

CHAPTER 9

WHAT IS THE PHYSICAL?

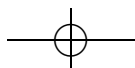
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PHYSICALISM, Hilary Putnam once said, is the only metaphysical position with any real clout (1987). Its clout comes from its alignment with physics; but, as we will see, physics is also a cause of its troubles. Physicalists generally claim that everything, or at least some significant subset of everything, is physical.¹ Most significantly, physicalists hold that minds and mental properties—physicalism’s •primary nemeses—are entirely physical. But what is it to be physical? With a few exceptions, physicalists have had little to say about this. Yet formulating a workable notion of the physical is of utmost importance—for what good is clout, if you don’t have substance?

• Q1

Addressing the question of what is the physical is important not only for understanding the general thesis of physicalism, but also for assessing the strength and significance of a number of the central arguments regarding physicalism and the physical nature of the mind. For example, debates over the possibility of zombies pervade the literature on consciousness. Zombies, in the relevant sense, are supposed to be creatures that are just like us in every physical respect yet lack consciousness. Are such creatures possible? Some have argued that while it is not conceivable, or logically possible, that there could be, say, H₂O that is not water, it is conceivable that there could be worlds that are physical duplicates of ours yet populated by zombies rather than conscious human beings, and thus consciousness does not logically

¹ Thoughts about the proper scope of physicalism vary; some take it to apply to everything whatsoever, others restrict it to the empirical world, others to the causal world, or the contingent and/or causal, and still others to the concrete realm.



supervene on the physical. But how are we to determine whether such zombies are possible? Without some prior notion of the physical, intuitions here are prone to run amok.

How one understands the notion of the physical also plays an important role in determining what one thinks about what poor, dear Mary—the imprisoned, brilliant neuroscientist—knows about the experience of seeing red. Would Mary, who knows all the physical facts about colour vision yet has spent her entire life in a black and white environment, be surprised upon seeing her first ripe tomato or would she just say, ‘Ho-hum, I knew that’s what red would look like all along’? To answer this question we need some understanding of what it is that Mary knows, which minimally involves at least some notion of what counts as a physical fact. Are the physical facts the facts that science tells us about? Are they the facts about the ultimate constituents of nature, whatever they may be? Different answers to the question of what it means to be physical will ground different intuitions about what Mary knows, and even about the coherence of the entire thought-experiment.²

Another illustration of the importance of understanding what it means to be physical is found in the literature on the causal argument for physicalism. This argument starts from the thought that sometimes we move our bodies in part because of something going on in our minds: say, we reach for a glass of water because we experience the sensation of thirst, see water in front of us, desire to drink it, and so forth. Assuming the world is not set up so that there is systematic causal overdetermination (that is, assuming that bodily effects do not usually have two distinct sufficient causes) and assuming that the physical world is causally closed (that is, assuming that every physical effect has an entirely physical causal history) this argument concludes (with some qualifications) that the mental is physical.³ But what is it that is supposed to be causally closed? What we need is a notion of the physical that allows for the physical world being causally closed and for physicalism being inconsistent with dualism. But in the literature one often finds notions of the physical that fails to satisfy both criteria. To give just one example, one might argue for physical causal closure by pointing out that all inorganic processes have causal histories that remain in the inorganic. Perhaps they do, but the physicalist cannot be claiming merely that the mental is ultimately constituted by inorganic phenomena, at least not when the inorganic is understood as that which is not carbon based, since the dualist can be perfectly content with the immaterial soul being non-carbon based.

Finally, it is often claimed, as Wayne Davis puts it, that ‘the principle argument for physicalism is the success of physics’ (1995: 679). Or, in J. J. C. Smart’s words: ‘[S]cience is increasingly giving us a viewpoint whereby organisms are able to be seen as physico-chemical mechanisms . . . yet, that everything should be explicable in terms of physics . . . except the occurrence of sensations seems to me to be frankly

² Dennett, for example, denies the coherence of the thought-experiment, since he denies that we can form any coherent thoughts about what follows from knowledge of all the relevant physical facts. See, for example, Dennett (1991: 398–401).

³ See Montero (2003) for further discussion of the causal closure of the physical.

unbelievable' (1959: 142).⁴ The reasoning here assumes that the physical world is the world given to us by physics (or physics and chemistry)—else why would its success be reason to think that the mental will fall under the physicalist umbrella? However, as we will see, there are serious problems with such a view.

