicalist framework. On the proposed view, colours are still *sui generis* qualitative properties of external objects. However, objects possess the colours they do in virtue of having certain more basic physical properties. The colour properties of an object are thus metaphysically grounded in certain underlying, metaphysically more basic physical properties of that object, and this makes it the case that they classify as being physical properties themselves (or at least as being non-physical properties of a harmless sort that physicalists could easily accept).<sup>5</sup>

It is common for colour primitivists to insist that on their view, primitive colours at least supervene on underlying physical properties (Allen, 2016; Campbell, 2005; McGinn, 1996). It is, moreover, commonly claimed that this makes colour primitivism compatible with at least a non-reductive sort of physicalism. However, for familiar reasons, this claim of supervenience is insufficient for capturing the idea that the colours are physical properties (cf. Horgan, 1993, Kim, 1993; Wilson, 2005). One way to bring this out is to consider a broadly Moorean view in meta-ethics whereby normative properties are irreducibly normative and non-natural whilst also being supervenient on underlying natural properties. There is perhaps a question as to what exactly would explain this supervenience relation (cf. Hattiangadi, 2018), but this does not undermine the observation that the supervenience claim is insufficient (by itself) to ensure that the irreducibly normative properties posited by the Moorean are naturalistically acceptable. In precisely the same way, merely asserting that the colours supervene on underlying physical properties appears insufficient for accommodating the colours within a physicalist framework. (The colours might be both non-physical and supervenient, just as the Moorean's normative properties are both

---

<sup>5</sup> I don't suppose that much really hangs on the choice between these options ('physical' or 'physicalistically acceptable', though I will generally speak as if I endorse the first in what follows.

non-natural and supervenient. Cf. Horgan, 2006: 161; Stoljar, 2010: 146; Wilson, 2005: 436; White, 2018.)

By contrast, the claim that the colours are metaphysically grounded in underlying physical properties plausibly does secure the result that the colours are themselves physical properties (or at least properties of a sort that the physicalist can accept). If the colours are grounded in underlying physical properties, then the colours turn out to be derivative properties whose instantiations are ontologically dependent on instantiations of more fundamental physical properties. Accordingly, it is plausible to maintain that if the colours are grounded in underlying physical properties, then they are themselves physical properties (or at least properties of a sort that the physicalist can happily admit into her framework).<sup>6,7</sup>

On the conception of grounding I have in mind, grounding is a relation of metaphysical determination paradigmatically expressed by means of the ‘in virtue of’ locution (cf. Audi, 2012; Fine, 2012; Rosen, 2010). Following Rosen (2010), I’ll take grounding to be a relation between facts, and I’ll conceive of facts as true Russellian propositions, i.e. as structured entities with objects and properties as constituents. Two facts will therefore be identical just in case they involve the same objects and properties combined in the same ways. With this in mind, and using Rosen’s notation, we can express grounding relations in the following way:

$$(1) [p] \leftarrow [q]$$

...where this tells us that the fact that *p* obtains in virtue of the fact that *q*; or, equivalently, that the fact that *q* metaphysically grounds the fact that *p*.

Using the notion of metaphysical grounding just outlined we can express a form of physicalism by stating that all facts are either fundamental physical facts or else grounded in fundamental physical facts (cf. Bader forthcoming; Dasgupta, 2014; Goff, 2017; Lui forthcoming; Moran, 2023a,b; Schaffer, 2017). Let the fundamental physical facts be the facts disclosed by a completed basic physics; these we can refer to as narrowly physical facts. The remaining derivative facts will then be those facts that are metaphysically grounded in the fundamental ones; call these broadly physical facts.<sup>8</sup> To situate colour primitivism in a physicalist framework, we can maintain that the colour facts are broadly physical facts, insofar as each such fact is metaphysically grounded in some suitable array of narrowly physical facts. In this framework, whenever *a* instantiates some colour property *F*, the fact [*F*(*a*)] will be metaphysi-

<sup>6</sup> For some more detailed defences of the idea that properties grounded in physical properties are themselves either physical or at least physicalistically acceptable see Bader (forthcoming); Moran, 2023a; Schaffer, (2017), manuscript). I also say some more about this idea below.

<sup>7</sup> It is also worth noting here that if one did think that a mere supervenience claim is sufficient for securing the (at least broad) physicality of the colours, one should for this reason grant that the grounding physicalist thesis to the effect that the colours are grounded in fundamental physical properties is also sufficient for securing that result. This is because, given the plausible and widely held idea that grounds necessitate, grounding physicalism about the colours will imply (even if it is not implied by) supervenience physicalism about the colours of the sort many primitivists endorse.

<sup>8</sup> We thus get a disjunctive account of what it is for a fact to be physical (or acceptable within a physicalist ontology): either that fact is one of the basic physical facts extracted, perhaps in broadly Quinean fashion, from our best physics, or else it is metaphysically grounded therein. Cf. Moran (2023a, forthcoming).

cally grounded in (and so will obtain in virtue of) some suitable array of fundamental physical facts  $[\Gamma 1]$ ,  $[\Gamma 2]$ , ...  $[\Gamma n]$ . In notation:

$$(2) [F(a)] \leftarrow [\Gamma 1], [\Gamma 2], \dots [\Gamma n]$$

On the resulting picture – which we might refer to here as *physicalist primitivism* – colours facts are higher-level physical facts grounded in narrowly physical facts. Whether the colours are themselves physical *properties* then depends on further questions concerning, for example, the ways in which instantiations of colour properties are grounded elsewhere in modal space. It is sufficient for physicalism that all the actual instantiations of the colours have physical grounds, and this is what the present proposal guarantees. If instantiations of the colours have physical grounds everywhere in modal space, then plausibly the colours are themselves physical properties. If, however, some possible colour-instantiations have non-physical grounds, then what we might want to say instead is that the colours are physicalistically acceptable properties, i.e. properties whose instances can have physical grounds and in fact do (but need not do so everywhere in modal space).<sup>9</sup> In what follows, however, I will set aside this complication, continuing to speak, for ease of presentation, of the colours as being broadly physical properties that are (wholly and fully) grounded in more basic narrowly physical properties.<sup>10,11</sup>

One initial worry with this view is that it seeks to situate an avowedly non-reductive theory in a ground-theoretic setting. For it is often said that grounding relations have reductive import, and one might think therefore that there is something incoherent about the physicalist primitivist view that I have just described. Here is one way to develop this concern.<sup>12</sup> In many cases, grounding claims are associated with corresponding real definitions of the grounded property in terms of its grounds. Moreover, it is often the case that the relevant grounding claims flow from these associated real definitions. What it is for something to be square, for example, is for it to be an

<sup>9</sup> This might happen, for instance, if the colours are ‘ontologically flexible’, in something like the sense of Sethi (2023), so that while in the actual worlds, instantiations of the colours are grounded in instantiations of physical properties, in other possible worlds instantiations of the colours are grounded in mental facts fundamentally involving subjects of experience. Another way in which this might happen is if the colours are variably fundamental (cf. Wildman, 2018) such that instantiations of the colours are grounded in the actual world but ungrounded at other worlds.

