RECENT WORK

Physicalism

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As a first pass, *physicalism* is the doctrine that *there is nothing over and above the physical*. Much recent philosophical work has been devoted to spelling out what this means in more rigorous terms and to assessing the case for the view. What follows is a survey of such work. I begin by looking at competing accounts of what is meant by *nothing over and above* (§1) and then turn to how *the physical* should be understood (§2). Once we are clear on the options for formulating the physicalist thesis, we will look at the leading argument for the view (§3). Along the way, I will suggest avenues for further exploration.

1. Nothing over and above

The primary motivation for including the *nothing over and above* clause in the statement of physicalism is the thought that physicalism should be consistent with the existence of entities that are not on their face physical, even entities that are irreducible to physical entities in some important sense, provided such entities depend on and are determined by physical entities in the right way. Indeed, *nonreductive physicalism* is plausibly the leading version of physicalism today, with contemporary authors still frequently referring back to classic defences like Putnam (1967), Davidson (1970) and Fodor (1974). To be sure, nonreductive physicalism has its critics, like Kim 1998 and Polger and Shapiro 2016. But we should not want the definition of 'physicalism' to rule out the view prior to substantive argument, and so the question is how to make sense of *nothing over and above* in a way that allows for such nonreductive but nevertheless physicalist views.[1]

1.1 Supervenience

For years, the standard response to this question appealed to *supervenience* (Davidson 1970; Lewis 1983; Kim 1993; Chalmers 1996; Jackson 1998).

1 This marks a break with Stoljar (2010: 160–62), who describes the debates over nonreductive physicalism as 'misguided'. I think Stoljar's view on this is mistaken and idiosyncratic but will not try to engage it directly here.

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Here is one example of how to develop a supervenience-based formulation of physicalism, due to Jackson (1998).

> [Supervenience]: Physicalism is true just in case any logically possible world that is a minimal physical duplicate of the actual world is a duplicate *simpliciter* of the actual world.

A *minimal* physical duplicate of a world, w, is a world that is physically indiscernible from w and that contains nothing more than what it needs to by virtue of being physically indiscernible – so, for instance, no Cartesian souls or ghosts or ectoplasm if w lacks them.

To see why such an approach seemed promising, consider two different views about phenomenal consciousness. First, a standard role-functionalist holds that conscious properties are not identical with physical properties but instead are second-order (functional) properties that supervene on physical properties with logical necessity. Such a role-functionalist qualifies as a physicalist according to [Supervenience]: the functional properties she posits are not physical, but they are nothing over and above physical properties, since they supervene. In contrast, property dualists like Jackson (1982) and Chalmers (1996, Ch. 4) hold that conscious properties do not supervene on physical properties with logical necessity and so are classified as rejecting physicalism according to [Supervenience].[2] We are getting the right results.

It is generally agreed that the supervenience of everything on the physical is a necessary condition for physicalism – although see Montero 2013 for an argument to the contrary. The debate has focused instead on whether it is also sufficient. One especially influential argument that it is not maintains that what physicalism requires is not just such supervenience but in addition that the obtaining supervenience relations be explainable in a physicalistically acceptable way rather than brute (Horgan 1993; Kim 1993: 167, 1998: Ch. 1; Wilson 1999, 2005; Melnyk 2003).

Two examples are often used to illustrate the idea. First, Moore's (1903) meta-ethical non-naturalism takes moral properties to supervene on natural properties (we can suppose: physical properties) with apparent logical necessity, and yet surely the view is inconsistent with physicalism. Horgan (1993, 2006) discusses the case at length, but see also Polger 2013, who contends that while Moore's non-natural properties are physicalistically unacceptable, his brute supervenience relations are not.

Second, classic emergentist views of the mind (McLaughlin 1992), perhaps especially if combined with a necessitarian view of laws (Wilson 2005), are paradigmatically anti-physicalist and yet take (or at least can take) mental properties to supervene on physical properties with logical necessity. But see

2 Such anti-physicalists hold that conscious properties supervene on physical properties with nomological or natural necessity, however; see Chalmers 1996: 34–38.