Although we need at least *some* conception of the physical to fully engage with these issues, fortunately we need not provide necessary and sufficient conditions for being physical before entering the debate. Understanding concepts and determining what falls under their scope can go hand in hand, and as such the process of determining whether the mind is physical is itself a step in clarifying our understanding of the physical.⁵ Nonetheless, to enter the debate we need *some* ground to stand on, since without any conception of the physical at all, debates over whether the mind is physical would be as illuminating as the discussions two five-year-olds might have about the nature of infinity (and much less entertaining).

Some think that we already have an entry point into the debate; namely, common sense. On their view, our grounds for using the term 'physical' in philosophical arguments are no more shaky than, say, our grounds for using the term 'modest' in questions about whether an individual is modest: although in neither case can we fully explain the concept, both are intuitive enough. The two cases, however, are not analogous. For one thing, the concept of being modest is a concept from ordinary-language. To be sure, there are ordinary-language usages of 'the physical' as well, but they tend not to line up with philosophers' needs. For example, one might say, 'taking care of an infant is physically, but not mentally, challenging'. Here the physical pertains to non-mental aspects of our bodily actions, but in a debate over whether the mind is physical this cannot be what is meant. In ordinary language 'physical' is sometimes contrasted with virtual or digital, as in 'I'd prefer a physical copy to an email', but no physicalist should think an email isn't also physical. For another thing, while we can point to examples of modest people and to examples of immodest people, it is often not clear what is supposed to serve as an example of something non-physical, or at least something that if it were to exist would count as non-physical. Yet to avoid turning the claim 'the mind is physical' into a trivial truth we need to have some idea of a contrasting class, something that, if it were to exist, would count as non-physical. The mental clearly cannot be taken as an example. But what can?

Sometimes—with perhaps just a hint of exasperation—physicalists tell us that when they exclude non-physical phenomena from their ontology they mean to exclude such things as ghosts and other spooky stuff. Smart, for example, states that physicalists reject the view that experiences 'are a sort of ghost stuff. (Or perhaps ripples in an underlying ghost stuff.)' (1959: 154). And, as Jeffrey Poland puts it, the

⁴ Although Smart represents this as a 'confession of faith', Melnyk (2003) develops an extended argument for physicalism taking the success of the physical sciences as his starting point.

⁵ Moreover, when one's purpose is to argue against the view that the mental is physical, one needs at most a necessary condition that one can show does not hold of the mind, and when one's purpose is to argue for the view that the mental is physical one needs at most a sufficient condition that one can show does hold of the mind.

physicalist's bottom line is: 'there are no ghosts!' (1994: 15). But what is it about ghosts that, if they were to exist, would make them non-physical? Is it that ghosts would pass through walls without disturbing them? Millions of neutrinos may be coursing through the wall in front of me right now, yet neutrinos presumably count as physical. Perhaps ghosts would have no mass or wouldn't take up any space. Yet photons have no mass, and point particles, if they were to exist, would not take up space, yet neither, it seems, should count as counter-examples to physicalism. It even seems unreasonable to exclude from the physical realm things that do not exist in space-time. Physicists have speculatively posited something from which space-time itself emerges, the playfully called 'zerobrane.' Yet since there seems no reason to take zerobranes as nonphysical, we cannot take existing in space-time as a criterion from being physical.⁶ Richard Healey sums up the situation well when he says, '[the] expanding catalogue of elementary particle states of an increasingly recondite nature seems to have made it increasingly hard for the physicists to run across evidence that would cast doubt on a thesis of contemporary physicalism stated in terms of it' (1979: 208). Or, as Bertrand Russell said years before, 'matter has become as ghostly as anything in a spiritualist's séance' (1927/1992: 78).⁷ The moral is clear: ghosts, ghost stuff and other pretheoretically bizarre phenomena are not going to provide viable contrasts to the physical.

It might be claimed that we can have a useful notion of the physical even without specifying a contrasting class. Certain philosophers have argued that we can merely start with certain prototypical examples of physical objects and properties and extrapolate from there. But after specifying central cases of the physical, determining how to go on from there is no trivial matter. Let us take our prototypical examples of the physical from everyday so-called physical objects such as rocks and trees. In a sense, the mind, be it physical or not, would fit much more smoothly in with rocks and trees than with the fundamental particles of physics. For example, the notion of the mental fits easily into ordinary language. We also take the mental to fit into the same macro-level causal network as everyday objects: in explaining why Sam moves his hand (as opposed to the micro-particles in his hand) toward the glass of water, we naturally refer to his sensation of thirst, desire for water, and so forth. And these things would be true even if the mental were non-physical. But, presumably, since in formulating our concept of the physical we are supposed to extrapolate from rocks, trees, and hands so as to cover the phenomena of physics but not non-physical minds, something more needs to be said.

