

CHAPTER FOUR: CHOOSING NOT TO WORRY ABOUT CLOSURE

In Chapter Three, I argued that the causal exclusion argument fails. In light of the possibility of systematic overdetermination, as shown by Eugene Mills, and the possibility of simultaneous mental causation, as shown by E.J. Lowe, it is clear that the argument fails to demonstrate the necessity of reduction for mental causation. At the same time, I suggested that neither Mills nor Lowe has provided the substance dualist with a palatable theory, for neither theory is compatible with the possibility of libertarian agency. In what follows, I hope to show that the lengths to which Mills and Lowe have gone in order to preserve the truth of *closure* are unnecessary, and that the dualist who wishes to respond to the exclusion argument ought rather to focus her attention on *closure* than on *exclusion*.

In §1, I examine the implications of a rejection of *closure* on the causal exclusion argument. There I will show that, without *closure*, the argument simply goes away. Nevertheless, the rejection of *closure* is an unpopular position (to say the least). For this reason, I devote §2 to the question of evidence *in favor* of causal closure. In §3, I will

raise what I take to be the most significant challenge to any statement of the causal closure of the physical: Hempel's Dilemma. Accordingly, §4 and §5 will treat physicalist responses to the dilemma, the first and second horn of the dilemma respectively. Finally, in §6, I will argue that there is *no* causal closure statement that can adequately ground a causal exclusion argument against interactionist dualism. For that reason, the dualist ought *not to worry* about closure. Depending upon how one defines "physical," the resulting causal closure principle will either be (a) false, (b) compatible with interaction, or (c) obviously question-begging.

§1. *Closure & The Causal Exclusion Argument*

Suppose, as I have argued, that interactionist substance dualism cannot plausibly accommodate both libertarian freedom and *closure*, and that the dualist ought rather to affirm the former than the latter.¹⁵⁷ What follows if the dualist chooses to reject *closure*? Well, for one thing, the causal exclusion argument loses its argumentative force. Consider, once again, the argument:

- (1) Suppose mental event M causes physical event P at t . (*for reductio*)
- (2) P has a sufficient physical cause at t as well, call it P^* . (*closure*)
- (3) M is not identical with P^* . (substance dualism)
- (4) P cannot have more than one sufficient cause at t —unless this is a case of genuine overdetermination. (*exclusion*)
- (5) This is not a case of genuine overdetermination.
- (6) Then either P^* or M is the cause of P, but not both. ((1)-(5))
- (7) P^* , not M, is the cause of P.

¹⁵⁷ I do not mean to say that all interactionist dualists must be committed to a libertarian conception of freedom, or to the claim that such freedom obtains in the actual world. However, given the choice between (a) affirming *closure* and denying the possibility of libertarian agency, and (b) denying *closure* and allowing for the possibility of libertarian freedom, I think the latter is the clear choice. I will, of course, defend this claim in the course of this chapter.

(8) If M causes P at t , then M does not cause P at t . \otimes

According to the proponent of the causal exclusion argument, nonphysical mental causation must either be (a) systematically overdetermined, or (b) not, in fact, nonphysical after all. Absent *closure*, however, the conclusion simply doesn't follow.

By rejecting *closure*, the dualist is free to reject premise (2) of the argument. Without the assumption of a rival physical cause of P, there is no danger of the mental cause being "excluded" at all. In fact, the rejection of *closure* comprises a rather neat, straightforward response to the causal exclusion argument. The dualist need not defend the possibility of simultaneous causation, nor of efficacious yet systematically overdetermined mental causes, nor need she appeal to *fact* causation in order to understand the reality of mental causation. She can simply posit the existence of irreducibly mental causes of physical events and leave it at that. Without *closure*, the causal exclusion argument never gets off the ground. (This is, of course, why some have dubbed it the "causal closure argument.")¹⁵⁸

If, by rejecting *closure*, the dualist can avoid the difficulties of the causal exclusion argument *and* affirm the possibility of libertarian agency, then why don't all dualists reject it? What is the evidence in favor of *closure*? What, if anything, ought to prevent the dualist from rejecting this, admittedly widely-held, principle?

¹⁵⁸ See, for example, E.J. Lowe's "Causal Closure Principles and Emergentism" *Philosophy*, 75, 571-585 (2000).

§2.1 On Scientific Respectability

To the question, “Why don’t all dualists reject causal closure?” there is one surprisingly simple answer: they don’t want to be accused of being anti-scientific, ignorant dogmatists. (There is, for reasons we will consider shortly, a commonly-held belief that the rejection of causal closure is the rejection of science (with a capital “S”), and that no self-respecting philosopher of mind ought to adopt such a position.¹⁵⁹) More charitably, some substance dualists may choose not to reject causal closure because they recognize a near-consensus and would prefer, if at all possible, to avoid having to go against this consensus. This need not be for cowardly reasons, nor for intellectually lazy ones, but rather for quite respectable ones: very many intelligent people have thought about the question of causal closure, and most of them have come to affirm its truth. Barring reasons to reject causal closure, the dualist might be well advised, *commended* even, for conceding to the majority opinion on this question.

What I hope to have shown, however, is that there *are* good reasons for rejecting *closure*. Indeed, there are *excellent* reasons, and the dualist who is on the fence, so to speak, ought now to jump *off* the fence. As I argued in Chapter Three, the interactionist dualist who accepts *closure* will likely *also* have to accept the impossibility of libertarian freedom. In contrast, the *rejection* of *closure* enables the dualist to respond to the causal exclusion argument, and to do so in an exceedingly straightforward manner. For these

¹⁵⁹ For one example, see David Papineau’s *Thinking About Consciousness*. Although he comes to see the difficulties with assuming completeness, or closure, he notes the following: “The one assumption I did expect to be uncontroversial was the completeness of physics. To my surprise, I discovered that a number of my philosophical colleagues didn’t agree...My first reaction to this suggestion was that it betrayed an insufficient understanding of modern physics.” (p.45, my emphasis) (Oxford: Oxford University Press, 2002)

reasons, unless the evidence in favor of causal closure is so strong as to outweigh both of these considerations, the interactionist dualist ought simply to reject *closure*.¹⁶⁰

§2.2 Evidence of Causal Closure: From Completeness to Closure

What, then, is the force behind this consensus? What is the *evidence* in favor of causal closure? According to many physicalists, the evidence for closure is the success—past, present, and future—of science. In Chapter Three, we discussed the close connection between the causal closure of the physical domain and the completeness of physics.¹⁶¹ We noted that the two seem to go hand in hand, such that a complete physics should indicate a causally closed physical domain, and a causally closed physical domain should evidence a complete physics. In light of this connection, many feel that a denial of causal closure is tantamount to a dismissal of physics as a complete, or completeable, enterprise.

Jaegwon Kim, for example, writes that, if causal closure were false, then “complete physics would be impossible, even as an idealized goal.” After all, if the physical domain is not causally closed, then the physical domain, alone, will not suffice for a complete causal history of all physical events. Instead, for some physical events, we will have to “go outside the physical realm and appeal to nonphysical causal agents and

¹⁶⁰ For reasons that will become clear, I don’t actually want to suggest that the dualist reject *closure* as *false*. Instead, the dualist ought to reject *closure* as inadequate support for a causal exclusion argument. It *might* be *false*, but—depending upon how one defines “physical”—it might very well be *true but nonthreatening*. I will discuss this distinction in §3.2 and, in greater detail, in §6.

¹⁶¹ See Chapter Three, §4.2.

laws governing their behavior!”¹⁶² Even if it is *possible*—as Kim would surely concede—that physics will one day turn out to be incompletable, it is another thing entirely to conclude incompleteness *now*. As such, claims the physicalist, we ought not to affirm a doctrine that commits us to the inevitable failure of physics, and the denial of causal closure does just that.

Similarly, as we saw in Chapter Three, Andrew Melnyk argues that the success of physics today can serve as *positive* evidence of causal closure.¹⁶³ In “Some Evidence for Physicalism,” he writes,

Although the claim that the physical is causally closed is not explicitly stated in physics textbooks, it may nonetheless be inferred from claims that *are* explicitly stated in physics textbooks. According to the textbooks, then, contemporary physics has succeeded in finding sufficient physical causes for physical effects of very many kinds; and it has found no physical effects at all for which it is necessary...to invoke non-physical causes. But current physics’ success to date in finding that *many* physical events have sufficient physical causes provides inductive evidence that *all* physical events, including *both* unexamined physical events *and* examined-but-as-of-yet-unexplained physical events, have sufficient physical causes.¹⁶⁴

According to Melnyk, the success of physics is so great as to ground a positive, inferential argument for causal closure. Not only should we hold out hope for the future of physics, but we should conclude—here and now—that causal closure is true, and physics completable.

The following two premises are central to Melnyk’s argument:

- (1) Current physics has succeeded in finding sufficient physical causes for physical effects of many kinds.

¹⁶² Jaegwon Kim, *Philosophy of Mind* (Boulder: Westview Press, 1996, p.147) Cited in Barbara Montero, “Varieties of Causal Closure” in Sven Walter & Heinz-Dieter Heckmann *Physicalism and Mental Causation* (Exeter: Imprint Academic, 2003) p.179

¹⁶³ Chapter Three, §4.2

¹⁶⁴ In (Walter & Heckmann, 2003) p160-161

- (2) Current physics has found no physical effects at all for which it is necessary to invoke nonphysical causes.