Howell 2009, who defends the supervenience approach from this putative counterexample.

In response to this line of criticism, several philosophers in recent years have sought some stronger and more explanatory relation than supervenience in order to analyse *nothing over and above*.

1.2 A priori *entailment*

One option to consider here is *a priori entailment*. In the relevant sense of entailment, one class of truths entails another just in case in any logically possible world in which the first class obtain, the second class obtain. An entailment is said to be a priori if it is knowable a priori. Then here is a proposal:

> [A Priori Entailment]: Physicalism is true just in case the class of all actual physical truths (together with a totality truth) a priori entail all truths.[3]

This would rule out the emergentist scenario considered above: even if the physical truths entail emergent mental truths, in the given sense of entailment, such entailments are not knowable a priori.[4]

The response to this sort of proposal is the opposite of what we saw with [Supervenience]: it is not much disputed that such a pattern of a priori entailment would be sufficient for the truth of physicalism, but many deny it is necessary. In particular, there are so-called *a posteriori physicalists* who grant that the physical truths entail all truths but maintain that such entailments are knowable only a posteriori (see, for instance, Block and Stalnaker 1999; McLaughlin 2007a; Diaz-Leon 2010, 2011; Elpidorou 2016).

The view is often motivated by reflecting on certain epistemic arguments against physicalism. So, for instance, a posteriori physicalists typically respond to Chalmers's (1996) *conceivability argument* by maintaining that the proposition that there are zombies – beings physically indiscernible from us but lacking phenomenal consciousness – is conceivable but impossible, where a proposition is conceivable just in case its negation is not knowable a priori. Or they respond to Jackson's (1982) *knowledge argument* by conceding that comprehensive knowledge of physical truths would not by itself position one to infer phenomenal truths, while denying that this epistemic point supports dualism or otherwise has any metaphysical import.

3 The *totality truth* states roughly that there are no *positive truths* beyond those that obtain by virtue of the physical truths obtaining; see Chalmers 2012: 151–56 and Tiehen 2014 for discussion of how to formulate such a truth. In what follows, I will omit further explicit mention of the totality truth. It may be that we also need to add indexical truths to the entailment base, but this is a complication I will ignore.

4 However, the proposal seems to mishandle the non-naturalism case. If non-natural moral truths are knowable a priori, perhaps via a faculty of rational intuition, then they are trivially a priori entailed by the physical truths.

Some philosophers deny the tenability of a posteriori physicalism. For discussion of the issues involved see, for instance, Jackson 1998, 2006, 2007; Stoljar 2000; Chalmers and Jackson 2001; Witmer 2006; Montero 2007; Dowell 2008; Goff 2011; Howell 2015; Tiehen 2016. Without trying to settle the debate here, the following seems prima facie plausible.

Even if you think a posteriori physicalism is ultimately untenable, this is something to be established through substantive argument, not built into the definition of physicalism. Indeed, since physicalism is a metaphysical rather than epistemological thesis, any attempt to analyse it in epistemic terms like a priori knowability is on the wrong path. Perhaps, the correct metaphysical analysis of *nothing over and above* will have epistemic implications, including implications for a priori entailment. But even if this is so, the analysis itself should be purely metaphysical.

1.3 Realization

So consider another alternative. Several philosophers have responded to the perceived failures of supervenience-based analyses of *nothing over and above* by turning to the notion of *realization* familiar from discussions of functionalism and multiple realization. Competing accounts of realization have been developed.

Melnyk (2003) understands realization in terms of functional types. A type *F* is functional when it is associated with some condition *C* such that, necessarily, *F* is tokened just in case there is some token of a type *G* that meets *C*. When this occurs, the *G* token is said to realize the *F* token. With this account of realization in place, Melnyk proposes something close to the following:

> [Realization]: Physicalism is true just in case every entity is either physical or realized by a physical entity.[5]

Alternatively, [Realization] could be understood using the *subset account of realization* developed in different ways by Wilson (1999, 2005, 2011), Shoemaker (2001, 2007), Clapp (2001) and Watkins (2002). Here, the core idea is that one property (or perhaps property instance) realizes another just in case the causal powers of the realizee are a proper subset of those of the realizer.