<sup>10</sup> Wholly, in the sense that they are not grounded in any other properties; fully, in the sense that the narrowly physical properties constitute full rather than partial metaphysical grounds.

<sup>11</sup> A worry: I have said that we can think of instances of the colours as having physical grounds. And this might be fine as far as external instances of the colours go. E.g., the redness of the rose might be grounded in certain basic physical facts regarding the atoms composing the rose. But what about those instances of redness involved in hallucinating redness, say, or dreams? There are two things to say. Many would deny that there are any such instances of redness, holding instead that there are *only* external-world instantiations of colour properties. (In hallucination, on such views, the most that can be said is that one represents a colour property as being instantiated, without this actually being so.) Even those who do allow, however, that genuine instances of redness are involved in hallucinating might still insist that such instances are physically grounded, e.g. by insisting that they are grounded in neurological facts involving the subject. For a recent defence of such a view see Sethi (2023). Relevant also is the kind of sense-datum view defended in Lee (2014).

<sup>12</sup> On grounding and reduction see Bader (forthcoming); Dorsey (2016); Rosen (2010).

equilateral rectangle. So, it is no surprise that when a thing is an equilateral rectangle, it is a square in virtue of that fact. Likewise, what it is for someone to be a bachelor is for that person to be both unmarried and male. So, it is no surprise that when a person is both unmarried and male that person is a bachelor for that reason. We can also consider more complex cases. It is plausible to think that for an object to be  $F$ , where  $F$  is a determinable property, is for that object to be  $G_1$  or  $G_2$  or... $G_n$ , where  $G_1, G_2...G_n$  are the various determinates of  $F$ . Given this account of what it is to be  $F$ , it will of course be no surprise that when an object has one of these determinate properties, say  $G_1$ , it will have the determinable property  $F$  for that reason, i.e. in virtue of having  $G_1$ .

What the above might suggest that in general, if  $x$ 's being  $F$  is grounded in  $x$ 's being  $G$ , then being  $G$  should figure in the real definition of being  $F$  (Aleksiev, 2022: § 4; Goff, 2017: ch. 1; Moran, 2023b: 9–10). In turn, however, this suggests that if colour properties are grounded in physical properties, then one should be able to give a reductive account of the colours in physical terms, by means of providing a real definition of each colour in terms of its physical grounds.<sup>13</sup> The trouble though is that the combination of colour primitivism with grounding physicalism implies that this is not the case, since the colours, on a primitivist theory, are *sui generis* properties for which no real definition in other terms can be given.

A second, related concern regarding physicalist primitivism derives from the plausible idea that in general, grounding relations are *mediated* by the essences of the properties involved in those relations (cf. Audi, 2012; Dasgupta, 2014; Fine 2012; Rosen, 2010). Take the schematic claim that  $a$  is  $\Phi$  in virtue of being  $\Psi$ :

$$(3) [(\Phi(a)) \leftarrow [\Psi(a)]]$$

Here, the mediation principle implies that it must lie in the nature of *being*  $\Phi$ , and/or *being*  $\Psi$ , that whenever any (possible) object  $x$  is  $\Psi$ ,  $x$  is  $\Phi$  for that reason.

The trouble is that whilst the mediation principle is plausible, it looks incompatible with physicalist primitivism. Consider again claim (2). On the one hand, when we look to the natures of the physical properties that are the constituents of the grounding facts  $[\Gamma_1], [\Gamma_2], \dots [\Gamma_n]$ , we won't find anything that could explain the grounding connection between the grounded fact on the one hand and the grounding facts on the other. After all, narrowly physical properties can plausibly be exhaustively characterised in causal-structural terms (cf. Chalmers, 1996; Foster, 1982). Moreover, it appears that regardless of what exactly one says about the nature of physical properties, no plausible account of their natures will make any mention of higher-level features like the colours.<sup>14</sup> On the other hand, however, colour primitivism implies that

<sup>13</sup> In Goff's (2017: ch. 1) terminology, this amounts to the claim that the colours must be *constitutively* grounded in underlying physical properties if they are so grounded at all. Cf. here also Fine (2012), who argues that in general grounding connections are backed by essentialist facts linking the essence of the grounded property (or fact, as Fine prefers to say) to the various properties (or facts) that ground it. (I discuss further this kind of 'mediation' principle below.)

<sup>14</sup> One interesting option here for squaring the *Mediation* principle with physicalist primitivism is to make the sort of move than Russellian monists make when characterising (fundamental) physical properties in order to maintain that it lies in the nature of such properties to act as grounds (when instantiated) of the

the colours themselves have wholly qualitative natures, and hence that colour properties like being *F* in turn make no mention of the narrowly physical properties that serve as their grounds. Hence, when we look to the nature of the colour property *F* that is a constituent of the grounded fact [*F*(*a*)], we once again find nothing to explain the grounding connection (2) expresses. So physicalist primitivism looks to conflict with the attractive principle that grounding claims are mediated by the essences of the properties involved.<sup>15</sup>

Rather than undermining physicalist primitivism, however, I think that what the above really brings out is that colour primitivists who want to situate their view within a grounding physicalist framework must deny both (i) that grounding relations can obtain only in reductionist settings, i.e. when suitable real definitions can be given, and also (ii) that grounding relations must always be mediated by the essences of the properties involved. As a first step, note that there is independent motivation for denying these claims, insofar as there appear to be a range of coherent philosophical views that countenance *sui generis* irreducible properties that are nonetheless grounded in underlying properties of a different kind.<sup>16</sup> For instance, there is the view in the philosophy of mind that while phenomenal properties are exhausted by their phenomenal characters, such properties are nonetheless wholly and fully grounded in underlying physical properties. Second, there is the Moorean view in meta-ethics to the effect that whilst ethical properties are *sui generis* features that cannot be reduced to descriptive properties, they are nevertheless wholly and fully metaphysically grounded therein.<sup>17</sup> These examples, both due to Rosen (2010), are examples of views incompatible with both the idea that grounding claims must be backed by associated real definitions and with the somewhat more general idea that grounding relations must be somehow mediated by the essences of the properties involved. Hence one might think that even outside of the context of colour primitivism there is theoretical need to make space for non-reductive views which are nonetheless situated in a grounding framework.