A more sophisticated version of this idea is the view that 'physical' is a natural kind term. That is, we start with our central examples of physical things and properties and then take our basic physical phenomena to be that which constitutes or realizes such things and properties, whatever it may be. As William Lycan states it, physicalism

⁶ Moreover, it would seem that that which was 'before' the big bang would not be spatio-temporal, yet could be physical.

⁷ For further discussion of this view and its historical precedents see Strawson (2003). See also Unger (1999).

is the view that ‘creatures with minds are made entirely of the same ultimate components as are ordinary inanimate objects, and their properties are determined by the ways in which those components are arranged and related to external things’ (2003: 15; see also Snowdon 1989). As Lycan sees it, this way of putting the physicalist thesis is ‘good enough to work with and . . . distinguish[es] that thesis from the views of Descartes and Hume’ (2003: 15).

• O2 Descartes certainly did reject the view that ‘creatures with minds are made entirely of the same ultimate components as are ordinary inanimate objects’. And Hume seems to at least reject the view that we can *know* that ‘that minds and ordinary objects are made of the same ultimate components since he holds that, in his words, ‘matter . . . and spirit are at bottom equally unknown and we cannot determine what qualities inhere in the one or in the other’ (1783/1998: 324).⁸ But although physicalists should reject these views this isn’t all they should reject. Among other positions, they should reject panpsychism; roughly, the view that the fundamental nature of reality involves mentality. Yet panpsychism can be formulated so that it is consistent with Lycan’s proposed criterion. Because Lycan’s criterion is too weak to exclude panpsychism, it is unclear whether such a criterion is, in fact, ‘good enough to work with’.⁹

Lycan’s criterion is too weak, since it does not exclude panpsychism, but in another sense it is too strong. Physicalists are monists inasmuch as they think that all matter is fundamentally composed of the same kind of stuff; namely, physical stuff. However, it seems that there can be more than one kind of fundamental physical stuff. Gassendi suggested this when he objected to Descartes’s dualism, stating that while he would grant Descartes his conclusion that mind and body are really distinct, he did not accept that this implies that the mind is incorporeal (Haldane and Ross 1968: 237). Moreover, if, as some physicists posit, dark matter is made entirely out of axions, a new kind of fundamental particle, dark matter, it would seem, should still count as physical. To be sure, the thesis that human beings contain within them fundamental stuff that does not occur in such things as rocks and chairs is, as Lycan puts it, rather ‘loony’ (2003: 14). But I think that even Lycan would agree that if such stuff were discovered to exist, it could count as physical. Thus, Gassendi is correct: merely stating that the mental is not made of the same ultimate components as ordinary inanimate objects does not suffice to make it non-physical. But what then does?

In respect to the mind, we want to know what is it that the mental supervenes on, is realized by, or is identical to (fill in your favourite dependence relation) in order for it to count as physical. To be sure, strictly speaking not all physicalists say that the mind, or even the brain for that matter, is physical. This is because not all physicalists apply the term ‘physical’ to higher-level phenomena. While this can cause

⁸ Note that Lycan also thinks that the situation with Hume is problematic.

⁹ Although most take panpsychism to be inconsistent with physicalism, not all do. See, for example, Strawson (2006) and Dowell (2006).

some confusion, the issue here is primarily terminological, since physicalists typically do not take the existence of rocks and trees to be counter-examples to physicalism (since rocks and trees, they will claim, depend on lower-level physical phenomena) even if they choose to reserve the term 'physical' for lower-level phenomena. A significant issue, however, is how to identify these lower-level phenomena; that is, how to identify that upon which, according to the physicalist, everything else depends. Identifying such dependence bases is, as Jeffrey Poland puts it, 'one of the deepest foundational issues facing physicalists' (1994).

Most physicalists want to specify the dependence bases in terms of whatever the physicist says exists. Wave-particle duality, one-dimensional strings, and other ghostly phenomena do not count as counter-examples to physicalism because, it is said, the physical is whatever is given to us by physics itself. In avoiding counter-examples in this way, however, we run into what is called 'Hempel's dilemma' (see Hempel 1980).¹⁰ On the one hand, it seems that we cannot define the physical in terms of current physics, since current physics is most likely not correct. Despite some physicists' heady optimism that the end of physics is just around the corner, history cautions prudence. The end of physics has been predicted before: toward the end of the nineteenth century, just before the relativity revolution, Lord Kelvin remarked that all that is left for physics is the filling in of the next decimal place; then, in the early part of the twentieth century Max Born supposedly claimed that physics would be over in six months. And, in all likelihood, today's claims that we've (just about) got it right are similarly unrealistic: today's physics is probably neither entirely true, in the sense that some of our theories may look as wrong-headed to future generations as phlogiston theory looks to us now, nor complete, in the sense that there are still unaccounted for phenomena.¹¹ Yet, on the other hand, Hempel claims that if we take physics to be some future unspecified theory, the claim that the mind is physical is extremely vague, since we currently do not know what that theory is. Geoffrey Hellman sums up this dilemma nicely: '[E]ither physicalist principles are based on current physics, in which case there is every reason to think they are false; or else they are not, in which case it is, at best, difficult to interpret them, since they are based on a "physics" that does not exist' (1985: 610).