Yet, other views of realization have been developed by other authors (see, for instance, Gillett 2002, 2003; Endicott 2012; Polger and Shapiro 2016). Not all recent work on realization explicitly engages the question of how to formulate physicalism, however, and so I want to allow that some views may fall outside the scope of our discussion here.

The realizationist analysis of *nothing over and above* has several things going for it. Realization relations seem to entail that and explain why

5 Melnyk (2003: 11) restricts the scope of the physicalist claim so that it does not apply to necessarily existing non-causal entities, like numbers. But we will ignore this here.

supervenience relations obtain. In connection, the approach seems to handle properly the non-naturalism and emergentism cases that pose a problem for [Supervenience]. And all of the leading accounts treat realization as a purely metaphysical relation, thus avoiding the sort of epistemic intrusion we saw with [A Priori Entailment]. Before we get too pleased with ourselves for having settled a philosophical question, however, let us consider a fourth and final view.

1.4 Grounding

Contemporary metaphysics is in the midst of a *grounding* revolution, marked by an intense interest in the form of metaphysical dependence that obtains between the comparatively fundamental and the derivative when the latter obtains *in virtue of* the former obtaining (Fine 2001, 2012; Schaffer 2009; Rosen 2010; Audi 2012; Clark and Liggins 2012; Dasgupta 2014; Elpidorou 2017). Grounding is often taken to be metaphysically primitive, in which case no analysis of it is available. But authors advance claims about its formal features – for example, perhaps it should be understood as an irreflexive, asymmetric, transitive, hyperintensional relation that can obtain between entities of any sort. And paradigmatic examples are given – in Fine's famous case, the existence of Socrates grounds the existence of the singleton set {Socrates} but not vice versa.

Several authors have regarded the formulation of physicalism as an obvious place where grounding might be put to work. So, consider:

> [Grounding]: Physicalism is true just in case every entity is either physical or grounded in physical entities.

Now, grounding champions are often explicit about their reasons for preferring their approach to [Supervenience] or [A Priori Entailment]. But what about [Realization]? Here such philosophers have not yet said enough – indeed, they often say nothing at all about the realizationist view. Is realization simply grounding by another name, or perhaps a determinate form of grounding? One reason to think not is that while grounding is primitive, leading accounts take realization to be analysable – for instance, on the subset account it can be analysed in terms of causal powers and sets thereof. If [Grounding] and [Realization] are competitors, this point presumably counts as an advantage of the realizationist approach: other things being equal, we should prefer a formulation of physicalism that does not require new primitives.

In addition, as both Wilson (2014, 2016) and Melnyk (2016) observe, it is not clear that [Grounding] properly handles the cases that motivated the initial rejection of [Supervenience]. For example, Rosen (2010: 132–33) proposes that a Moorean can take non-natural moral facts to be grounded in natural (suppose: physical) facts. Even aside from Rosen's specific view, it seems correct that in some sense of the (vague) phrase, the Moorean can

agree that non-natural moral facts hold *in virtue of* natural (physical) facts. But if the Moorean can accept such grounding claims, [Grounding] fails as an analysis of physicalism.

Cutting in the opposite direction, you might suspect that realizationist approaches come with metaphysical commitments that grounding theorists are able to avoid. For example, some have thought the subset account requires an objectionable view of properties and powers (see McLaughlin 2007b; Baltimore 2013; Morris 2013; Pineda and Vicente 2017). And you might doubt whether mental or order higher order types can be functionally defined in the way Melnyk's account requires.

At any rate, the realization/grounding divide seems like a promising avenue for further exploration in the years ahead. For now perhaps the thing to say is philosophers have made progress on analysing *nothing over and above* without yet settling on a universally accepted approach.