From these premises, we are to conclude causal closure, which Melnyk defines here as:

- (CC) All physical events, including both unexamined physical events and examined-but-as-of-yet-unexplained physical events, have sufficient physical causes.

From the fact that physics has found *many* sufficient causes, and *no discernible gaps*, we are to infer causal closure.

What should we make of this argument? There are, I think, a number of ways that a dualist might respond here. First, she might note the difficulties raised by quantum indeterminacy—difficulties that, in a concessionary footnote, Melnyk himself acknowledges.¹⁶⁵ Alternatively, she might question the *structure* of the argument, which seems to move from the claim “We haven’t found any nonphysical causes” to the conclusion “There *aren’t* any nonphysical causes.”¹⁶⁶ In what follows, however, I will not pursue either of these worries. Instead, I will focus on an assumption that underlies *both* Melnyk’s inductive argument and Kim’s claim that the completeness of physics depends

¹⁶⁵ Melnyk writes, “I should point out that the formulation of the closure principle in the text is not quite right, since it speaks of ‘sufficient’ physical causes of physical effects, whereas, given the indeterminism of quantum mechanics, no physical events have sufficient physical causes. To avoid this difficulty, we should instead express the closure principle as the claim that the chances of all physical events are determined by earlier physical events plus physical laws, including the irreducibly statistical laws of quantum mechanics. I ignore this refinement in the ensuing discussion.”(Melnyk 2003, p.160, fn7)

Melnyk himself is not troubled by this, and suggests that things can simply be rewritten in terms of “chance-fixing.” I will not address this worry here, but for an argument against the claim that chance-fixing works just as well as sufficient causation, see E.J. Lowe’s “Physical Causal Closure and the Invisibility of Mental Causation.” (in Sven Walter & Heinz-Dieter Heckmann, *Physicalism and Mental Causation* (Exeter: Imprint Academic, 2003) pp.137-154. (See especially pp.143-145.)

¹⁶⁶ For more on this worry, see Barbara Montero’s “Varieties of Causal Closure” in (Walter & Heckmann 2003), pp. 173-190. (See especially pp.184-185.)

upon the causal closure of the physical domain. I hope to show that this assumption, though widespread, is unfounded.

§2.3 Closure and Completeness Revisited

In formulating his inductive argument for physicalism, Melnyk appeals—implicitly, but crucially—to the following conditional:

(CF) If physics is complete, then the physical world is causally closed.

To see why it is that Melnyk's argument rests upon (CF), note that, if (CF) were false, the success of physics could not serve as evidence of the closure of the physical world. According to Melnyk, the likely compleatability of physics—as evidenced by its explanatory and predictive success—is evidence of the closure of the physical world. Unless the former entailed the latter, it's hard to see why evidence of the former would serve as evidence of the latter.

Similarly, recall Jaegwon Kim's worry that, if causal closure were false, then “complete physics would be impossible, even as an idealized goal.” In making this claim, Kim affirms the contrapositive of (CF):

(CP) If the physical world is *not* causally closed, then physics is *not* complete.

In both cases, the message is clear: the completeness of physics and the causal closure of the physical domain rise and fall together; the one cannot be had without the other.

If this is true, then it must be the case that there is a tight connection between physics and the physical world, such that the latter can be defined in relation to the

former.¹⁶⁷ To see why, suppose that physics and the physical were *not* so related, and the definition of “physical” made no appeal to physics. On this supposition, an entity could be the proper study of physics without, thereby, being physical.¹⁶⁸ If the domain of physics included nonphysical entities, however, then physics might be complete only insofar as it made appeal to physical *and* nonphysical entities. There would, on this account, be *no* reason to believe that the completeness of physics entailed, or even *supported*, the causal closure of the physical domain—for completeness of this sort is wholly compatible with there being nonphysical singular causes of physical events. Indeed, if “physical” does not mean, roughly, “an object of physics,” then physics might be complete and the physical world might be really rather *far* from being causally closed.

The completeness of physics can only support the closure of the physical world if the entities in virtue of which physics is complete are the same entities that are said to constitute a causally closed domain. Absent this connection, completeness and closure come apart. The trouble, as we are about to see, is that this tight connection is difficult, if not impossible, to affirm.

¹⁶⁷ Barbara Montero offers a more detailed defense of this claim in (Montero 2003, pp178-179.)

¹⁶⁸ That is to say, it is theoretically possible that this be the case. Perhaps there is a definition of “physical” that makes no *explicit* reference to physics but which, nevertheless, ensures covariance between physical entities and the domain of Physics. I know of no such definition.

§3.1 Hempel’s Dilemma

Hempel’s Dilemma takes its name from Carl Hempel, who first posed the problem in his 1969 “Reduction: Ontological and Linguistic Facets.”¹⁶⁹ It is, primarily, a dilemma for those who would affirm the truth of physicalism—the claim, roughly, that everything that exists is physical. However, as we will see, it is not *only* a problem for the physicalist. Instead, anybody who affirms the causal closure of the physical world must take a position with respect to the challenge of Hempel’s Dilemma.

The problem, Hempel notes, is that physics is not presently a complete science. For that reason, the physicalist who defines “physical” in terms of physics will have to make clear *which* physics she means to refer to: present-day physics, or some future or idealized physics. Should she choose to define “physical” in terms of current physics, and do define “physicalism” accordingly, she will be left with a theory that is very likely false. After all, if “physical” means “an object of present-day physics,” then physicalism amounts to the claim that everything that exists is an object of present-day physics. If this is true, then the discovery of new physical entities is impossible; anything that the physicists may find tomorrow, or in ten years time, *cannot be counted as physical*. Surely the physicalist does not mean to affirm that the physicists have *already discovered* all that there is. Yet, should the physicalist choose the first horn of this dilemma and define “physicalism” in terms of present-day physics, that is precisely what her view would amount to. On the first horn of Hempel’s Dilemma, then, the truth of physicalism is extraordinarily unlikely.

¹⁶⁹ Hempel, C. (1969): ‘Reduction: Ontological and Linguistic Facets’, in Patrick Suppes, Sidney Morgenbesser and Morgan White (eds.), *Philosophy, Science, and Method: Essays In Honor of Ernest Nagel* (pp. 179–199), St. Martin’s.

The second horn of the dilemma is best understood as two related worries, both stemming from a single concern. Broadly understood, the problem with defining physicalism in terms of *future* physics is that we don't know what future physics will look like. Andrew Melnyk describes the problem as follows:

A physicalism whose content was not determinable by us would presumably be impossible for us to support empirically, and might, for all we know, not even exclude from existence the sort of paradigmatically nonphysical items—for example, souls, entelechies, ghosts—which physicalists have traditionally refused to countenance.¹⁷⁰

There are, as I said, *two* worries here: what we will call the “no content worry” and the “inappropriate extension worry.”¹⁷¹ The “no content worry” is just what it sounds like: if physicalism is defined in terms of a future-based physics, then it's not clear that we will be able to determine the content of the resulting ontology. Until we know what future physics will posit, we cannot know what it means to say that reality is exhausted by the objects of this future physics.

This is especially important for those who, like Melnyk, wish to use the success of *present-day* physics to support the truth of physicalism. For all we know, future physics will look quite different than the science that presently bears the name. For that reason, any inference from the success of *today's* physics to the exhaustive nature of some *future* physics will lack justification. The physicalist who defines physicalism in terms of a future (or idealized) physics runs the risk of losing whatever empirical foundation present-day physics might have provided.¹⁷²

¹⁷⁰ Andrew Melnyk, “How to Keep the ‘Physical’ in ‘Physicalism’” *The Journal of Philosophy*, Vol. 94, No. 12 (Dec., 1997), pp. 622-637; p. 622

¹⁷¹ Jessica Wilson, “On Characterizing the Physical.” *Philosophical Studies* (2006) 131:61–99) p.68

¹⁷² It is, I hope, clear that the charge raised against a future-based physicalism applies with at least equal force to a physicalism based on an *idealized* physics. If we lack knowledge about what physics will say in 25 years, we *certainly* lack knowledge about what it would say were to it reach its ideal end.

The second worry is this: because we don't know what the physicists will eventually find, it's very difficult to say what they will *not* find. That is, it is difficult—if not impossible—to rule out the eventual discovery of things that would, intuitively, make physicalism false. (This is why Jessica Wilson has dubbed this the “inappropriate extension” worry—for such a physicalism might include in its ontology things that seem not to belong in a physicalist ontology.) What is to prevent the physicists from discovering *sui generis* mental forces, for example, or psychic or protopsychic mental laws, like the ones Chalmers envisions? This concern, the “inappropriate extension worry,” constitutes the second problem that arises when one defines “physical” in terms of future physics. Even if the first worry could be met, and a future-based account of “physicalism” could be said to have an adequate degree of content, it might nevertheless fail to be the right *sort* of content. It's hard to see how a “physicalism” that allows for Cartesian souls, for example, would be a physicalism at all.