A few philosophers take on the first horn and define the physical over current physics. Apart from making physicalism most likely false, this approach has some other rather odd consequences. For example, it seems to imply that neither Hobbes nor Le Mettrie count as physicalists and, moreover, that if a new particle is discovered next week, it will not be physical. Of course, it does provide us with a theory the truth of which is determinable now. But this can be said as well of the theory that the earth is flat. Hellman's response is basically to reject physicalism as a possibly true theory about the ultimate nature of the world yet allow that physicalism as defined

¹⁰ Melnyk (1997) dubs the problem Hempel formulates 'Hempel's dilemma'.

¹¹ Going further, one might say that inasmuch as physics strives for absolute precision, all current physics falls short of accuracy. Or, even worse, one might say that since current physics is probably inconsistent, it is complete for the unsatisfactory reason that from a contradiction one can prove anything.

over current physics may be of practical use, as false theories sometimes are. He thinks, for instance, that it may serve as a criterion of adequacy for the completion of physics (Hellman 1985: 610). And perhaps it can, but such a physicalism is far from what most physicalists take themselves to be defending, which is a theory that tells us something substantial about the ultimate nature of the mind.

Andrew Melnyk argues for something bolder: physicalism defined over current physics, he argues, is almost certainly false yet nonetheless acceptable as a substantial theory about the ultimate nature of reality (1997). It is acceptable, he argues, because the attitude a physicalist should have towards the thesis of physicalism is the attitude someone with realist and anti-relativist intuitions has towards her favoured scientific hypotheses. This attitude, he claims, amounts to taking one's favoured theory to be better than current and historical rivals; that is, those formulated theories that are sensibly intended to achieve a significant number of the favoured theory's goals. As such, it does not require that one take one's hypothesis to be true, nor, even, more likely true than false. Rather, just as, say, a string theorist asserts that everything is made out of strings while being aware that string theory is probably far from the last word and in fact more likely to be false than true, a physicalist asserts that everything is physical—in the sense of either being accounted for directly by the phenomena of current physics or realized by such phenomena—while being aware that physicalism is probably far from the last word and in fact more likely to be false than true. According to Melnyk, then, we can take on the first horn of Hempel's dilemma—that is, we can define the physical in terms of current physics—because (1) one can reasonably accept a scientific hypothesis while at the same time accepting that it is more likely to be false than true as long as the theory is better than its relevant rivals; (2) physicalism, as Melnyk understands it, what we can call 'M-physicalism', while more likely to be false than true is better than its relevant rivals; and (3) M-physicalism is a scientific hypothesis. Thus, defining the physical over current physics is supposed to give us an acceptable substantial theory.

One question to ask here is whether M-physicalism is better than its relevant rivals. And answering this is no easy task.¹² But let us put this issue to the side, since it is not even clear that taking physicalism to be better than its relevant rivals gives the physicalist what she needs. It seems that in philosophy when no options are good yet one is better than the other, it very well may not be reasonable to accept the best of this bad lot, and, in my opinion, philosophical honesty should prevent us from doing so. Consider the case of free will. You might think that one response to the free-will debate is better than all others because it is, perhaps, clearer, or perhaps it

¹² For example, is current physics better than what we can call 'physics-plus'; that is, better than current physics plus one additional kind of quark? If, as it seems, it is likely that new kinds of quarks will be discovered, and, as it also seems, that physics-plus counts as a relevant rival, then M-physicalism is not better than its relevant rivals. See Crook and Gillett (2001) for objections along these lines. Melnyk responds that physics-plus and variations thereof can count as similar enough to current physics not to be problematic for his view. As such, Melnyk, as I see it, comes closer to proposing a compromise view, which I discuss later, than to accepting the first horn of Hempel's dilemma—though it is a compromise in which physics still plays a role.

alone is not self-contradictory, yet since you think that all responses are failures, you do not accept any of them. But Melnyk has a different take, since, as he sees it, 'surely physicalism should be viewed as a scientific hypothesis' (1997: 226).