2. *The physical*

Now to the other portion of the physicalist slogan that there is nothing over and above the physical – just what is meant by *the physical*?

2.1 *The theory view*

The natural place to start is with the *Theory View*, which says *the physical* should be understood in terms of the theories of the science of physics. Here is one way to develop this thought.

> [Theory]: An entity is physical just in case it is denoted by a theoretical term of physics.

So, for instance, mass, charge, angular momentum and so on, all count as physical entities according to [Theory].

The Theory View is perhaps the most common approach to defining *the physical* (see Lewis 1983; Chalmers 1996, 2012; Melnyk 1997, 2003; Ney 2008a; Stoljar 2010, Ch. 4; Witmer 2016). But the position faces a challenge posed by *Hempel's dilemma* (Hempel 1969, 1980). The dilemma concerns just how 'physics' is to be understood in [Theory]. If it is taken to mean *current* physics, the resulting physicalist doctrine is likely false since current physics is presumably incomplete. But if it is taken to mean some *future* or *ideal* physics, the resulting physicalist doctrine is empty since nobody knows what a future or ideal physics might contain.

Some authors have taken the dilemma (or broadly similar considerations) to pose an insuperable challenge for physicalism, showing there is no interesting and plausibly true physicalist thesis to be had (Crane and Mellor 1990; Chomsky 1995 and the discussion in Montero 1999). Some embrace the dilemma's first horn, maintaining that current physics is the way to proceed (Melnyk 1997, 2003; Bokulich 2011; Vicente 2011). Some embrace the

second, arguing that the appeal to a future or idealized physics need not be empty (Poland 1994; Dowell 2006; Witmer 2016). And some say physicalism needs to be reconceived as a stance or attitude rather than a hypothesis (Van Fraassen 2002; Ney 2008b).

Instead of examining any of these options at length or assessing their merits, I want to focus on another potential response to the dilemma: rejecting [Theory] in favour of an alternative conception of *the physical*.

2.2 *The via negativa view*

One way to bypass Hempel's dilemma is by dropping the reference to physics and instead defining *the physical* in terms of *what it is not*, where the idea especially is that the physical is not mental (Spurrett and Papineau 1999; Papineau 2001; Spurrett 2001; Montero 2001; Montero and Papineau 2005; Wilson 2006; Worley 2006; Tiehen 2016). Here is an initial attempt to formulate such a *Via Negativa View*.

> [Via Negativa]: An entity is physical just in case it is not mental.

This pleasingly straightforward proposal does not work, however. For one thing, it mishandles the threat to physicalism posed by non-mental entities. For instance, Moore's non-natural moral properties are not mental and so are classified as physical by [Via Negativa] – the wrong result. For another, as Stoljar (2010: 87) observes, the proposal mishandles psychophysical identity theories. Such theories say that certain entities (properties, events, etc.) are both mental and physical. But on [Via Negativa], this amounts to saying those entities are both mental and not mental – a contradiction. Perhaps, such identity theories are objectionable, but surely their incoherence cannot be established this easily.

Maybe the thing to do is move away from a formulation like [Via Negativa] and in the direction of Wilson's (2006) *no fundamental mentality* constraint. The rough idea is that physicalism should allow non-fundamental physical properties to be mental but rule out the instantiation of fundamental mental properties. Tiehen (2016) develops Wilson's idea along different lines, taking a property to be physical just in case it is not fundamentally mental.

Before engaging in further comparison of the views, it will be helpful to have our last remaining account of *the physical* on the table.

2.3 *The object view*

We possess an intuitive concept of a *physical object*, where paradigmatic instances include things like tables and chairs, rocks and mountains. Some philosophers have tried to draw on this concept to define *the physical* (Jackson 1998; Stoljar 2001, 2010; Strawson 2006). Consider the following.

> [Object]: An entity is physical just in case it is the sort of entity that figures in a complete account of the intrinsic nature of objects

like tables and chairs, rocks and mountains (i.e., paradigmatic physical objects).