We have, then, the two horns of Hempel's Dilemma. Should the physicalist take the first horn, and define her ontology in terms of present-day physics, then the resulting physicalism will be very likely false. Should she instead take the second-horn, and define physicalism in terms of some future, or idealized, physics, then the resulting construal of physicalism will run the twofold risk of (a) lacking content completely, and of (b) allowing for the possibility of “physical” ghosts.

§3.2 The Dilemma Applied

In the introduction to this chapter, I claimed that the dualist ought *not to worry* about accepting causal closure. We are now in a position to see what I meant by that, and why it's so significant. Any claim as to the causal closure of the physical world must, of course, invoke the term "physical." In light of Hempel's Dilemma, we may—and, indeed, should—ask: *what is it* that constitutes a causally closed domain? Is it the domain constituted by the objects of *present* day physics, or of some *future*, or idealized physics? The truth of causal closure cannot accurately be assessed until we have disambiguated these two interpretations of the principle. For that reason, a closure principle that has *not* been so disambiguated is not something that *anyone*—dualist or otherwise—ought to grant, for it's not at all clear, in doing so, what is being granted! Ultimately, as I will argue in §6, *neither* will suffice for a (convincing) causal exclusion argument against dualism. If the first is affirmed, then causal closure is false; if the second is affirmed, it is compatible with fundamentally mental causation. In both cases, the result is not something that a dualist—even an interactionist substance dualist—will need to worry about.

To see why this is the case, note that both horns of Hempel's Dilemma apply directly to the question of closure. Should the advocate of closure grasp the first horn, and define "physical" in terms of present-day physics, then she will be left with a causal closure principle that is (almost) certainly false. Consider, once again, the closure statements proposed by Kim and Melnyk, respectively:

Closure: If a physical event has a [sufficient] cause that occurs at t , it has a physical [sufficient] cause that occurs at t .¹⁷³

(CC) All physical events, including both unexamined physical events and examined-but-as-of-yet-unexplained physical events, have sufficient physical causes.

A moments reflection will tell us why, on the first horn of Hempel’s Dilemma, *neither* principle is likely to be true: it is extraordinarily unlikely that all of the causally relevant features of the world have already been discovered by the physicists. The physicists do not claim that physics is complete, and I see no reason at all why we should think that it is. Yet, if “physical” means (roughly) “an object of present day physics,” then a *presently complete* physics is precisely what *closure* and *CC* entail. Likewise, if present day physics is *not* complete, if instead there are at least some physical events the causes of which the physicists have *not* yet discovered, then both *closure* and *CC* (so construed) are false.

What about the second horn? There are, as we have seen, two aspects of the second horn of Hempel’s Dilemma: the *no content worry* and the *inappropriate extension worry*. For now, I will mostly bracket the first of these concerns. I do this for two reasons: First, I have been persuaded that the *no content worry* is not much of a worry after all. As we shall see, there are ways of defining a future-based physics without sacrificing content. Second, if I am wrong about this and a future-based account of the physical is an empty account, then a future-based causal closure principle will be empty as well. One needs no argument to see why an empty concept is a nonthreatening one.

¹⁷³ Jaegwon Kim *Physicalism or Something Near Enough*. (Princeton: Princeton University Press, 2005) p.43.

The trouble with a future-based causal closure principle, then, is the problem of inappropriate extension. Once more, our closure principles:

Closure: If a physical event has a [sufficient] cause that occurs at t , it has a physical [sufficient] cause that occurs at t .¹⁷⁴

(CC) All physical events, including both unexamined physical events and examined-but-as-of-yet-unexplained physical events, have sufficient physical causes.

Now suppose that fundamental mentality exists, and is causally active in the world—and *not* merely with respect to other fundamentally mental entities. If this is true, then an idealized physics—a physics that is *complete*—must take these entities into account. A future-based physics, therefore, *may very well* take these into account. All of this may seem to presuppose the existence of fundamental mentality, but notice that the mere *possibility* of fundamental mentality suffices for the *possibility* of such entities being accounted for by physics in the future.

If it is possible that fundamental mentality exists, then—on the second horn of the dilemma—it is possible that there are fundamentally mental *physical* entities.¹⁷⁵ In §6.3, we will consider in greater detail what it would mean for dualism if the mental were incorporated into the physical in this way. For now, it will suffice to note that such an incorporation (a) is wholly compatible with both *closure* and *CC*, understood in terms of the second horn, and (b) undermines the argumentative force of the causal exclusion

¹⁷⁴ (Kim 2005, p.43)

¹⁷⁵ If this sounds like an oxymoron, we ought to note that it is not. The definition of “physical” that we are presently considering does not preclude the possibility of fundamental mentality, and “mental” need not mean “nonphysical.”

argument.¹⁷⁶ We will return to both of these points throughout the remainder of this chapter, as we consider various physicalist responses to Hempel's Dilemma.

To summarize, Hempel's Dilemma reaches beyond the physicalist's need to define *physicalism*, and applies with equal force to the challenge of defining causal closure. The physicalist who adopts the first horn of the dilemma must address the charge that the resulting physicalism, and closure principle, are very likely false. The physicalist who adopts the second horn must likewise contend with the charge that her physicalism and closure principle, *even if true*, are compatible with something that looks an awful lot like interactionist substance dualism.¹⁷⁷

§4.1 The First Horn: Andrew Melnyk's Physicalism

In "How to Keep the Physical in Physicalism," Andrew Melnyk presents what is, as far as I know, the only attempt at grasping the first horn of Hempel's Dilemma.¹⁷⁸ Melnyk grants that defining physicalism in terms of present-day physics has the unfortunate result of rendering physicalism (very probably) false. Nevertheless, he advocates doing just that. Where Melnyk's argument gets interesting is in his *defense* of this position. After all, shouldn't a physicalist who believes that physicalism is very likely

¹⁷⁶ Briefly, the compatibility of a future-based closure principle with causally active, fundamentally mental entities undermines the causal exclusion argument by falsifying premise (3)—the claim that the mental cause is not identical with the physical cause that closure demands. We will discuss this in greater detail towards the end of this chapter.

¹⁷⁷ Note that it is *not*, strictly speaking, compatible with substance dualism itself—for dualism requires a duality of substance, and our present proposal would involve a *unified* substance that happens to include fundamental mentality.

¹⁷⁸ *The Journal of Philosophy*, Vol. 94, No. 12 (Dec., 1997), pp. 622-637

false find another position? Melnyk says that he should not, and that, on the contrary, the physicalist need not be at all troubled by the likely falsehood of physicalism.

Melnyk summarizes the argument against taking the first horn, roughly, as follows: current physics is very probably incomplete, and so a current-physics based physicalism is very probably false. If *this* is what is meant by physicalism, then we ought not to be physicalists, for physicalists are committed to the (at least likely) *truth* of physicalism. In response, he writes the following:

My reply to this argument is to challenge its final step, that is, the inference that a physicalist should abandon physicalism just because physicalism is very likely false. The argument assumes that a physicalist is someone who must assign a high, or even very high, probability to the thesis of physicalism...But I deny this assumption, claiming that a physicalist need *not* assign a high probability to physicalism, and can therefore comfortably live with the result that physicalism has a very low probability.¹⁷⁹

Now, on a first reading, this sounds kind of crazy. After all, what *is* a physicalist if not a person who believes physicalism to be true?

In defense of the claim that a physicalist need not be committed to the truth of physicalism, Melnyk offers what I will call the *SR Argument*. Central to the SR argument are the following definitions:¹⁸⁰

(SR) To take the SR attitude toward a hypothesis is (1) to regard the hypothesis as true or false in virtue of the way the mind-independent world is, and (2) to assign the hypothesis a higher probability than that of its *relevant rivals*.

(RR) Hypothesis H1 is a relevant rival to H2 if and only if (a) H1 is sensibly intended to achieve a significant number of H2's theoretical goals; (b) the hypotheses, H1 and H2, fail to supervene on one another; and (c) H1 has actually been formulated.

¹⁷⁹(Melnyk 1997, p. 624)

¹⁸⁰ (Melnyk 1997, p. 625-626)

According to Melnyk, the SR attitude is “the attitude that those who have broadly scientific realist and antirelativist intuitions take toward what they regard as the best of current scientific hypotheses.” (626) An advocate of, say, string theory may not necessarily believe that the theory is *true*, at least not in its entirety. Instead, she might simply believe that string theory is *better than the available alternatives*. The fact that she is not firmly convinced of the *truth* of string theory is not, says Melnyk, reason enough to deny that she is a string theorist.