Is physicalism, or rather M-physicalism, a scientific hypothesis? It is empirical in nature, but it is not clear that being empirical suffices to make a theory scientific rather than philosophical.¹³ However, rather than tackling yet another demarcation problem, let us assume that M-physicalism is a scientific theory. What follows from this? It seems that whether or not M-physicalism is a scientific theory, it fails to capture the debate between physicalists and dualists. Perhaps the best current explanation of the ultimate constituents of everything does come from physics.¹⁴ Yet this is something dualists can accept. We might not have an alternative theory of how to account for the mental, claims the dualist, but we do know that a physicalist account will not work. Because dualists can accept M-physicalism, inasmuch as accepting it only amounts to accepting that it is currently the best explanation of the mental, M-physicalism would not seem to be up to the task of providing a formulation of the physical that is of use in the philosophical debate. It is, of course, an interesting question whether current physics provides the best explanation of the fundamental nature of everything, but this would seem to be a distinct question from that of the truth of physicalism, since physicalism—if we can make sense of it at all—should at least be a theory that dualists reject.

Smart proposes a different way to take on the first horn of the dilemma (1978). While Smart defines the physical over current physics, he does not think that this probably makes physicalism false. Rather, he argues that for the purposes of the mind-body problem current physics is good enough, since the principles relevant to understanding the mind are principles of 'ordinary matter' (for example, principles relevant to understanding neurons, such as molecular theory) and that these principles will most likely not be overthrown. Or, as Lycan puts it: 'the changes in the physics underlying biology and chemistry should not matter in any way to the mind, however much they matter to matter' (2003: 15). In other words, physicalism, understood in this way, says that once you've duplicated the phenomena at the neural level, you've duplicated the mental, regardless of what is going on at lower levels.

But it seems that the Smart/Lycan approach to taking on the first horn of Hempel's dilemma runs into problems as well, since if the neural itself is not physical, as would be the case if panpsychism were true, then although it may be that once we've duplicated the neural we've duplicated the mental, the mental would still not be physical. Moreover, although it may be very unlikely that our understanding of the mental will not be furthered by new developments in fundamental physics, it would seem to be within the realm of possibility that, say, the particular visual sensation of seeing red requires a certain type of process to be occurring at the level of fundamental physics. And it also seems possible that neural properties do not require this particular fundamental process (brains, as it were, are multiply realizable with respect to it).

¹³ See Wimsatt's discussion of this issue (2000).

¹⁴ Melnyk's 'everything' is meant to include everything causal and/or contingent.

Such a view, it would seem, could count as physicalistic even though it would not be true that the principles relevant for understanding the mind are the principles relevant for understanding ordinary matter, and even though duplication of the neural does not suffice for duplication of the mental.¹⁵

It seems, then, that taking on the first horn of Hempel's dilemma, that is, defining the physical-dependence base in terms of current physics, does not succeed. But does taking on the second horn fare any better? Many physicalists think it does. For example, David Armstrong explicitly tells us that when he says 'physical properties' he is not talking about the properties specified by current physics, but rather 'whatever set of properties the physicist in the end will appeal to' (1991: 186).¹⁶ In a similar vein, Frank Jackson holds that the physical facts encompass 'everything in a completed physics, chemistry, and neurophysiology, and all there is to know about the causal and relational facts consequent upon all this' (1986: 29). And, even if it is not always explicitly stated, it seems that, as Barry Loewer puts it, 'what many have on their minds when they speak of fundamental physical properties is that they are the properties expressed by simple predicates of the true comprehensive fundamental physical theory' (1996: 103).¹⁷ So for Armstrong, and others as well, it is not today's physics upon which we are to base our notion of the physical, and not any future physics, since, presumably, physics of the future will still be false for a long time to come, but, rather, a true and complete physics, a physics, as it were, *sub specie aeternitatis*.

Can we formulate physicalism in terms of a true and complete physics? For some, one problem with defining the physical in terms of future physics is that since we do not currently know what future physics will be like, we cannot now determine whether physicalism is true. And, indeed, this seems to be Melnyk's main reason to reject attempts to define the physical over future physics. But many physicalists do not think that our current inability to determine the truth of physicalism is problematic. Physicalism, as they see it, can be based on a physics that does not yet exist because it is a hypothesis that awaits scientific confirmation (or, for that matter, refutation). Physicalists are betting that it is correct, but do not claim to be able to now determine that it is correct.¹⁸

Physicalists, I agree, need not now determine whether physicalism is true. Unfortunately, a more serious problem is that, far from turning physicalism into a thesis whose truth awaits empirical support, using the notion of 'physics in the end' or 'a completed physics' to explain the physical actually seems to trivially exclude the

¹⁵ Externalist views of content pose a further problem to this explanation of physicalism.