Part of the appeal of this *Object View* is that it seems to be a guiding idea of physicalism that humans *aren't special* (cf. Witmer 2016): our minds are realized by (or grounded in, etc.) the same sorts of entities that make up tables and chairs, rocks and mountains. [Object] captures this.

The Object View comes with its own set of problems however. Among them, it seems to classify as nonphysical various entities that are not ordinary physical objects, but nevertheless are such that no self-described physicalist objects to them, like gravitational forces or quantum mechanical wave functions (see Stoljar 2010: 60–62, Montero 2012 and Witmer 2016, §1.1). But given limitations of space, let's focus on how it interacts with a family of unconventional mind–body views that have received much attention in recent years, a family that includes *panpsychism* and *Russellian monism* (Chalmers 1996, Rosenberg 2005, Strawson 2006, Skrbina 2009, Alter and Nagasawa 2015 and Goff 2017). Whether these views are consistent with physicalism partly depends on what is meant by *the physical*.

To illustrate, consider a view on which everything that exists is made up of the same sorts of fundamental entities, and these entities all have phenomenal intrinsic natures that are inscrutable to physics. Human consciousness is realized by (or grounded in, etc.) the intrinsic phenomenal properties of the particles that make up human bodies. Is this a physicalist position?

YES, according to [Object]. For the same entities that make up humans also make up tables and chairs, rocks and mountains. Consciousness is more prevalent than we thought, but this just underscores the point that humans aren't special with respect to consciousness.

MAYBE, according to [Theory], depending on further metaphysical and semantic details. Suppose the theoretical terms of physics have functional definitions (Lewis 1970), so that, for instance, 'electron' denotes whatever property occupies the electron role. And suppose the occupants of all the given functional roles are phenomenal properties. These phenomenal properties will then qualify as physical, on [Theory], even on the assumption their phenomenal natures are not revealed by physics – that is, even on the assumption that the given functional definitions are neutral on the intrinsic natures of the properties denoted. That said, there are other ways of spelling out the metaphysical and semantic details so that this inscrutability to physics may be incompatible with such properties qualifying as physical on the Theory View. Hence the MAYBE verdict.

NO, according to those versions of the Via Negativa View that endorse Wilson's (2006) *no fundamental mentality* constraint. For the panpsychist view described posits fundamental phenomenal (mental) properties.

Some philosophers take the preceding to count in favour of the Object View. They see panpsychism as opening up a promising way for physicalists

to understand consciousness. Others draw the opposite conclusion. Physicalism should be a sober, hard-headed position that rules out zaniness like panpsychism, and so what we see here is the inadequacy of [Object], they say. Without trying to settle this dispute, I close the section by suggesting there is room for further work on the topics involved.

3. *The case for physicalism*

Now that we have seen some of the options for formulating the physicalist thesis, what is the case to be made for the view? While various different arguments have been advanced, the most influential is surely the *causal argument for physicalism* (Lewis 1966, Davidson 1970, Papineau 2001, Melnyk 2003 and Stoljar 2010, Ch. 11). We will make it our focus here.

3.1 *Formulating the argument*

Here is one version of the argument, inspired by Papineau (2001).

[P1]: Any physical event that has a cause at a time *t* has a sufficient physical cause at *t*.

[P2]: The physical effects of mental causes are not all causally overdetermined.

[P3]: All mental events have physical effects.

[C]: Mental events are identical with physical event.

The idea: mental events must be physical if they are to causally interact with the physical world in the way we think they do.

This particular formulation focuses on mentality, but the argument can be straightforwardly extended to apply to chemistry, biology or any other domain taken to have physical effects. It cannot be extended to putatively non-causal realms, however. So, if instances of Moore's non-natural moral properties are not meant to be causes – because they concern only how things ought to be, not how they are, suppose – the causal argument has no purchase on them. Papineau (2001) endorses this result, taking it to reflect a proper limit on the ambitions of physicalism. But other philosophers – including those who reject [Supervenience] at least partly because it mishandles non-naturalism – will be dissatisfied with this. Perhaps they can supplement the causal argument and reject Moorean non-naturalism on some other grounds.