In the same way, argues Melnyk, a physicalist need only adopt the SR attitude towards physicalism in order to affirm physicalism. As long as she believes that physicalism is:

- (a) true or false in virtue of the way the mind-independent world is, and
- (b) more likely to be true than any other *genuinely distinct, actually formulated ontology*

she may call herself a physicalist. Furthermore, not only is it possible to adopt the SR attitude towards a theory without affirming the *truth* of that theory, one need not even believe that said theory is *at all likely* to be true. After all, if none of the available theories are likely to be true, then the *most* likely need not be very likely at all. Melnyk concludes, “Therefore, to be a physicalist does not require regarding physicalism as likely to be true (let alone very likely to be true).”¹⁸¹

To summarize, then, Melnyk suggests that the physicalist define “physical” with reference to current physics. Accordingly, the only things that count as physical are those things—entities, forces, laws—with which the physicists are already acquainted. Furthermore, Melnyk offers the following definition of physicalism:

¹⁸¹ (Melnyk 1997, p.625)

Physicalism is roughly the thesis (1) that every entity is either itself a physical entity or is exhaustively composed, ultimately, of physical entities, and (2) that every property is either itself a physical property or is realized, ultimately, by physical properties.¹⁸²

Given the very likely discovery of new entities, Melnyk's physicalism is highly unlikely to turn-out to be true. Still, claims Melnyk, the likely falsehood of physicalism need not dissuade the physicalist from affirming it. Instead, as long as she is able to adopt the SR attitude towards physicalism, she ought not to worry about the (probably inevitable) ultimate falsification of her theory of choice.

§4.2 The First Horn: Relevant Rivals

What should we make of this argument? As I see it, there are two questions that we ought to ask in response to the SR argument: (1) Is it enough that the physicalist adopt the SR attitude towards physicalism? (2) Is the SR attitude something that a physicalist can justifiably adopt towards a theory that is, admittedly, probably false? In answer to the first question, I am inclined to think that, yes, a person who is able to adopt the SR attitude towards physicalism can reasonably be called a physicalist. The second question is a bit more complicated. There, I claim that a physicalist *cannot* justifiably adopt the SR attitude towards Melnyk's Physicalism—not because it is probably false, but rather because of the *reasons* for which it is probably false. To see why, it will be helpful to look more carefully at what Melnyk means by a “relevant rival.”

Suppose I were to offer the following rival hypothesis to physicalism:

¹⁸² (Melnyk 1997, p. 622)

Antiphysicalism: (1) not every entity is either itself a physical entity or exhaustively composed, ultimately, of physical entities and, (2) not every property is either itself a physical property or realized, ultimately, by, physical properties.

If antiphysicalism qualifies as a rival hypothesis to physicalism, then no physicalist can rationally adopt the SR attitude towards physicalism. The falsity of physicalism entails the truth of antiphysicalism; accordingly, even if the probability of physicalism being true were as high as .49, antiphysicalism would remain the more probable hypothesis. Furthermore, given the definition of physicalism in terms of present day physics, no physicalist believes the probability of physicalism to be anywhere near as high as .49. If antiphysicalism is a viable alternative, then, it follows that no physicalist can adopt the SR attitude towards physicalism.

Melnyk anticipates this line of reasoning. In fact, it is for this reason that he includes a detailed account of what does, and does not, qualify as a rival hypothesis. Specifically, he writes:

One especially important consequence of (RR) is that the sheer negation of a hypothesis, unsupplemented by any other claims, does *not* count as a relevant rival to the hypothesis, since the unsupplemented negation of a hypothesis...cannot sensibly be intended to achieve the theoretical goals of the hypothesis.¹⁸³

Instead, in order for the negation of a hypothesis to count as its rival, it must be supplemented with some additional claims—claims that offer an alternative approach to the theoretical goals of the original hypothesis. For example, Melnyk notes that while “atheism unadorned” does not qualify as a rival of theism, atheism conjoined with “the findings of contemporary science” *does*.¹⁸⁴ Presumably, this is because the simple denial of the existence of God cannot explain the phenomena that theists attribute to God. The

¹⁸³ (Melnyk 1997, p.627)

¹⁸⁴ (Melnyk 1997, p.627)

additional components, the findings of science, *can* go some distance towards accounting for those phenomena, and so the conjunction of the two meets criterion (a) of RR. Antiphysicalism alone will not, therefore, qualify as a relevant rival to physicalism.

What *will* count? Consider again Melnyk's definition of a relevant rival:

(RR) Hypothesis H1 is a relevant rival to H2 if and only if (a) H1 is sensibly intended to achieve a significant number of H2's theoretical goals; (b) the hypotheses, H1 and H2, fail to supervene on one another; and (c) H1 has actually been formulated. (626)

It is in virtue of the first criterion, (a), that antiphysicalism fails to qualify as a relevant rival to physicalism. The latter two criteria serve primarily to ensure that the relevant rival is, in fact, a *rival*: (b) tells us that the rival hypotheses are logically distinct from one another, and (c) prevents us from appealing to some future, presently unarticulated theory. In contrast, the first criterion is crucial to determining the *relevance* of a potential “relevant rival.”

What, then, are the “theoretical goals” of Melnyk's physicalism? In order better to understand what a relevant rival of his own theory would be, Melnyk suggests that we understand “physicalism” as the conjunction of the following two theses:

- (1) There is some science, S , distinct from the totality of all the sciences, such that every entity (property) is either itself mentioned as such in the laws and theories of S or is ultimately constituted (realized) by entities (properties) mentioned as such in the laws and theories of S .
- (2) S is current physics. (633)

So understood, the theoretical goals of physicalism are to assert (1) the existence of one fundamental, ontologically exhaustive science and (2) that current physics *is* that science. More broadly understood, the theoretical goal of Melnyk's physicalism is to explain the relationship between current physics and the world.

In light of these goals, Melnyk notes that the potential relevant rivals to (his) physicalism will fall into the following two categories: those that affirm (1) but deny (2), and those that deny (1). In what follows, I will not consider relevant rivals of the second kind.¹⁸⁵ Instead, I will devote the remainder of this chapter to rivals of the first kind—those that affirm the existence of a fundamental, ontologically exhaustive science, but deny that current physics is that science. My reasons for this are simple: I believe that there are relevant rivals of this variety that a committed physicalist really ought to deem more likely to be true than Melnyk’s physicalism. If I am correct, then the SR attitude is not a justifiable attitude to adopt towards Melnyk’s physicalism.

Before considering these rival theories, however, I want to note what Melnyk says about hypotheses of this variety. He first considers the possibility of choosing some *other* physical science—specifically, he suggests biology—as the fundamental, ontologically exhaustive science posited in premise (1). Because physics is more fundamental than biology, and because biology *also* has a history of changing and developing, Melnyk notes that a relevant rival that replaced physics with biology would be *less* likely to be true than physicalism.

Of course, nobody *claims* that biology can play the role that physicalism ascribes to physics. Instead, the more common rival to physicalism, according to Melnyk, is dualism. He writes:

The best-known relevant rival [that affirms (1)] is traditional dualism, which I interpret as the view that, to put it very crudely, physicalism is true of everything except the mind: there is a basic science, but it is the *conjunction* of physics and folk psychology...

¹⁸⁵ For Melnyk’s discussion on why these rivals will not be more probably than his physicalism, see (Melnyk, 1997, p. 634-635.)

If Melnyk is correct, then dualism—which he takes to be a supplemented physicalism of sorts—is the most common alternative attempt at achieving the theoretical goals of physicalism. Where physicalism posits a certain relationship between physics and the world, dualism posits a *similar* relationship, but supplements the role of physics with that of folk-psychology. Dualism is, therefore, a relevant rival to physicalism.

Yet, so understood, dualism cannot be more likely to be true than physicalism is. After all, as Melnyk notes, to whatever extent the inevitable progress of physics makes physicalism likely to be false, it will, to that same extent, make dualism likely to be false.¹⁸⁶ If Melnyk’s physicalism makes up a large part of dualism, then dualism will be equally endangered by the progress of physics. For that reason, Melnyk tells us, physicalism is *more likely to be true* than dualism, its “best known relevant rival.”¹⁸⁷

§4.3 The First Horn: A More Relevant Rival

We are, at last, in a position to see where Melnyk’s argument goes wrong. We began with the question of how, in light of Hempel’s Dilemma, one ought to define the physical. Contrary to most physicalists, Melnyk suggests that we grasp the *first* horn of the dilemma and define physicalism with respect to current physics. Noting the likely falsehood of physicalism so construed, Melnyk argues that a physicalist need only affirm

¹⁸⁶ There is one way that this would not be true: If the physicists were to find things that validate the claims of folk-psychology with respect to the mind, then dualism would fare better than physicalism in the face of such findings. Still, as a general point, the fact remains: a dualism that includes most of the claims of physicalism is not likely to be more probable than physicalism is.

¹⁸⁷ Again, the claim is only that dualism is the best known relevant rival *of this variety*. Nevertheless, because Melnyk takes this approach to be the stronger of the two, the claim here is intended to be a fairly strong one.

the *greater likelihood* of physicalism with respect to its relevant rivals. He then attempts to show, albeit briefly, that the most likely candidates for a relevant rival to physicalism are less likely than physicalism is, and so a physicalist can justifiably affirm physicalism.

The trouble is, Melnyk's physicalist doesn't just have to worry about rivals to physicalism *in general*, she has to worry about rivals to physicalism *defined in terms of current physics*. In light of Hempel's Dilemma, isn't it clear that *other formulations of physicalism* are the most obvious candidates for a relevant rival for *this* construal of physicalism? After all, the whole point of Hempel's Dilemma was to show that there are a number of things that might be meant by "physicalism," and the truth—or *likelihood*—of the position cannot be assessed until these ambiguities have been sorted out. Having disambiguated things in one way, furthermore, does not exempt the physicalist from keeping the alternative possibilities in mind.