To make room for such theories, we can appeal to grounding laws or principles that serve to connect the properties in the relevant grounding facts without recourse to essences or real definitions (cf. Moran, 2023b). On such a view, rather than being backed by essences or real definitions, at least some grounding relations obtain thanks to metaphysical principles or laws which specify that when a certain property *G* is instantiated, a certain higher-level property *F* is also instantiated for that reason. The physicalist primitivist would then insist that grounding relations like the one expressed by (2) above are not mediated by the natures of the properties involved,

---

relevant colour properties. This would then entail that the essences of such properties do in fact ‘make contact’ with the colour properties that they are the basic grounds of. For discussion of a view at least in this vicinity of this kind of position see Cutter (2018).

<sup>15</sup> One option here, which I lack space to explore in any detail, would be to insist that whenever some colour property *F* is grounded in some physical property *G*, while it lies neither in the nature of *F* nor *G* that this be so, it does lie in the collective or plural essence of *F* and *G*. For relevant discussion of this idea (in connection with the broader mind-problem) see Johnston (2023).

<sup>16</sup> Cf. Rydén (2022) who refers to these as ‘metaphysically opaque’ grounding relations. See also Moran, 2023b; Rosen, (2010): 131–133; and Schaffer (2017).

<sup>17</sup> For recent defences of this kind of view see Bader (2017); Fine (2002); and Rosen (2020).

nor by some associated real definition of the relevant colour property in terms of its physical grounds, but rather by grounding principles linking the physical properties involved in the grounding facts  $[\Gamma 1]$ ,  $[\Gamma 2]$ , ...  $[\Gamma n]$  with the colour property  $F$  involved in the grounded fact  $[F(a)]$ .<sup>18</sup>

Is the resulting view really a form of physicalism? It might be thought that it is not, since genuine physicalism requires what Goff (2017) calls ‘constitutive grounding’, where a fact  $A$  is constitutively grounded in a fact  $B$  just in case (i)  $A$  is grounded in  $B$  and (ii) a metaphysical analysis of the nature of  $A$  makes it transparent to us that whenever  $B$  obtains,  $A$  will obtain for that reason. The idea is that for a well-motivated and genuine form of physicalism, it isn’t sufficient to claim that the relevant class of facts (in our case, the colour facts) are grounded in underlying narrowly physical facts. In addition, we have to be able to see *how* this could be. When the conjunctive fact  $[A \& B]$  is grounded in the facts  $[A]$ ,  $[B]$ , it is transparent to us why this grounding relation holds: knowledge of the nature of the grounded fact is sufficient for us to be able to see that given that the individual conjuncts obtain, the conjunctive fact will obtain in virtue of them. On the view that I have proposed, however, even full knowledge of the nature of a given colour property would leave it opaque to us why a given instance of some colour property  $F$  should be grounded in certain more basic physical facts, even if such a grounding relation does obtain. The worry is that this leaves us with a theory that is poorly motivated and that does not genuinely deserve the appellation ‘physicalism’.<sup>19</sup>

In response, I would insist that even if the colour facts are not *constitutively* grounded in underlying physical facts, so long as they are grounded in such facts this is sufficient for us to end up with a genuine and well-motivated physicalist view. The thing to emphasise is that so long as a given colour fact  $A$  is wholly and fully grounded in some collection of narrowly physical facts  $X$ , this gives us excellent reason to think that  $A$  itself is a broadly physical fact, or at least that  $A$  itself is physicalistically kosher. So long as we can make sense of one fact being non-constitutively grounded in another (as I have already argued we can), the claim that colour facts are so grounded in physical facts generates a view on which the colour facts are wholly acceptable even from within a physicalistic point of view. And this is already sufficient motivation for taking the resulting view seriously.<sup>20</sup>

Here it is useful to consider some arguments that can be given for thinking that if the colours are grounded in underlying physical properties, then they themselves are broadly physical. It is my contention that these arguments are successful even given the specific view set out above that brings in grounding laws and which denies that physical-to-colour grounding relations are mediated by essential truths.

<sup>18</sup> For a more detailed account of this kind of non-reductive theory and more on the importance of bringing in grounding laws see Bader (forthcoming) and Moran (2023b). Cf. Rosen (2010: § 10).

<sup>19</sup> Thanks to an anonymous referee for pressing this objection. (A worry along similar lines is presented in Aleksiev, 2022 for the version of grounding physicalism defended in Schaffer, 2017).

<sup>20</sup> Cf. Schaffer (2017), who argues that although there might be an explanatory gap between the mental facts and the physical facts, such that even complete knowledge of the natures of both will leave it opaque how the physical generates the mental, nevertheless, the claim that mental facts are grounded in physical facts is a well-motivated physicalist view, which secures for mental facts a place in nature alongside other manifestly physical facts such as chemical and biological facts.

First, it is widely (and plausibly) held that grounded facts in some sense *consist in* the facts that ground them (cf. Fine, 2012; Goff, 2017: Ch. 1; Rosen, 2010).<sup>21</sup> Accordingly, a grounding physicalist view of primitive colours implies that primitive colour facts in some sense consist in the fundamental physical facts that serve as their ultimate metaphysical grounds. Plausibly, however, if any fact *X* consists in some array of fundamental physical facts  $\Gamma$ , then *X* itself is an (at least broadly) physical fact. Accordingly, in a grounding physicalist framework, we can make sense of the idea that primitive colours are (at least broadly) physical features, given that the grounding framework entails that instantiations of primitive colour properties will consist in instantiations of the fundamental physical properties that are their full and ultimate metaphysical grounds.

Second, it is widely maintained (again plausibly) that grounding relations serve to back a distinctive kind of metaphysical explanation.<sup>22</sup> Accordingly, the claim that primitive colours are grounded in fundamental physical properties ensures that a metaphysical explanation of the colour facts can be given in terms of the basic physical facts comprising the ground floor of being. Plausibly, however, any facts that can be metaphysically explained in terms of the fundamental physical facts should be reckoned as being themselves (at least broadly) physical. So colour facts will come out as (at least broadly) physical in a grounding physicalist framework, due to being metaphysically explainable in an appropriately physicalistic way.

Third, and finally, a grounding physicalist view of the colours serves to place colour facts right alongside various other manifestly (broadly) physical facts, such as the biological facts or chemical facts. In a grounding physicalist framework, all of these facts are derivative facts, ultimately grounded in the fundamental physical array. Since it is entirely reasonable to insist that the biological and the chemical facts (for instance) are (broadly) physical precisely by virtue of being grounded in the basic physical array, it is entirely reasonable to claim that colour facts, if these are also grounded in that same array, are (broadly) physical for the same reason.<sup>23</sup>

It is my contention that the resulting view, which situates colour primitivism in a grounding physicalist setting, is worthy of serious attention.<sup>24</sup> By way of further substantiating that claim, I want in what follows to consider, and respond to, a challenge to the coherence of this view, which turns on a modified version of Jackson's (1982) knowledge argument. On the one hand, this argument seems to support colour primitivism, insofar as it makes a compelling intuitive case for thinking that the colours

<sup>21</sup> For some specific proposals as to how to make metaphysical sense of the idea that grounding facts are nothing over and above their grounds see Werner (2023); Trogdon and Witmer (2021).