3.2 *Nonreductive physicalism and mental causation*

The causal argument's conclusion that mental events are identical with physical events entails that mental properties are identical with physical properties if we hold with Kim (1993: 33–52) that events just are property exemplifications. Papineau (2001, 2013) welcomes this reductionistic result, as would

Kim (1998). But it raises the question of whether nonreductive physicalists can endorse some version of the causal argument without undermining their own view. Perhaps the causal considerations at play here don't speak just in favour of physicalism generally but support a reductive form of physicalism more specifically.

There is a mountain of work by nonreductive physicalists attempting to show that this is not so; see Gibb 2014 for a survey covering much of it. But just to get a sense of the challenges in the area, see Judisch 2009 and O'Connor and Churchill 2009, who flip the familiar narrative by arguing that causal considerations ultimately support anti-physicalist views by ruling out the most attractive (nonreductive) version of physicalism. And see Stoljar and List (2017), who contend that dualists can co-opt the most promising nonreductive physicalist accounts of mental causation, thereby inoculating dualism from the causal argument for physicalism.

3.3 The empirical defense of causal closure

There are overdeterminationists who reject [P2] of the causal argument, and epiphenomenalists who reject [P3]. But let's focus on the *Causal Closure* premise, [P1]. Why accept it? The most influential defences are empirical. Indeed, it is here that, for many philosophers, physicalism stakes its claim to being better supported by science than its competitors.

One empirical line of argument in favour of Causal Closure appeals to the *conservation laws of physics* (Papineau 2001; Vicente 2006; Montero 2006; Koksvik 2007; Gibb 2010). The idea roughly is that causing a physical effect involves changing the energy or momentum or some other conserved quantity in some physical entity. But nonphysical entities cannot possess or (therefore) transfer such conserved physical quantities. Therefore, nonphysical-to-mental causation would require the violation of some of our best confirmed scientific laws.

Papineau (2001) also advances a second, distinct, *physiological* argument. If there were nonphysical causes operating in violation of Causal Closure, we would expect this to occur in the human body – after all, it is here that nonphysical minds would intervene. But biology, the neurosciences and aligned fields find no evidence of such violations. This gives us broadly inductive reason to accept Causal Closure. See also Melnyk 2003: Ch. 6.

How one understands *the physical* seems relevant to how these arguments are to be taken. For instance, it is easy enough to see how a defence of Causal Closure based purely on the conservation laws might work with the Theory View of *the physical*, but a challenge arises if you try to combine the Theory View with the physiological argument, since it is not completely uncontroversial that physiological entities are nothing over and above those described by physics. (Papineau gets around this by endorsing a version of the Via Negativa View.) Or consider: just what is the evidence that the domain of

tables and chairs, rocks and mountains, and other entities similar to such objects is causally closed? The answer is at least not immediately obvious.

3.4 Causal argument scepticism

The causal argument, taken together with some sort of empirical defence of Causal Closure, is again the most influential defence of physicalism today. But this defence also has its critics. Montero (2006) maintains that physical conservation laws are irrelevant to mental causation. Bishop (2006) contends the argument is question-begging, relying on a hidden premise tantamount to physicalism itself. Tiehen (2015) advances the distinct but related claim that while we have good reasons to accept Causal Closure, they depend on our prior reasons to accept physicalism itself and so cannot be used to support the causal argument. Ney (2016) argues there is a tension between endorsing the causal argument and holding, as Papineau (2013) and many other philosophers do, that there is no causation in fundamental physics.

And so the debate goes on. To end on an optimistic note, causation has been the topic of a great deal of highly sophisticated philosophical and scientific work in the last few years. As philosophers come to understand causation better and better, perhaps they will be able to get clearer and clearer on the extent to which causal considerations either do or do not support the case for physicalism.

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