¹⁶ Of course, not all properties the physicist appeals to are relevant: when a physicist is explaining a proposed budget in a grant application or explaining to her supervisor why she was late for work, she may be appealing to very different properties than when she is applying her mathematical skills in computing a wave function. But perhaps this distinction is intuitive enough. See Poland (1994) for discussion of this point.

¹⁷ Terry Horgan also explains physicalism in these terms; as he sees it, physicalism is the view that 'humans are, or are fully constituted by, entities of the kind posited in (an ideally completed) physics' (1994: 472).

¹⁸ For a clear explanation of this stance see McLaughlin (2001).

possibility that the mind is not physical, making physicalism with respect to the mind trivially true. For what is a true and complete physics, save for one that accounts for the fundamental nature of everything? If mentality is a real feature of the world, a completed physics will, by definition, account for the most fundamental nature of the mental as well.¹⁹ Yet neither physicalists nor their foes think that at this time in the debate the mind is physical simply as a matter of definition. Physicalists think the claim needs to be *argued for* and, as many hold, will ultimately depend on what scientific investigation reveals. And their foes clearly do not think that they are denying what amounts to, more or less, an analytic truth. It seems, then, that when physicalists who take on the second horn of Hempel's dilemma talk about a true and complete physics, they cannot simply mean a theory of everything, since this would make their claim that the mind is physical trivially true. Yet there is also reason to think that they do not simply intend to refer to the temporal end of physics. For this physics might still be inaccurate and incomplete; even worse, for all we know physics might regress. So it seems that physicalists need another option.

Some argue that there are phenomena that physics, and perhaps scientific investigation entirely, does not aim to cover. Rather, physicists, they argue, in their role as physicists, are only concerned to account for a certain class of phenomena, and because of this we can distinguish a true and complete fundamental physics from the true and complete fundamental theory of the world; that is, the fundamental theory of the world *sub specie aeternitatis*. The true and complete theory, it is claimed, would account for the fundamental nature of everything, whereas a true and complete physics would account for the fundamental nature of only those things that physics aims to cover.

But what sorts of phenomena are to be excluded from the scope of a true and complete physics? According to Brian McLaughlin, physicalists must take a stand on this. For example, the true and complete physics, McLaughlin thinks, 'would not, for instance, postulate a spiritual realm that is causally isolated from the realm governed by its laws' (2001: 11424). On McLaughlin's view, if a causally isolated spiritual realm were to exist, the true and complete theory of the world would account for it, yet a true and complete physics would not. And if there are things that exist outside the scope of a true and complete physics, physicalism is not trivially true; rather, in such a situation it would be false, since physicalists, according to McLaughlin, hold that a true and complete physics will be a true and complete theory.

Is it reasonable to think that physics has identifiable limits? According to Quine, 'if the physicist suspected there was any event that did not consist in a redistribution of the elementary states allowed for by his physical theory he would seek a way of supplementing his theory' (1981: 98). And, as Bas van Fraassen sees it, 'there are no science stoppers' (1996: 80). Quine and van Fraassen suggest what I take to be a good methodological principle: scientific enquiry should not accept a priori barriers, or, in other words, when you discover territory that does not conform to your map,

¹⁹ Of course, if a definition is justified, truth by definition is not necessarily a fault.

change the map, not the territory. Such changes might involve not only expanding our scientific ontology, but changing our scientific method as well. For example, if standard controlled experiments fail to reveal phenomena that we nonetheless suspect might exist—as some have claimed could be the case with parapsychological phenomena—we should try to find a way to change the control. If we are somehow convinced that there is a spiritual realm that is causally isolated from our world, let us try to understand it.

Rather than placing a priori constraints on the scope of scientific enquiry, however, physicalists may make predictions about the limits of scientific enquiry, and can take physicalism to be refuted if such limits are surpassed. This is the point McLaughlin is trying to establish. However, I am not sure that the example he provides of a causally isolated spiritual realm serves this purpose. To be sure, it seems reasonable to claim that physics will never cover that which we will never fathom, that which we will never have any reason to think exists. And it may be that a causally isolated spiritual realm fall into this category. This has nothing to do with spirits, whatever they may be, as it seems that any causally isolated realm would fall into this category as well. So it is a good bet that any causally isolated realm is outside the scope of physics. But do we really want to count, say, a causally isolated collapsed star as non-physical merely because physics could never touch it? I think that the answer is ‘no’. Moreover, even if we were willing to do this, physicalism, as defined over a true and complete physics, would still be necessarily true of our own causally connected world, which makes the theory trivial enough for most tastes.