<sup>22</sup> Some philosophers hold that grounding is itself a relation of metaphysical explanation (so-called 'unionists'), others hold rather that grounding is a relation apt to back metaphysical explanation (so-called 'separatists'). I favour the latter view. See Raven (2015) for discussion.

<sup>23</sup> Need we not also insist that the relevant grounding laws themselves (linking high-level colour facts to fundamental physical facts) be grounded or explained? My own view is that this demand for explanation is misguided, or at any rate unnecessary for arriving at a genuine form of physicalism (or something near enough). I elaborate on this idea in Moran (forthcoming); cf. Schaffer, 2017.

<sup>24</sup> Granted, the proposed view might not give the physicalist everything she wanted, in particular not the reductive physicalist. For instance, certain explanatory gap style questions might be left open. On why this might not be a problem see Schaffer (2017). Cf. also fn. 20 above.

cannot be reductively identified with any physical features in the kind of way that non-primitivist theories of the colours require. However, for the physicalist primitivist, the argument appears to prove too much, since it seems also to rule out *any* physicalist view of primitive colours at all, including the non-reductive, ground-theoretic version of that view set out above. The next section sets this all out in more detail. The following section then suggests a way in which physicalist primitivist might try to ease the tension.

### 3 The knowledge argument

Consider a familiar story, due to Jackson (1982):

Mary is a brilliant scientist who is...forced to investigate the world from a black and white room via a black and white television monitor. She specialises in the neurophysiology of vision and acquires, let us suppose, all the physical information there is to obtain about what goes on when we see ripe tomatoes, or the sky, and use terms like ‘red’, ‘blue’, and so on. She discovers, for example, just which wave-length combinations from the sky stimulate the retina, and exactly how this produces via the central nervous system the contraction of the vocal chords and expulsion of air from the lungs that results in the uttering of the sentence ‘The sky is blue’. (1982: 30)

The case is standardly used to motivate an argument against physicalism. Mary knows all the physical information about what goes on when a person experiences red. Mary then leaves the room and experiences red for the first time. It seems plausible that Mary will thereby learn something new. As Jackson writes:

What will happen when Mary is released from her black-and-white room or is given a colour television monitor? Will she learn anything or not? It seems just obvious that she will learn something about the world and our visual experience of it. (1982: 130)

But this seems to imply that physicalism leaves something out. Mary could know all the physical facts involved in experiencing red, and yet learn something new upon experiencing red for the first time. Hence, it appears that the facts are not exhausted by the physical facts, which implies that physicalism is false.

As it is usually developed, the knowledge argument focuses on the idea that Mary would learn something new about our *experience* of red, namely about what experiencing red is like—the aim being to establish that red experiences instantiate non-physical ‘qualia’ and hence are non-physical events. Plausibly, however, Mary would also learn something novel about the colour red itself. In particular, she would learn what redness, the colour quality, is like. As we will see, this insight can be used to

motivate an argument for primitivism—an argument that also seems to tell against the idea that primitivism and physicalism can be coherently combined.<sup>25</sup>

The case for primitivism based on the Mary case is straightforward enough. When Mary leaves the room, and experiences red for the first time, it is plausible to think that she learns something new, something she could not have learned in the black-and-white room. Moreover, it is plausible to think that Mary learns something new about red itself. However, we also have the strong intuition that Mary knows all of the physical facts, and hence knew all about the full range of physical properties there are, even while still inside the room. As Jackson puts it:

It can hardly be denied that it is in principle possible to obtain all [the relevant] physical information from black and white television, otherwise the Open University would of necessity need to use colour television (1982: 30 cf. Russell: 1927: 289).

Accordingly, we can now argue for primitivism as follows. The colour red exists: it is the thing (or one of the things) whose nature Mary learns about for the first time when she leaves the room. That colour, however, cannot be identified with any physical property, or logical construction out of physical properties, or indeed with any of the usual candidates with which people have tried to reductively identify the colours. For, take any such candidate property *F*. Since *F* is one of the physical properties, Mary knew all about the nature of *F* even while she was still inside the room. However, she did not know all about the nature of red. Ergo, red and *F* are distinct. So, there is no property *F* with which red can be reductively identified, and likewise for all other colours. Therefore, colour primitivism is true.

So far, so good. The trouble, however, at least for those hoping to square primitivism with a more general commitment to physicalism, is that the Mary case can also be used to show that this ambition is futile. Let me explain.

Begin with the following basic version of the thought. The physicalist primitivist of the sort I have described thinks that colour facts are (at least broadly) physical facts, thanks to being grounded in the (narrowly) physical facts. But the knowledge argument says that Mary knew all of the physical facts, without knowing all of the colour facts. Hence, it implies that at least some colour facts are non-physical.

We can develop a more precise version of the concern as follows. Again, the primitivist thinks that colours are *sui generis* properties of external objects with a distinctive qualitative character. Accordingly, it is plausible for such theorists to say that what Mary learns when she first experiences red concerns the qualitative character of redness; or, in other words *what the colour red is qualitatively like*.

One way to capture this is to follow Kalderon in viewing the colours as possessing second-order qualitative properties of a sort that Mary might come to know only once she escapes the room and first experiences red. As Kalderon writes:

<sup>25</sup> While the colour red (as opposed to the associated phenomenal quality) is not the usual focus of the argument, for some relevant discussion see Coleman (2022) and Robinson (2016). Cf also Byrne (2006) and Johnston ([manuscript](#)).

Not only does perception present objects as colored, but perception also presents what these colors are like...The qualitative nature of the colors is manifest to us in our perception of them. Objects are perceived to instantiate color properties, and these color properties are perceived to instantiate higher-order properties that constitute their qualitative character. So, not only does color perception present the existence and distribution of the colors, but it also presents their nature. (Kalderon 2007: 563)

Suppose that Mary sees a red tomato when she leaves the room, thereby undergoing a red experience. What will she learn? In a primitivist framework, one of the things she will learn is what the colour red is like. We can model this by supposing that Mary comes to learn that the colour red instantiates some qualitative property  $Q$ . That is, we can suppose that Mary learns some fact  $\Delta$ , whereby  $\Delta$  is the true (Russellian) proposition  $[Q(r)]$ . (Notably, the qualitative property  $Q$  here stands to the colour red just as a quale or phenomenal property might stand to a token experience. Just as phenomenal properties characterise token experiences in terms of what they are like, so qualitative properties like  $Q$  characterise the colours by what they are like. I will rely on this point in the argument to follow.)