To put the problem in Melnyk's terms, recall that he divided possible relevant rivals into two categories—those that affirm only the first of the following two theses, and those that deny even the first:

- (1) There is some science, S , distinct from the totality of all the sciences, such that every entity (property) is either itself mentioned as such in the laws and theories of S or is ultimately constituted (realized) by entities (properties) mentioned as such in the laws and theories of S .
- (2) S is current physics. (633)

Suppose, then, that I accept (1) but reject (2). I might do this for one of two reasons: I might believe that S is some science wholly unrelated to physics, or I might believe that S is physics, but *not current physics*. Indeed, the (many) physicalists who advocate a future-based definition of the physical are, it seems, doing just this.¹⁸⁸ Such physicalists

¹⁸⁸ See, for example, J. Poland *Physicalism: the Philosophical Foundations*, (Oxford: Clarendon Press, 1994), (Wilson 2006) and (Dowell 2006)

affirm the existence of a fundamental, ontologically exhaustive science, and they reject the claim that *current* physics is that science—but they offer in its place a future, or idealized, version of physics. Surely the accounts of this variety are the *most relevant* rivals to Melnyk’s physicalism.¹⁸⁹

More importantly, a physicalism defined in terms of future, or idealized, physics will *of course* be more likely to be true than one based upon current physics. After all, it is the likely *progress* of physics, not the likely future failings, that render a present-based physicalism so very improbable. If, as Melnyk surely believes, the physicists are likely to discover new entities or laws in the future, then a physicalist must concede that future-based physics is *closer* to being ontologically exhaustive than current physics is. That is, she must conclude that a physicalist account that takes the second horn is *more likely to be true* than Melnyk’s account. If this is correct, then a physicalist ought not to adopt the SR attitude towards Melnyk’s physicalism.

All of this, of course, assumes that a workable future-based physicalism is available. More specifically, these considerations assume that *at least* the “no content worry” can be met. A physicalism that lacks content is neither likely nor unlikely to be true; a meaningful assessment of the likelihood of a philosophical position requires a degree of content that is, at least, sufficient to determine what it would take for the position to be *false*.¹⁹⁰ In what follows, we will consider two alternative physicalist accounts, both of which proceed by grasping the second horn of Hempel’s Dilemma.

¹⁸⁹ Jessica Wilson makes the same point in (Wilson, 2006 p. 66-67.) (I came to this conclusion independently, and only later found that she had done so as well.)

¹⁹⁰ I suppose some empty claims are overwhelmingly likely to be true, but not in a meaningful way. Physicalism , for example, is true but tautological if understood as the claim that “everything that exists exists.”

Both, I maintain, can meet the demands of the *no content worry*, though only one of the two can also address the *inappropriate extension worry*.

Because there are ways of understanding the physical that do *not* commit the physicalist to the likely falsehood of physicalism, but instead stand to *benefit* from the future developments of physics, I conclude that Melnyk's physicalism ought not to be endorsed by any physicalist. Instead, absent some better approach to the first horn, a physicalist really ought to grasp the *second* horn of Hempel's Dilemma. A causal closure principle stated in terms of the second horn, however, will be inadequate for the role that it is thought to play in the causal exclusion argument. As I will show §6, a future-based understanding of physics entails a causal closure principle that is either *unacceptably stipulative*, or *compatible with interaction*.

§5.1 The Second Horn

The two aspects of the second horn of Hempel's Dilemma are, again, the *no content worry* and the *inappropriate extension worry*. In "The Physical: Empirical, Not Metaphysical," J.L. Dowell gives the following colorful illustration of the two worries:

Who knows what future people we'll call 'physicists' will study? Given that we have no idea what will be a posit of that theory, we also have no idea what won't. And given that we have no idea what won't be a posit of the theory ultimately developed by physicists, we're unable to identify what would count as falsifying physicalism on the resulting formulation.

To sharpen the objection, suppose that future physicists, perhaps in a series of tragic lab accidents, will go off their collective rockers and take to channeling the dead. This possible scenario highlights just how unconstrained the notion of

‘whatever future people we’ll call ‘physicists’ will study’ really is.¹⁹¹

If, by “future-physics,” we mean “whatever enterprise future bearers of the term ‘physicists’ are engaged in,” then a future-physics based physicalism will fail to meet either of the two worries that constitute the second horn of Hempel’s Dilemma. On the one hand, an account of this variety would be, from our vantage, unfalsifiable. On the other—and here I admit to stretching Dowell’s illustration a bit—this “physicalism” could be true of a world in which the dead are *actually* channeled. A physicalism that is compatible with the possibility of (actual) séances is no physicalism at all.

How *should* a physicalist understand “future-physics?” In two very recent papers, Jessica Wilson and J.L. Dowell assert that there are *theoretical parameters* that establish the limits of what ought to count as “physics.”¹⁹² In fact, Wilson and Dowell are largely in agreement as to what these parameters are, and how the future-based physicalist ought to address the *no content worry*. Where they differ, and they do differ, is with respect to the *inappropriate extension worry*. I will treat the two worries in turn.

¹⁹¹ *Philosophical Studies* (2006) 131:25-60, p.37

¹⁹² (Dowell 2006); Jessica Wilson, “On Characterizing the Physical” *Philosophical Studies* (2006) 131:61–99

§5.2 Giving Content to “Future Physics”

According to J.L. Dowell, physics is best understood as an enterprise that meets the following two criteria:¹⁹³

- (a) it is a science, and
- (b) it treats the most fundamental, or—if there is no *most* fundamental—the *relatively* fundamental, entities.

Dowell suggests four “hallmarks” of a scientific theory. For something to be a science, it ought to have (1) empirically verifiable, explanatory hypotheses, (2) some empirical confirmation of these hypotheses, (3) a unified explanatory account of some empirical generalizations, and (4) additional empirical support—in particular, it should be a “good fit” with established empirical observations.¹⁹⁴ More simply stated, for something to be a science it ought to make *explanatory, empirically verifiable* claims about the world, and some of those claims ought to have empirical confirmation.

The second criterion distinguishes physics from, say, biology or chemistry. If there is a most-fundamental level of the actual world’s ontology, then an idealized physics will be a science that deals with objects at that level of fundamentality. If, on the

¹⁹³ On p.39, for example, Dowell defines a physical theory as “a scientific theory of the world’s relatively fundamental elements.” Similarly, Wilson defines physics as “a science treating of the relatively fundamental entities.” (p.72)

¹⁹⁴ (Dowell 2006, p.39.) Dowell does not claim originality with respect to these hallmarks, but is instead attempting to capture what is already in the philosophy of science literature. For example, she references: Boyd, R. (1983): On the Current Status of the Issue of Scientific Realism, *Erkenntnis* 17, 135 61-69.

Boyd, R. (1985): ‘Lex Orandi est Lex Credendi’, in P.M. Churchland and C.A. Hooker (eds.), *Images of Science*, Chicago: University of Chicago Press.

Hempel, C. (1965): ‘Aspects of Scientific Explanation’, in *Aspects of Scientific Explanation and Other Essays in the Philosophy of Science*, New York: the Free Press.

Hempel, C. (1966): *Philosophy of Science*, Edgewood Cliffs: Prentice-Hall.

other hand, there is *no* most fundamental level, then an idealized physics will be the science of the most fundamental level *relative to that to which we have empirical access*.

If this is what is meant by “physics,” then how should we understand physicalism? Dowell writes that “Intuitively, physicalism is the thesis that there’s nothing ‘over and above’ the physical.” For a slightly more extensive account, recall Melnyk’s definition:¹⁹⁵

Physicalism is roughly the thesis (1) that every entity is either itself a physical entity or is exhaustively composed, ultimately, of physical entities, and (2) that every property is either itself a physical property or is realized, ultimately, by physical properties. (622)

A future-based physicalism, then, amounts to the claim that there is nothing “over and above” the relatively fundamental entities; every entity (property) is either itself a relatively fundamental entity, or is exhaustively composed (realized) of relatively fundamental entities.

In this way, Dowell notes, the future-based physicalist can meet the *no content worry*—for, contrary to the objection, it is in fact *clear* what would count as a falsification of *this* physicalism. If there are entities that are *less* fundamental (i.e., more complex) than the (relatively) fundamental entities, and those entities are not in any way reducible to the fundamental ones, then Dowell’s physicalism is false. Likewise, if there are relatively complex properties, and those properties are not realized by any relatively

¹⁹⁵ Both Dowell and Wilson equate physicalism with the claim that there is nothing “over and above the physical.” (Wilson p.62, Dowell p.25.) Unlike Melnyk, they do not explicitly distinguish between the proper objects of physics and those things that are *composed* of the proper objects of physics. Because I think this is a valuable distinction, and because I think both Wilson and Dowell would also affirm Melnyk’s definition, I have chosen to use Melnyk’s definition here as well.