The prospects for formulating a useful notion of the physical are beginning to look rather grim. But before we lose hope, let us look at some suggestions for demarcating the physical from the non-physical that come from the other side. While it is not unusual for physicalists to think of the physical so as to favour the truth of physicalism, dualists and other anti-physicalists, perhaps unsurprisingly, tend to do just the opposite. For example, some anti-physicalists define the physical over physics yet take physics to tell us only about the purely structural features of the world. If one, then, thinks that the mental has some sort of non-structural, nature and also that there is a sharp divide between the non-structural and the structural, it is easy to be led to the view that the mental is not physical (1996: 153, 163, and *passim*).²⁰ Other anti-physicalists think of the physical as the objective, as that which is knowable from a third-person point of view (see Swinburne 1994, Taliaferro 1994, and, while not a complete anti-physicalist, Nagel 1986). When experiential phenomena are taken, as they are by dualists, to be knowable only from the first-person point of view, it is also easy to see how one could be led to reject physicalism.

²⁰ Note that, confusingly enough, in the literature the structural/relational aspects of the world are sometimes taken to exhaust the physical aspects of the world, as in Chalmers (1996), while at other times the idea that physics tells us only of the structural/relational aspects of the world is taken to show that we cannot know the essence of the physical world (in the sense that the physical world has an intrinsic, non-relational aspect). See, for example, Russell (1927/1992) and Unger (1999). Additionally confusing is that the view that everything we know about the world is structural/relational is sometimes taken to support idealism. See, for example, Kant (1781–7/1929).

Just as we should reject definitions of the physical that make physicalism analytically true, we should reject definitions of the physical, such as the ones that seem to stand behind the dualistic views just considered, that make physicalism analytically false. Where does this leave us? According to some, problems with formulating a working notion of the physical dissolve the problem of physicalism and the mind–body problem entirely. As Chomsky sees it, because we have no way to formulate the physical/non-physical distinction, ‘we have no coherent way to formulate issues related to the “mind–body problem”’ (1995: 5; see also Chomsky 1993, 1998). Chris Daly claims that our lack of understanding of the notion of the physical shows that ‘no debate between physicalism and dualism can even be set up’ (1998: 213), while Tim Crane and Hugh Mellor, after finding flaws with a wide variety of proposals for defining physicalism, conclude that their paper ‘should really be the last paper on the subject of physicalism’ (1990: 83).

I think that although the problems we have found with many of the current attempts to demarcate the physical from the non-physical indicate that there is at least no obvious way to formulate a substantial question, it does not imply that there is no mind–body problem. Rather, there seems to be an interpretation of, or perhaps a replacement for, the physical that, while perhaps not worthy of the clout Putnam claimed was bestowed on physicalism by physics, does give the debate some substance.²¹ This replacement is hinted at by some of those who attempt to carve a path between the two horns of Hempel’s dilemma. These physicalists attempt to give content to the notion of the physical by taking the true and complete physics at issue to be a successor to today’s physics.²² On their view, physicalists are betting that future physics will have certain features in common with current physics; most importantly, that it will not incorporate fundamental mental phenomena. Physicalism thus becomes both a thesis about what this true and complete successor physics will account for (the fundamental nature of everything) and also a thesis about what this physics will be like (it will not contain, say, acts of fundamental consciousness). Physicalism as such, it is argued, is not trivial, since it could be false if the true and complete physics does not account for everything or if the true and complete physics is not a successor to current physics.

Despite appearances, the notion of the physical we have arrived at is actually not beholden to physics. In the final analysis, the reason it provides the thesis of physicalism with content is because it excludes the mental from the ultimate dependence base. And the question of whether this dependence base includes fundamental mentality is distinct from the question of whether it is exhausted by

²¹ I take it to be merely a terminological matter whether we should call the view a replacement for the notion of the physical or an interpretation of it.