Now suppose we continue to grant that Mary knows, even inside the room, all of the physical facts concerning the colours and colour experience. If she also learns something new upon leaving the room, namely  $\Delta$ , it seems to follow that the physical information does not exhaust all the information that there is. In particular, it appears that there exist certain non-physical facts concerning the natures of the colours i.e. facts like  $\Delta$  (that red instantiates qualitative property  $Q$ ). But this undermines physicalism in any plausible form, since any physicalist view must entail that the set of physical facts exhausts all the facts there are.

Zooming out a little, the trouble we now face is that we have seemingly reached the following conclusion. On the one hand, the colour primitivist can motivate her view using (a version of) the knowledge argument. On the other hand, it seems that in order to do so, she must also concede that colour primitivism is not in fact compatible with any version of physicalism after all.

We can further develop the idea like so. Recall claim (2) above, namely:

$$(2) [F(a)] \leftarrow [\Gamma 1], [\Gamma 2], \dots [\Gamma n]$$

Suppose we read 'F' as denoting the colour red. We might also let 'a' name the particular red tomato Mary sees. The claim is then that the tomato is red in virtue of the obtaining of certain more basic physical facts  $[\Gamma 1], [\Gamma 2], \dots [\Gamma n]$ . And the idea is that the colour fact  $[F(a)]$  itself counts as broadly physical for that reason.

Consider now two claims. First, that if  $\Delta$  is a non-physical fact, then  $Q$  is a non-physical property. (Compare here the familiar idea that if facts about the instantiation of qualia are non-physical facts then qualia are non-physical properties.) And, second, that if  $Q$  is a non-physical property, then since  $Q$  is a higher-order feature of the colour red, facts about the instantiation of red cannot be grounded solely in underlying physical facts as per physicalist primitivism. After all, if the instantiation of redness by an object were wholly grounded in physical facts, then redness would

have to be a physical property with a wholly physical nature. But if qualitative property *Q* is non-physical, then redness does not have a wholly physical nature after all. (Compare here the idea that if qualia are non-physical properties, then experiences cannot be fully physical events, since no wholly physical event could instantiate a non-physical quale.) From these two claims, it follows that (2) cannot be true; more generally, facts about the instantiation of colours cannot be grounded in underlying physical facts; and, hence, the colours cannot be construed as broadly physical properties (nor colour facts as broadly physical facts).

How might the physicalist primitivist respond? The knowledge argument, of course, has been much discussed, and various replies have been developed. Notably, however, these replies are all instances of a common strategy (cf. Moran, 2023a), which involves accepting the first premise (that Mary could know all the physical facts in the black-and-white room) and denying the second (that Mary learns a genuinely new fact upon first experiencing red).<sup>26</sup> Moreover, it can be plausibly argued that none of these familiar strategies helps the physicalist primitivist.

After all, it would be dialectically a little odd for the primitivist to deny that Mary learns a genuinely new fact upon leaving the room. To take this line is to insist that when Mary judges ‘This is what red is like’, she states a fact that she already knew (perhaps under some other guise or mode of presentation) in the room. If that is right, however, then we can no longer lean on the Mary case to argue that colours are *sui generis* primitive properties. If learning what red is like is the sort of thing you can do from a black and white room, then red might well turn out to be a regular physical property, of the sort that reductionists (or dispensationalists) about the colours insist that it is.

In a colour primitivist framework, I think, it must be granted that Mary learns a genuinely new fact—not merely in the sense of coming to represent old information in new way, but rather in the sense of coming to know, for the first time, what the colour red is qualitatively like, by means of entertaining the true Russellian proposition [*Q*(*r*)], a proposition she was unable to entertain before she gained the relevant concept by means of leaving her chamber and undergoing an experience of red. The question is whether this can be granted even while retaining something like a physicalist view. I now outline a view on which it can.

## 4 Knowing the qualitative

Consider the following argument for colour primitivism:

1. For any candidate property *F* with which the colours might be reductively identified, Mary already knew all about the nature of *F* inside the room.
2. However, when Mary leaves the room, she learns something new about the qualitative nature of the colour red, which she did not already know before.

Hence,

<sup>26</sup> For details of these various strategies see Nida-Rümelin and O’Conaill (2021).

3. For no candidate property F with which the colours might be reductively identified is it the case that F is reductively identical with the colour red. I want to suggest a view that is compatible with the soundness of the above argument, but which can nonetheless resist the following further line of thought:
4. Mary knew all of the physical facts inside the room.
5. Mary learns a genuinely new fact (about the qualitative nature of red) when she escapes the room.  
Hence,
6. There are some non-physical facts, namely facts about the natures of the colours.

The view to be developed is that we can deny premise 4 of the second argument, consistently with accepting all of the premises of the first argument. The rest of this section explains how this might go.

It is a familiar empiricist thought that certain facts are knowable only on the basis of experience. In particular, it is a familiar empiricist thought that when it comes to the sensory qualities, the only way to learn about their natures is by sensing them. I submit, moreover, that this idea seems especially compelling in a colour primitivist setting. Suppose the colour red is as the primitivist claims: a simple qualitative property with a distinctive sensuous nature. It seems to follow that to know the nature of redness, one has to actually undergo a red experience. After all, how could one come to learn about the distinctive qualitative character of the (primitive) colour red, save by actually experiencing an instance of that colour?<sup>27</sup>

We might develop the idea like so. Qualitative properties, in general, are properties in relation to which ‘What is it like?’ questions make sense. The property of being red, on a primitivist conception at least, is a qualitative property because it makes sense to inquire what red *is like*. The thesis I am putting forwards (or perhaps better, which I am resurrecting from the old empiricist tradition) is that the natures of qualitative properties—and in particular their qualitative natures—cannot be known merely by discursive means. To know the nature of the quality, that quality must be experienced. This, I submit, is part of what it is for a property to be qualitative, for ‘what is it like’ questions to make sense regarding it.

As already indicated, I think reflection on the Mary story further supports this idea. Does Mary learn something new when she leaves the room? Plausibly, yes: she learns about the qualitative nature of redness; that is, she learns what red is like. Accordingly, she did not know this already inside the room. Why not? A natural thought is that she did not know this because (by hypothesis) whilst still inside she had not yet undergone an experience of red; yet, to know the qualitative nature of redness, one has actually to undergo an experience involving that quality. (Mutatis mutandis for all other qualitative properties, include the various colours.)