I do think one proviso is necessary: the word “realized,” in this context, should not be read as entailing all that Melnyk means by “realization physicalism.” Instead, I mean only to include the possibility of there being higher-level entities or properties that are—*somewhat*—composed out of the more fundamental ones.

fundamental properties, then Dowell's physicalism is false. Stated in terms of the science of physics, if it turns out that there are things that cannot be incorporated into physics so understood, then physics is not the ontologically exhaustive science that physicalism says it is, and physicalism is false.

Furthermore, Jessica Wilson—who defines physics, like Dowell, in terms of relative fundamentality—notes that *some* of the content of a future physics will be the content of *present* day physics. After all, current physics is a science that treats the most fundamental entities *relative to the limits of our knowledge*. Of course, current physics is overwhelmingly likely to be false.¹⁹⁶ For that reason, Wilson includes in her definition of a “physical entity” that it be “treated, *approximately accurately*, by current or future...versions of fundamental physics.” (72) (emphasis added) Assuming, then, that current physics gives an approximately accurate account of some entities, it follows that those entities form a part of a future-based physicalism as well.

It seems, then, that the *no content worry* can be met. The objects of current physics give us *some* idea of what future physics will look like, (unless, of course, current physics is a *complete* failure), and the possibility of there being irreducible entities of relatively high complexity provides a clear account of how the world would have to be for future-based physicalism to be false. Future-based physicalism, defined in terms of a science that treats the relatively fundamental entities of the world, is hardly an empty theory.

¹⁹⁶ Wilson actually maintains that present physics is *certainly* false, owing to the inconsistency of the conjunction of The Standard Model and General Relativity. (Wilson, 2006 pp.62-65)

§5.3 The First Horn Revisited

Before moving on to the *inappropriate extension worry*, I wish to note the following: If this is correct, and the no content worry can be met, then Melnyk's response to Hempel's Dilemma fails—*even if* the inappropriate extension worry cannot be met. Physicalism defined in terms of future physics clearly meets the criteria for a relevant rival to (Melnyk's) physicalism.

- (RR) Hypothesis H1 is a relevant rival to H2 if and only if (a) H1 is sensibly intended to achieve a significant number of H2's theoretical goals; (b) the hypotheses, H1 and H2, fail to supervene on one another; and (c) H1 has actually been formulated. (626)

If, as Melnyk supposes, substance dualism is intended to achieve a significant number of the theoretical goals of his physicalism, then physicalism based on future physics *surely* is. Like Melnyk, Dowell and Wilson propose accounts that are committed to the existence of a unified, fundamental, ontologically exhaustive science. Criterion (a), then, is met. Further, a physicalism based on future-physics does not supervene on Melnyk's physicalism, for the former might be true in cases where the latter is false—namely, on the assumption that physics progresses. Criteria (b) and, of course, (c) have, therefore, also been met. A physicalism based on future-physics is a relevant rival to Melnyk's physicalism. (Indeed, I would argue that it is the *most* relevant rival.)

In light of this conclusion, it's hard to see how a physicalist could adopt the SR attitude towards Melnyk's physicalism. After all, doing so would require her to assign a higher probability to current-physics based physicalism than to physicalism defined in terms of future-physics. That just can't be right. It simply cannot be the case that physics *today* is more likely to be the fundamental, ontologically exhaustive science than physics

in, say, 50 years is. When you include the possibility of *idealized, complete* physics, the matter really is decided. Unless the physicalist is ready to say that the physicists are done, that they have gone as far as they can go, she cannot say that a current-physics based physicalism is more probable than one based on future-physics.¹⁹⁷

§5.4 The Second Horn: Inappropriate Extension

While Wilson and Dowell agree with respect to the *no content* worry, their accounts diverge when it comes to the question of *inappropriate extension*. According to Dowell, it is not up to the philosophers to determine, *a priori*, what kinds of things the physicists are going to discover. Instead, she writes that “if no actual mental property is among the basic physical ones, as seems overwhelmingly likely, that’s a matter to be settled *a posteriori*.¹⁹⁸ Jessica Wilson, in contrast, argues that a physicalist “need not and should not hand over all authority to physics to determine what is physical.”¹⁹⁹ Instead, she argues that a “no-fundamental-mentality” constraint ought to be included in one’s definition of “physicalism.” In what follows, we will consider (albeit briefly) the strengths and weaknesses of these two responses.

We have already seen what Dowell’s physicalism amounts to. Her account requires that the entities and properties of the actual world be subsumable under the domain of future physics, where “physics” refers to the science of the relatively

¹⁹⁷ As I noted in fn. 34, Jessica Wilson makes the same point. (Wilson, 2006 p. 66-67.)

¹⁹⁸ (Dowell 2006, p.28)

¹⁹⁹ (Wilson 2006, p.69)

fundamental entities. If there is nothing over and above that which is relatively fundamental, then Dowell's physicalism is true. It is, therefore, easy to see how the *inappropriate extension* objection might be raised against Dowell, for if there are relatively fundamental *mental* entities—or relatively fundamental mental *properties*—then they will count as “physical” on this account. In this way, the *inappropriate extension worry* is a real worry for Dowell's physicalism. Physicalism is traditionally taken to exclude the possibility of irreducible mentality; Dowell's physicalism allows for it.²⁰⁰

Nevertheless, we should not conflate the claim that *some* “inappropriate” things might count as physical with the stronger claim that *anything at all* might qualify. After all, as Dowell notes, the theory that posits these entities must remain a *science* if it is to remain *physics*. If, therefore, the “physicists” of the future were to incorporate “miracle-performing angels” into their theoretical arsenal, they would cease to be physicists. Dowell writes,

A miracle-performing angel is an entity whose acts are by definition incapable in principle of being fit into a pattern of explanation characteristic of scientific theories. So if angels were to figure in our ideal physical theory...it would have to be in some mundane sense of ‘angel’. They would have to be angels stripped of their miraculous powers and governed by the same laws everything else is.²⁰¹

We will look more carefully at the final claim in this passage shortly. For now, it will suffice to note that there are limits to what kinds of things can be accepted as physical on

²⁰⁰ At this point, some might question whether or not this account is enough like traditional physicalism so as to count as physicalism. The scope of this chapter does not allow for a detailed treatment of this question, but I will say this: There is an awful lot that goes into being a physicalist account. If, as Dowell argues and as I will argue, the physicalist must break from the *a posteriori* commitments so central to physicalism in order to exclude the possibility of fundamental mentality, then it is at least an open question which approach is *more physicalistic*—the one that preserves a posteriority or the one that excludes mentality.

²⁰¹ (Dowell 2006, p.41)

Dowell's physicalism. Those limits exclude the kinds of things that resist the explanatory and predictive grasp of an empirical science, but they do *not* necessarily exclude mentality. To revisit the quotation invoked above, "if no actual mental property is among the basic physical ones...that's a matter to be settled *a posteriori*."²⁰²

For Jessica Wilson, this is not enough. Instead, Wilson maintains that it is the job of the *physicalist*, and not just the *physicist*, to determine what is meant by "physical." More specifically, Wilson supplements her future-physics based definition of the physical with a "no fundamental mentality" constraint. She writes, "An entity existing at a world *w* is physical if and only if:

- (i) it is treated, approximately accurately, by current or future (in the limit of inquiry, ideal) versions of fundamental physics at *w*, and
- (ii) it is not fundamentally mental (that is, does not individually either possess or bestow mentality)"²⁰³

(In order for something to qualify as "fundamental physics" at some world *w*, it must be—as we have noted—the *science of the relatively fundamental* at world *w*.) Like Dowell, Wilson includes in her definition of the physical an appeal to future-physics; unlike Dowell, her definition is not *exhausted* by this appeal. Instead, Wilson addresses the *inappropriate extension worry* in her definition of "physical." If something is fundamentally mental, then it is not physical on Wilson's physicalism. Even if it were to become the subject of the science of the relatively fundamental, it would *still* not be physical. In this way, Wilson attempts to ward-off the *inappropriate extension worry*.²⁰⁴

²⁰² (Dowell 2006, p.28) I have omitted the phrase "as seems overwhelmingly likely." I do this not to misconstrue Dowell's position, but rather for brevity sake. Because I included the full quotation above, I hope that the sentiment of Dowell's claim is, nevertheless, preserved.

²⁰³ (Wilson 2006, p.72)

²⁰⁴ For a powerful argument to the effect that Wilson's account does not *successfully* keep mentality out of the physical, see Neal Judisch's "Why 'non-mental' won't work: on Hempel's dilemma and the characterization of the 'physical'" (*Philosophical Studies* (2008) 140:299–318) Briefly stated, Judisch

Wilson and Dowell do not disagree about what it is for something to be *physics*; they disagree only as to what it is for something to be *physical*. This is a significant distinction, and it is one that we ought to keep in mind. Both Dowell and Wilson want to invoke physics in order to define “physical.” Both want specifically to include the findings of *future* physics in this definition. Where they differ, then, is in the extent to which they are willing to throw their lot in with the *actual* future of physics. Dowell’s account allows for the possibility that the future of physics will diverge from what she, as a physicalist, expects; she ties her physicalism, nevertheless, to the future of this empirical science. Wilson does not. While she grants that the *physics* of the future might include such undesirables as relatively fundamental mental entities, she draws the line at granting that *physicalism* might include this possibility. For this reason, while Wilson’s account addresses the inappropriate extension worry in a way that Dowell’s cannot, it does so at a cost. As we shall see, *exclusion by stipulation* is not a very powerful philosophical maneuver.