²² For views along these lines see Papineau (1993), Poland (1994), and McLaughlin (2001). Alternatively, one can drop the ‘true and complete’ requirement and turn the question of physicalism into the question of whether a physics very much like ours but somewhat improved provides the fundamental dependence base for the mental, as do Lewis (1983) and Melnyk (2003). But this is uncomfortably close to the first horn of Hempel’s dilemma, because it seems that such a physics will not provide the fundamental dependence base for the mental, since it will, most likely, have neither a complete nor a correct account of the fundamental properties of nature.

the phenomena posited by current, future, or final physics. The question being posed by such compromise views, then, is not whether mental properties are determined by the properties posited by physics but, roughly, whether mental properties are determined by non-mental properties.²³

Whereas these compromise views arrive indirectly at a notion of the physical as, roughly, the fundamental non-mental and whatever is determined by such phenomena, a number of philosophers have suggested this understanding of the physical directly. For example, the idea that our central concern in the mind–body problem is whether mentality is fundamental is captured by Jerry Fodor’s claim that ‘if the semantic and intentional are real properties of things, it must be in virtue of their identity with (or maybe supervenience on?) properties that are themselves neither intentional nor semantic’ (1987: 97). Joseph Levine defends this take on the mind–body problem as well, formulating the thesis of physicalism as: ‘[O]nly non-mental properties are instantiated in a basic way; all mental properties are instantiated by being realized by the instantiation of other, non-mental properties’ (2001: 21). David Papineau suggests that we can think of the physical as ‘the “non-mentally identifiable” —that is, as standing for properties which can be identified independently of this specifically mental conceptual apparatus’ (2002: 41).²⁴ And in trying to formulate a physicalism that allows for the possibility of no fundamental properties, I have argued elsewhere that physicalism is true if all properties are eventually determined by non-mental properties such that all further determinations of these properties, if any, are non-mental, and that physicalism is false if there are some properties that are eventually determined by mental properties such that all further determinations of these properties, if any, are mental Montero (2006).

I think that taking the fundamental physical as the non-mental provides a useful starting place for understanding the central debates in philosophy of mind that I mentioned at the start of this paper. Zombies can be understood as creatures that are just like us in every non-mental respect. Mary, we should say, knows all the relevant facts about the non-mental aspects of colour vision. And the causal closure of the physical should be understood as the causal closure of the non-mental. This understanding of the physical also gives us a starting point in formulating an interesting thesis of physicalism in general. And the reason for this, at least as I see it, is that a central point of contention between physicalists and anti-physicalists is whether human beings, and perhaps also other animals, have, in some way, a special place in the world. One way we would seem to be special is if mental phenomena were part of the original brew that was set in motion, as one creation story goes, in the big bang. This would seem to give us a place of prominence, since it would hint at a world created with us in mind; that is, it would suggest, as another creation story goes, that when God created the world, she also created minds. Another way we would seem to be special is if mental phenomena were added as something extra somewhere

²³ I discuss this view further in Montero (2001).

²⁴ One problem, however, with this formulation is that, as Davidson pointed out, even if there were non-physical events, we might be able to identify, or refer to, them in non-mental terms (1970).

along the way. Thus, it seems that physicalism should rule out fundamental mental phenomena.

But we have not arrived at the final word, since taking the non-mental as our dependence base may not exclude all that physicalists would like to exclude. For example, a world in which numbers form the basic fabric of reality might not be a world in which the mental forms the basic fabric of reality, yet some might see such a world as antithetical to physicalism. And the same could be said of fundamental norms: a world where certain actions are immoral and that's that might make many physicalists uncomfortable. These examples illustrate a problem not just for formulating physicalism in general but even for formulating physicalism with respect to the mental; for excluding the mental from the dependence base is consistent with, say, mental phenomena being ultimately determined only by normative phenomena.²⁶ However, it is not too difficult to see how one can reformulate the theory so as to exclude numbers, norms, or whatever else one is interested in excluding: rather than the mental/non-mental contrast, we could employ the numerical/non-numerical, the normative/non-normative contrast, or a combinations of these instead.

Yet, one might be tempted to ask, what is it about the fundamental mental, the fundamental numerical, the fundamental normative that makes them all antithetical to physicalism? If we could answer this question we would be able to arrive at a unified notion of the physical that could make sense of questions about whether anything at all, including irreducible numbers, norms, and minds, is physical. I think there is no answer to this question save for the rather disappointing one that they tend to make some self-called physicalists uncomfortable. But we shouldn't take this disappointment too much to heart, since as long as we specify what is to be excluded from the dependence base, we can make sense of questions about the ontological status of norms, numbers, minds, and so forth (or at least I have not shown that we can't). As such, physicalism as a unified general thesis dissolves, while the mind–body problem awaits a solution.

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²⁶ Brandom (1994) argues that the mental is grounded in the normative (which, as he sees it, is ultimately grounded in the social).

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Queries in Chapter 9

- Q1. Author pls. verify this two words correct or not.
- Q2. Author Please verify repeated the word