By way of further motivating this idea, consider the following issue that exercises Bishop Berkeley in the last of the *Three Dialogues*. On the one hand, given his religious scruples, Berkeley wants to allow that God is omniscient and hence could know all about the various sensory qualities, including even the more unpleas-

<sup>27</sup> Well, perhaps it is sufficient to *seem* to be presented with an instance of that colour, so that knowing what red is like only involves having an experience as of a red item. More on this below.

ant qualities such as pain. On the other hand, however, in line with his empiricism, Berkeley insists that knowing about the sensory qualities requires undergoing a suitable experience as of those qualities, so that knowing about the nature of pain, for example, requires actually experiencing pain. Taken together, these claims imply that God undergoes experiences of pain just as we do—and that seems to sit poorly with the idea that God is a perfect being. My present point is that however Berkeley might have wanted resolve this paradox, the second idea appears solid, at least in the case of qualities such as pain or the colours (at least if conceived on primitivist lines). To know about the natures of such qualities, one has to undergo a suitable experience involving those very qualities themselves.<sup>28</sup>

This suggests the following:

*Empiricist Thesis.* To know the qualitative nature of a colour one has to undergo a sensory experience as of that very colour.

Here, we can interpret ‘sensory experience’ broadly. Perhaps sensorily imagining the colour would be sufficient. Perhaps having a memory or quasi-memory of the colour would be sufficient. Perhaps hallucinating the colour would be sufficient. The main idea is just that in order to come to know what a colour is like one has to have a sensory experience as of that very colour. Notice also the locution ‘as of that very colour’. The idea is that in framing things this way, we can make room for the possibility that one could come to know what a colour is like by means of having an illusory experience as of that colour, which may or may not involve an actual instance of that colour being present to the mind.<sup>29</sup>

I think the Empiricist Thesis is attractive, certainly within a primitivist setting. I also think that it can do interesting work, insofar as it allows colour primitivists to square their view with physicalism, the above arguments notwithstanding.

Let us suppose, therefore, that the Empiricist Thesis is right. Then, Mary not only did not know  $\Delta$ , but could not have come to know it whilst still inside the room.<sup>30</sup> However, this need not mean that  $\Delta$  is non-physical. For there is room to claim that some genuinely physical facts, including  $\Delta$ , were simply not knowable by Mary until she escaped the room (cf. Moran, 2023a). In a grounding physicalist framework, in

<sup>28</sup> What about the thought that one could come to know what red is qualitatively like just by remembering (or quasi-remembering) that fact, and hence without having had the relevant experience? (Cf. Lewis 1998; Jackson, 1982, 1986). Suppose I learn that  $\Delta$  holds (i.e. that red has such and such a qualitative nature) on the basis of experiencing red. Then imagine some perfect intrinsic duplicate of me created ex nihilo: this being has never experienced red, but will, plausibly, at least be able to quasi-remember what red is like (on quasi-memory see Shoemaker, 1970). Could she not thereby learn what red is like on that basis? And does this not show that the Empiricist Thesis, as defined, is false? It isn’t obvious that this is right. To be sure, my duplicate might take themselves to be remembering what red is like. But when they say to themselves (or out loud) *this* is what red is like, would the demonstrative term ‘this’ have any content? It is at least a reasonable conjecture that since my duplicate has never seen the colour red, she is unable even to state the proposition I would utter using that same form of words, and, hence, that she unable to know that proposition.

<sup>29</sup> For an account on which whenever it appears as if one is aware of an instance of some colour, one really is aware of such an instance, see Moran (manuscript). For a quite different perspective on our knowledge of sensory qualities in illusory cases see Alford-Duguid (2020).

<sup>30</sup> Well, strictly speaking, Mary might have induced in herself a red experience by pressing hard on her closed eyelids (cf. Dennett, 2005) or self-inducing an hallucination (cf. Johnston, 2004). However, I will assume that we can set aside complications of this nature in what follows.

fact, of the sort set out earlier, we can explain exactly why such facts should classify as physical. For in that framework, facts about the colours, including  $\Delta$ , are metaphysically grounded in non-controversially physical facts, namely, the narrowly physical facts that constitute the metaphysical ground floor. Given, therefore, that any fact (wholly) grounded in physical facts must itself be (broadly) physical, we get the result that colour facts, including  $\Delta$ , classify as (broadly) physical even if such facts were not knowable by Mary whilst she was inside the room, due to only being knowable on the basis of sensory experience.

On the resulting view, while it is probably correct to say that, for any candidate physical property  $F$  with which redness might be identified, Mary already knew all about the nature of  $F$  inside the room, it is *mistaken* to say that Mary knew *all* of the relevant physical facts when inside the room. For there are higher-level (grounded) physical facts concerning the colours, such as the one that Mary learns when she sees red for the first time, that were not knowable inside the room.

The resulting view is importantly similar to the *subjective physicalist* response to the knowledge argument due to Howell (2007, 2008, 2009). According to Howell, phenomenal properties are physical properties, but they are also *subjective* properties in that the sense that they are knowable only on the basis of specific kinds of conscious experience. For instance, as Howell sees it, *phenomenal redness*, i.e. the mental property constitutive of undergoing an experience of red, is both a (broadly) physical property (supervenient on fundamental physical properties) and a subjective property whose nature is knowable only by means of instantiating it. On this account, Mary did not know the nature of this property in the room, since she had not yet instantiated it, but for all that it is a physical property, and hence Mary was while still inside the room deprived of genuinely physical information.<sup>31</sup>

In the same way, the present view insists that while colours are genuinely physical properties, they are subjective properties insofar as their natures are knowable only on the basis of actually experiencing them. However, one might worry that this is not ultimately a coherent position, at least in the case of primitive colours. Phenomenal properties, one might think, are perhaps plausibly construed as subjective. But colours, on a primitivist account, are meant to be objective properties of external objects (surfaces, volumes, and light sources) in the external world (cf. Allen 2016). So one might worry that the view I've recommended to the primitivist is not ultimately coherent, since it requires them to treat colours as being both objective qualities and also subjective qualities at the same time.

However, we can answer this worry by distinguishing between epistemic and metaphysical senses of the subjective/objective distinction. On the primitivist view, colours are objective in the metaphysical sense: they are aspects of an objective world which, to echo Stroud (2000) (echoing Williams, 1978) is *there anyway*, independently of human minds and their epistemic activities. But it is consistent with this to think that colours are also subjective in the epistemic sense, namely insofar as their natures are not completely knowable save to someone who has actually experienced the colour in question. On the proposed view, we need only think that colours are

<sup>31</sup> Cf. the views defended in Alter (1998); Crane, (2003, 2019); Flanagan (1992); Moran (2023a); Montero (2007).

subjective in the epistemic sense. So we can keep hold of the idea that colours are objective features of reality in the metaphysical sense.