§6.1 Taking Stock of Closure

In light of the considerations raised by Hempel’s Dilemma, we have the following competing accounts of what it is for something to be physical (corresponding to Melnyk, Dowell, and Wilson respectively):

Physical_M: An entity or property is physical iff it is a posit of current physics.

notes that, while Wilson’s NFM rules-out *fundamental* mentality, it does not rule-out the possibility of *fundamental protomenality*, as might be posited by a protopsychic or a neutral monist.

Physical_D : An entity or property is physical iff it is, or will be, a posit of the future (idealized) science of the relatively fundamental.

Physical_W : An entity or property is physical iff it is, or will be a posit of the future (idealized) science of the relatively fundamental *and* it is not fundamentally mental.²⁰⁵

With these definitions in hand, we are finally in a position to address, in detail, the questions that were raised in §3.2—namely, the implications of Hempel’s Dilemma for causal closure and the exclusion argument. In what follows, I hope to show that *none* of the foregoing versions of physicalism can sustain a causal exclusion argument of any real force.

Consider, once again, the causal exclusion argument against substance dualism:

- (1) Suppose mental event M causes physical event P at t . (*for reductio*)
- (2) P has a sufficient physical cause at t as well, call it P^* . (*closure*)
- (3) M is not identical with P^* . (substance dualism)
- (4) P cannot have more than one sufficient cause at t —unless this is a case of genuine overdetermination. (*exclusion*)
- (5) This is not a case of genuine overdetermination.
- (6) Then either P^* or M is the cause of P, but not both. ((1)-(5))
- (7) P^* , not M, is the cause of P.
- (8) If M causes P at t , then M does not cause P at t . \otimes

I have maintained that the dualist ought to focus here attention on the causal closure of the physical world, rather than on *exclusion*. In what follows, I will again take Kim’s *closure* as a paradigmatic closure statement. That is, I will assume that what holds for *closure* holds for causal closure, broadly understood. There are, to be sure, alternative ways of stating the causal closure of the physical world.²⁰⁶ Nevertheless, because it is the

²⁰⁵ I have not included posits of current physics that are treated “approximately accurately” for the following reason: if they are treated approximately accurately by current physics, then they will, presumably, be treated by idealized physics as well.

²⁰⁶ David Papineau, for example, gives the following definition: “All physical effects are fully caused by purely *physical* prior histories.” He then adds, in a footnote, the following disclaimer: “A stricter version of [this principle] would say that the *chances* of physical effects are always fully fixed by their prior

definition of “*physical*” that is central to the problem under discussion, and because *all* causal closure statements must appeal to the physical, I hope it will be clear that the problems for *closure* are problems not for this particular statement of causal closure, but for the claim that the physical world—whatever that may be—is closed in such a way as to exclude irreducibly mental causes.

§6.2 The Causal Closure of the Physical_M

As we now know, we cannot assess the strength of the causal exclusion argument until we have disambiguated the word “physical.” Suppose, then, that we do so by appealing to Physical_M; that is, suppose that we embrace Melnyk’s response to Hempel’s Dilemma and define the physical in terms of current physics. What happens to premise (2)? Well, (2) is supported by *closure*:

Closure: If a physical event has a [sufficient] cause that occurs at *t*, it has a physical [sufficient] cause that occurs at *t*.

If *closure* is false, then premise (2) is unfounded. Of course, *closure* must *also* be disambiguated in light of Hempel’s Dilemma. By applying Melnyk’s Physical_M to *closure*, we get:

Closure_M: If an *event that is a posit of current physics* has a sufficient cause that occurs at *t*, it has a sufficient cause that occurs at *t* *that is a posit of current physics*.

physical histories...” *Thinking About Consciousness*. (Oxford: Oxford University Press) p17 Papineau’s statements differ both from Kim’s and from each other. Nevertheless, *both* of them, like *closure*, appeal to “physical” causes and, as such, will need to be disambiguated in light of Hempel’s Dilemma. Again, I don’t see how the relatively minor differences in competing closure statements will have any bearing on the difficulties raised by Hempel’s Dilemma, and for that reason I will not attempt to demonstrate the effects of the dilemma on a variety of principles.

We have already seen why closure_M is false. If it were true, then current physics would be complete. Current physics is *not* complete, so closure_M is false. It simply isn't the case that the physicists are *already familiar with* all of the causes of all known (caused) events. After all, note how little it takes for closure_M to be false: as long as there is one event that *has* a sufficient cause at some time, but lacks a *known* sufficient cause at that time, closure_M fails. Surely there are types of events that are (a) causally efficacious in the (known) physical world and (b) currently unknown to the physicists. If so, then closure_M is false.

Given Melnyk's concession that physicalism, on the first-horn, is likely false, might he argue that closure_M need not be true either? That is, can the physicalist simply affirm the SR attitude towards causal closure and leave it at that? I don't think so, for if, as I have argued, a physicalist ought not to adopt the SR attitude towards *physicalism* defined in terms of current physics, she ought *also* not to adopt it towards *causal closure* so defined. Not only is it the case that closure_M is false, it is also just obviously *less likely* than a causal closure principle defined in terms of future physics—or so it seems to me. I will not, however, argue this point any further.

Even if the arguments against Melnyk's physicalism fail, and even if the physicalist can justifiably adopt the SR attitude towards closure_M , this much should by now be clear: *the dualist should feel no compunction to follow suit*. If a causal closure principle is clearly false, then no dualist should affirm it. A causal closure principle defined in terms of current physics, then, cannot ground a causal exclusion argument. The crucial premise of the argument, that sustained by causal closure, has to be at least *likely* to be true in order to be of any argumentative use. If, by *closure*, the physicalist means

closure_M , or CC, then the dualist ought simply to reject premise (2) of the causal exclusion argument and leave it at that.

§6.3 The Causal Closure of the Physical_D

Suppose, instead, the physicalist grasps the second horn and adopts Dowell's physicalism, Physicalism_D. What follows for *closure* then? By substituting Physical_D for "physical," we get:

Closure_D: If an event that is a posit of the future (idealized) science of the relatively fundamental has a sufficient cause that occurs at t , it has a sufficient cause that occurs at t that is a posit of the future (idealized) science of the relatively fundamental.

Unlike closure_M , closure_D is not obviously false. For this principle to be false, it would have to be the case that some relatively fundamental event has a cause that is not, itself, relatively fundamental. (If it were relatively fundamental, then presumably an idealized physics would talk about it.) Furthermore, if physics is completable, then closure_D is true. In order for it to be the case that the science of the relatively fundamental is complete, it must be the case that the domain of the relatively fundamental is causally closed.²⁰⁷ An outright rejection of closure_D , then, would be a far stronger position for the dualist to adopt than a rejection of closure_M .

Fortunately, the dualist need not reject closure_D in order to address the exclusion argument. As we have seen, the truth of closure_D is compatible with the possibility of

²⁰⁷ I discuss the entailment between causal closure and completeness in Chapter 3, §4.2

fundamental mental causation. Instead, should the physicalist appeal to closure_D in order to ground the exclusion argument, the dualist ought rather to reject premise (3):

(3) M is not identical with P*.

To see why, remember that, on Dowell's physicalism, it is entirely possible for there to be an event that is *both mental and physical*. When closure_D requires that we posit a physical cause of P, it requires only that we posit a cause of P that is *relatively fundamental*.²⁰⁸ As long as the dualist is prepared to admit the fundamentality of the mental cause, she can—on this definition of the physical—grant its *physicality* as well. If she does, then the causal exclusion argument goes away. Absent premise (3), the distinctness of the mental and physical cause, the argument does not go through.

There are, I think, two potential objections that must be addressed at this point. First, if the dualist grants that the mental is physical, in what sense does she remain a *dualist*? Second, even if what we now call the mental can be incorporated by the physical, can any of the important *features* of mentality survive? What is to prevent the mental from going the way of the miracle-performing angels, “stripped of their miraculous powers and governed by the same laws everything else is?”²⁰⁹

To the first question, I'm not sure how important the mere *duality* of the dualist's ontology ought to be. If, as the substance dualist believes, fundamentally mental substances—and properties, and events—are *real*, then what is to prevent them from eventually becoming the subject of a science? And what better science than the science of the relatively fundamental? If the physicalist is willing to accept a definition of “physical”

²⁰⁸ Strictly speaking, P must also be *nonmiraculous*—or, compatible with scientific investigation. I discuss this shortly.

²⁰⁹ (Dowell 2006, p.41)

that is compatible with the possibility of fundamental mentality, then the failure of dualism to entail the falsity of physicalism is hardly the fault of the dualist.