We might clarify the idea with an analogy. Imagine that there are some items in a cave well below ground, with the following unusual property (which, moreover, they have essentially): these things are such that, whenever anyone gets close enough to them to learn what they are like, the person will lose all memory of that encounter, such that they will have forgotten all they learned by the time they exit the cave. (Perhaps the relevant essential property involves emission of an amnesia-inducing gas.) It follows that whenever anyone exits the cave, they will have forgotten whatever they learned about the natures of these weird objects. In some sense, then, it lies in the nature of these objects that they can only be known about except by seeing them; you can't learn about them from testimony, for example, for no one remembers what these things are like once they leave the cave (and there is no way to communicate to the outside world from within). I want to say that all of this is no barrier to supposing that there is a way these weird items are like quite independently of being seen. I want to say that it is similar with the colours. There is a way that red is like, and red exists and is that way even if no one ever sees it. Red has a qualitative nature, which is manifest to us when we perceive it, and this it has quite independently of being seen. To know what red is like, you have to have the right kind of red-involving experience. But it does not follow that the qualitative nature of red itself is in experience- or mind-dependent.

The colours, then, are epistemically subjective, in the sense that their natures can only be fully known on the basis of undergoing suitable kinds of sensory experience. In turn, this is a consequence of these properties being qualitative, that is, such that it makes sense to ask 'what is it like?' questions in relation to them. But these properties are nonetheless metaphysically objective, and in no way mind-dependent. When an object is red, it is a certain way, and it is that way independently of any mind. Likewise, red itself has a certain qualitative nature, a nature that it has quite independently of perceiving subjects and their activities.<sup>32</sup>

That said, there is a line of thought that puts pressure on this response. On the proposed view, colours are both physical phenomena and (metaphysically) objective phenomena: they are aspects of the objective physical world. One might argue, however, in line with Nagel (1986), that objective physical facts are precisely (all and only) those facts that are knowable by the objective methods of the physical sciences. On the present view, however, colour facts don't meet this constraint. So if Nagel is right about the conditions on being part of the objective physical world, we cannot plausibly count colour facts as part of objective physical reality after all.

In response, I would offer the following modification to Nagel's constraint on physicality. Rather than saying that a fact is physical only if knowable by the objective methods of the physical sciences, we can instead offer a disjunctive account

---

<sup>32</sup> Might it not be said that all properties are the same in this respect? Only if all properties have a sensible aspect that can be revealed only subjectively, i.e. by means of sensory experience. But surely that is not a plausible idea. Perhaps some other properties besides the colours are epistemically subjective while being metaphysically objective in the relevant sense—I am inclined to think that manifest or qualitative shape (as opposed to quantitative or physical shape) along these lines. (For this important but neglected distinction see Broad, 1925: 170ff and Johnston manuscript.)

of physicality, such that a fact is physical only if either (i) it is a fundamental fact read off from our best physical science (and hence knowable by objective scientific means) or else (ii) metaphysically grounded therein (cf. fn. 8). In this framework, the facts that meet condition (i) will be fundamental physical facts, whilst the facts that meet condition (ii) will be derivative physical facts. The colour facts can then be counted among the derivative physical facts, and hence will classify as being part of objective physical reality after all, the *Empiricist Thesis* notwithstanding.

## 5 Conclusion

Colour primitivists think of colours as *sui generis* qualitative properties of items in the external world. In this paper, I've argued that colour primitivists can also be physicalists, by situating their theory of the colours within a broader grounding physicalist framework. On this account, the colours are derivative physical items that are metaphysically grounded in more basic physical phenomena.

I've also argued that this view faces a dilemma. For while a version of Frank Jackson's knowledge argument appears to motivate primitivism in general, that argument seems also to undercut the idea that primitivism can be situated in a grounding physicalist framework. By way of resolving the tension, I've argued, colour primitivists should adopt a view on which certain derivative physical facts, including facts about the qualitative natures of the colours, are knowable only on the basis of sensory experience. On the resulting view, while colour facts are subjective in the epistemic sense, colours themselves are nonetheless parts of the objective physical world, albeit derivative such parts wholly grounded in whatever basic physical phenomena serve to characterise the fundamental level of reality.

**Acknowledgements** An ancestor of this paper was presented at the University of Warsaw. Thanks to the audience members on that occasion. Special thanks to Dominic Alford-Duguid, Mikolaj Slawkowski-Rode, and Ralph Weir for helpful discussion. This research was backed by a post-doctoral research grant from the Swiss National Science Foundation and a VR grant from the Swedish Research Council. My thanks to these institutions and funding bodies for their support.

**Funding** Open access funding provided by University of Fribourg  
This work was supported by funding from the Swiss National Science Foundation and the Swedish Research Council.

## Declaration

**Competing interests** The author has no relevant financial or non-financial interests to disclose.

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>

[ses/by/4.0/](#).

## References

- Aleksiev, D. (2022). Lightweight and heavyweight Anti-Physicalism. *Synthese*, 200(112), 1–23.
- Alford-Duguid, D. (2020). Thinking Through Illusion. *European Journal of Philosophy*, 28(3):617–638.
- Allen, K. (2016). *A naïve realist theory of colour*. Oxford University Press.
- Alter, T. (1998). A limited defense of the knowledge argument. *Philosophical Studies*, 90(1), 35–56.
- Armstrong, D. M. (1964). *Perception and the physical world*. Humanities.
- Audi, P. (2012). A clarification and defense of the notion of grounding. In F. Correia, & B. Schnieder (Eds.), *Metaphysical grounding: Understanding the structure of reality* (pp. 102–121). Cambridge University Press.
- Bader, R. M. (2017). The grounding argument against Non-Reductive moral realism. *Oxford Studies in Metaethics*, 11, 106–134.
- Bader, R. M. (forthcoming). Grounding, reduction and analysis. In Moran, A. & Rossi, C. (Eds.), *Objects and Properties*. Oxford University Press.
- Broad, C. D. (1925). *The mind and its place in nature*. Routledge.
- Byrne, A. (2006). Colour and the Mind-Body. *Problem 'Dialectica*, 60(3), 223–244.
- Campbell, J. (1997). A simple view of color. In J. Haldane, & C. Wright (Eds.), *Reality, representation and projection* (pp. 257–269). Clarendon.
- Campbell, J. (2005). Transparency vs. Revelation in color perception. *Philosophical Topics*, 33(1), 105–115.
- Chalmers, D. (1996). *The conscious Mind*. Oxford University Press.
- Chalmers, D. (2006). Perception and the fall from Eden. In T. Szabó, Gendler, & J. Hawthorne (Eds.), *Perceptual experience* (pp. 49–125). Oxford University Press.
- Coleman, S. (2022). Fred's red: On the objectivity and physicality of mental qualities. *Synthese*, 200(4):1–27.
- Crane, T. (2003). Subjective facts. In H. Lillehammer, & G. Rodriguez Pereyra (Eds.), *Real metaphysics* (pp. 68–83). Routledge.
- Crane, T. (2019). The knowledge argument is an argument about knowledge. In S. Coleman (Ed.), *The knowledge argument* (pp. 15–31). Cambridge University Press.
- Cutter, B. (2018). Paradise regained: A Non-Reductive realist account of the sensible qualities. *Australasian Journal of Philosophy*, 96(1), 38–52.
- Dasgupta, S. (2014). The possibility of physicalism. *Journal of Philosophy*, 111(9–10), 557–592.
- Dennett, D. (2005). *Sweet dreams: Philosophical obstacles to a science of consciousness*. MIT Press.
- Dorsey, J. E. (2016). On the Ground-Reduction link. *American Philosophical Quarterly*, 53(4), 411–422.
- Fine, K. (2002). The varieties of necessity. In T.S. Gendler & J. Hawthorne (Eds.), *Conceivability and possibility* (pp. 253–281). Oxford University Press.
- Fine, K. (2012). Guide to ground. In F. Correia & B. Schnieder (Eds.), *Metaphysical grounding: Understanding the structure of reality* (pp. 37–80). Cambridge University Press.
- Flanagan, O. (1992). *Consciousness reconsidered*. MIT Press.
- Foster, J. (1982). *The case for idealism*. Routledge.
- Gert, J. (2006). A realistic color realism. *Australasian Journal of Philosophy*, 84, 565–589.
- Gert, J. (2008). What colors could not be. *The Journal of Philosophy*, 105, 128–155.
- Goff, P. (2017). *Consciousness and fundamental reality*. Oxford University Press.
- Hattiangadi, A. (2018). Moral supervenience. *Canadian Journal of Philosophy*, 48(3/4), 592–615.
- Horgan, T. (1993). From supervenience to superdupervenience: Meeting the demands of a material world. *Mind*, 102, 555–586.
- Horgan, T. (2006). Materialism: Matters of definition, defense, and Deconstruction. *Philosophical Studies*, 131, 157–183.
- Howell, R. (2007). The knowledge argument and objectivity. *Philosophical Studies*, 135, 145–177.
- Howell, R. (2008). *Consciousness and the limits of objectivity*. Oxford University Press.
- Howell, R. (2009). The Ontology of Subjective Physicalism. *Noûs*, 43(2): 315–345.
- Jackson, F. (1982). Epiphenomenal qualia. *The Philosophical Quarterly*, 32(127), 127–136.
- Johnston, M. (2004). The obscure object of hallucination. *Philosophical Studies*, 120(1/3), 113–183.

- Johnston, M. (2023). Surviving death, again. *Theo-Logica: An International Journal for Philosophy of Religion and Philosophical Theology*. <https://doi.org/10.14428/thl.v8i2.82033>.
- Johnston, M. (forthcoming) The property mistake. In A. Moran & C. Rossi (Eds.), *Objects and Properties: New Essays in Metaphysics and Ontology*. (Oxford University Press).
- Johnston, M. (manuscript). *The Manifest*, m.s. draft.
- Kalderon, M. E. (2007). Color pluralism. *The Philosophical Review*, 116(4), 563–601.
- Kim, J. (1993). *Supervenience and Mind: Selected philosophical essays*. Cambridge University Press.
- Lee, A. Y. (2014). A defence of sense-data. *Analytic Philosophy*. (Forthcoming).
- McGinn, C. (1996). Another look at color. *The Journal of Philosophy*, 93, 537–555.
- Montero, B. (2007). Physicalism could be true even if Mary learns something new. *Philosophical Quarterly*, 57(227), 176–189.
- Moran, A. (2023a). Grounding Physicalism and the Knowledge Argument, *Philosophical Perspectives: A Supplement to Noûs*. <https://doi.org/10.1111/phpe.12190>
- Moran, A. (2023b). Grounding Physicalism and ‘Moorean’ Connections, *Inquiry*. <https://doi.org/10.1080/0020174X.2023.2253863>.
- Moran, A. (forthcoming). Contingent Grounding Physicalism. *Analytic Philosophy*. (In press).
- Moran, A. (manuscript). Colour illusion and objective looks. M.S. draft.
- Nagel, T. (1986). *The view from nowhere*. Oxford University Press.
- Nida-Rümelin, M., & O’Conaill, D. (2021). Qualia: The knowledge argument. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy*. <https://plato.stanford.edu/archives/sum2021/entries/qualiaknowledge/>
- Raven, M. J. (2015). Ground. *Philosophy Compass*, 10(5), 322–333.
- Robinson, H. (2016). *From the knowledge argument to mental substance: Resurrecting the mind*. Cambridge University Press.
- Rosen, G. (2010). Metaphysical dependence: Grounding and reduction. In B. Hale, & A. Hoffmann (Eds.), *Modality: Metaphysics, logic, and epistemology* (pp. 109–136). Oxford University Press.
- Rosen, G. (2020). What is normative necessity? Mircea Dumitru (Ed.) in *Metaphysics, meaning, and modality: Themes from Kit Fine* (pp. 205–233). Oxford University Press.
- Russell, B. (1927). *The Analysis of Matter*. Kegan Paul.
- Rydehn, H. (2022). Metaphysically opaque grounding. *Canadian Journal of Philosophy*, 52(7):729–745. <https://doi.org/10.1017/can.2023.11>
- Schaffer, J. (2017). The ground between the gaps. *Philosophers’ Imprint*, 17, 1–26.
- Schaffer, J. (manuscript). Naturalistic dualism and the problem of the physical correlate. Manuscript draft.
- Sethi, U. (2023). Sensible individuation. *Philosophy and Phenomenological Research*, 107, 168–191.
- Shoemaker, S. (1970). Persons and their pasts. *American Philosophical Quarterly*, 7(4), 269–285.
- Stoljar, D. (2010). *Physicalism*. Routledge.
- Stroud, B. (2000). *The quest for reality: Subjectivism and the metaphysics of colour*. Oxford University Press.
- Trogon, K., & Witmer, D. (2021). Full and partial grounding. *Journal of the American Philosophical Association*, 7(2), 252–271.
- Watkins, M. (2005). Seeing red: The metaphysics of colour without The physics. *Australasian Journal of Philosophy*, 83(1), 33–52.
- Werner, J. (2003). Partial grounding, identity, and nothing-over-and-aboveness. *Philosophical Studies*, 180, 3489–3509.
- White, B. (2018). Metaphysical necessity dualism. *Synthese*, 195(4), 1779–1798.
- Wildman, N. (2018). On shaky ground: Exploring the contingent fundamentality thesis. In R. Bliss & G. Priest (Eds.), *Reality and its structure: Essays in fundamentality*. Routledge.
- Williams, B. (1978). *Descartes: The project of pure inquiry*. Routledge.
- Wilson, J. (2005). Supervenience-based formulations of physicalism. *Noûs*, 39(3), 426–459.

**Publisher’s note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.