In “Why ‘non-mental’ won’t work: on Hempel’s dilemma and the characterization of the ‘physical,’” Neal Judisch considers the possibility of mentality being incorporated by an idealized understanding of physics. He maintains that such a scenario would not, and ought not, trouble most dualists. On the contrary, he writes:

It is in sensitivity to just this concern that most philosophers who deny that physics can account for a particular feature of the mental append to that judgment a proviso: “absent a major revision in our conceptual repertoire” or some “revolutionary change” in scientific theorizing, or what have you—after all, it would take an unusual degree of clairvoyance to know *a priori* that something like this couldn’t take place, especially in the absence of any rough proposal about what the pertinent changes would have to be.²¹⁰

Judisch’s point is a simple one: we don’t know what the physicists will discover. For that reason, a dualist who is committed to the existence of mental entities that are quite unlike the entities postulated by *present day* physics might, nevertheless, concede the possibility of entities of this sort being discovered by some *future, ideal* physics. Dualists are dualists because the monism presented by current physics strikes them as inadequate. I find it hard to believe that dualism *per se*—the commitment to there being *two kinds of things*—is of particular importance to most dualists.

What *is* of particular importance to most dualists is the preservation of certain features of the mental: intentionality, subjectivity, the presence of qualitative consciousness, and—for some, at least—freedom. Before simply accepting the possible physicality of the mental, then, a dualist ought first to be sure that the *second* objection can be met. Granting that Dowell’s physicalism allows for the incorporation of mental

²¹⁰ (Judisch 2008, p312).

entities into the Physical_D, can these important *features* of mentality survive the incorporation? If not, then it is only nominally true that the mental is preserved.

I don't see why not. That is, I don't see anything in Dowell's account that would suffice to *prevent* these features from being preserved. To see why, consider again Dowell's response to the possibility of miracle-performing angels. She writes,

A miracle-performing angel is an entity whose acts are by definition incapable in principle of being fit into a pattern of explanation characteristic of scientific theories. So if angels were to figure in our ideal physical theory...it would have to be in some mundane sense of 'angel'. They would have to be angels stripped of their miraculous powers and governed by the same laws everything else is. (41)

If, by "miracle," Dowell means "a violation of the laws of ideal physics," then clearly physicalism cannot allow for miracle-performing angels. Entities that violate the actual laws of a science cannot be captured by that science; the activity of such things could neither be predicted nor explained given the theoretical resources alone. If genuine mentality is like *this*, then, Dowell's physicalism cannot allow for the existence of the mental, properly speaking.

That said, I don't see why the dualist need insist that mentality is wholly anomalous, capable of law-breaking activity. True, the laws of *current* physics certainly can't capture all that there is to the mental, but why think those are all the laws that there are? Indeed, why assume that they are even *true*? If Dowell is to tie her physicalism to the future of the science of the relatively fundamental, then she has to accept the possibility of all manner of surprises. Just as there might be fundamentally mental *substances*, *properties*, and *events*, there might also be *laws* that govern those entities—laws with which we are presently unfamiliar. Perhaps those laws will be deterministic, mechanistic, and otherwise incompatible with much of what we take the mental to be—but perhaps

not.²¹¹ They might, instead, be probabilistic laws, irreducibly intentional in nature and compatible with what we believe about the mental. That's the thing about the future, we don't know what will happen!

I think it would be helpful here to briefly consider a quotation from William Hasker's *The Emergent Self*. After detailing his own dualistic account, which includes the emergence of irreducibly mental substances from the physical world, Hasker considers the charge that these substance might just be physical after all. He responds as follows:

If philosophers are prepared to stretch the meaning of 'physical' to encompass everything that has been said here about the field of consciousness, then so be it. What is *not* acceptable, however, is for someone to take the claim, thus arrived at, that 'the mind is physical' and use it as a premise from which to infer characteristics of the conscious mind that are contrary to the ones postulated in this [account].²¹²

This is, I think, just exactly the right response. If the mental is real, and if it is fundamental, then any complete science that captures all that is fundamental will capture the mental—including whatever relevant laws there might be. By calling that science "physics," the physicist is *not* thereby entitled to infer that all that is fundamental is *just like the things we now call physical*.

Of course, all of this is highly speculative. Dowell would claim that all of this is highly *unlikely*; that, empirically speaking, there is just very little reason to believe that any of this will come about. That's alright, though. All that is needed here is possibility. Obviously, in order to justify her dualism, the *dualist* ought to believe it likely that fundamental mentality is real, and is quite unlike what we presently understand the physical to be. In order to respond to the *exclusion argument*, however, she need not

²¹¹ (As evidence of this possibility, we might look to quantum physics, which has *already* surprised the physicists with the introduction of indeterminacy where we previously took determinism to be the rule.)

²¹² William Hasker, *The Emergent Self*. (Ithaca and London: Cornell University Press, 1999), p.201

persuade the physicalist of the likelihood of the eventual discovery of fundamental mentality. For *this* purpose, the mere possibility suffices.

The causal closure principle under consideration, *closure_D*, is compatible with the possibility of a fundamentally mental cause being, at the same time, a physical cause. It is, therefore, *inadequate* as a premise in the causal exclusion argument, for it cannot support premise (3). Without premise (3)—without, that is, the claim that the mental cause is not identical to the physical cause required by *closure*—there is no exclusion to be had. *Closure_D*, like *closure_M*, fails as the crucial premise in the causal exclusion argument against substance dualism.

§6.4 The Causal Closure of the Physical_W

We are left, finally with Wilson's physicalism. Before attempting to formulate *closure_W*, I will simply state that, in contrast to the first two closure principles, *closure_W* is neither obviously false nor compatible with the possibility of *sui generis* mental causation. (It is, however, a bit unwieldy as principles go!) By applying Wilson's definition of "physical" to *closure*, we get the following:

Closure_W: If an *event that is a posit of the future (idealized) science of the relatively fundamental and is not fundamentally mental* has a sufficient cause that occurs at *t*, it has a sufficient cause that occurs at *t* *that is a posit of the future (idealized) science of the relatively fundamental and is not fundamentally mental*.

If *closure_W* is true, then interactionist substance dualism is false. This closure principle explicitly precludes the possibility of fundamental mentality exerting causal influence in

the physical world. For that reason, it is certainly *strong* enough to serve as a premise in the causal exclusion argument.

However, for precisely that reason, it is altogether too strong to be of much use. If *closure_w* is true, then interactionist substance dualism is false. *Clearly*, then, a substance dualist ought to reject it. After all, what is the justification for Wilson's closure principle? On what grounds are we to accept exclusion of the mental from the domain of the relatively fundamental? On *no* grounds, apart from the fact that fundamental mentality *just doesn't fit* with what physicalism has, historically, claimed exists. The extension of "physical" so as to include fundamental mentality would be *inappropriate*; the result would not, according to Wilson, be physicalism properly speaking. But notice that this is not a problem for the dualist. On the contrary, the dualist is *committed* to the claim that physicalism, understood so as to exclude fundamental mentality, is false. For that reason, no substance dualist should feel compelled to accept *closure_w*.

More significantly, no substance dualism *can* accept *closure_w*. It is incompatible with the possibility of interaction, and has, at its heart, the *stipulation* that dualism is false. If the causal exclusion argument is to be any threat to dualism, then, it cannot invoke, or otherwise rely upon, the truth of *closure_w*. Any argument against interactionist dualism that takes as a premise *closure_w* begs the question, for *closure_w* just is the denial of interactionist dualism.

§6.5 Final Thoughts on Closure

I have argued that none of the physicalist accounts that we have considered can support a causal closure principle that can be of use in a causal exclusion argument against interactionist dualism. On Melnyk's physicalism, *closure* is false. On Dowell's physicalism, *closure* is compatible with interaction. On Wilson's physicalism, *closure* begs the question that the causal exclusion argument purports to solve. None of these accounts, then, can provide what is needed in order to exclude mental causes from the physical world.

I hope now, briefly, to show that the problem lies not with these accounts in particular, but is rather a real, unavoidable result of Hempel's Dilemma. Consider the first horn of the dilemma—the claim that a physicalism based on *current* physics is almost certainly false. As far as I know, Melnyk is the only physicalist who has attempted to grasp this horn, and he does so only by *granting* the likely falsity of physicalism. As I hope to have shown, a physicalism that is (very probably) false yields a causal closure principle that is (almost certainly) false. No matter what the *physicalist* chooses to affirm, there is just no reason for a dualist to grant a principle that is so unlikely to be true. Unless the first horn can be grasped in such a way as to preserve the *truth* of physicalism, then, current-physics based physicalism can be of no use to the proponent of the causal exclusion argument.

There are, to be sure, more accounts that grasp the second horn than the two that I have here considered.²¹³ However, *all* of them must make the following choice: they can

²¹³ See, for example, J. Poland *Physicalism: the Philosophical Foundations*, (Oxford: Clarendon Press, 1994) Poland equates physics with the science of the occupants of space-time. If, as I have argued in Chapter Two, the occupants of space-time may very well include immaterial minds, this will also fail to

leave it to the physicists to tell us what will count as physical, and accept that the content of the concept can only be capture *a posteriori*, or they can choose, instead, to place *a priori* constraints on what can count as physical. If, like Dowell, they accept the former, they must accept the possibility of fundamental mentality. This possibility has not yet been ruled-out by the empirical science that is physics, and there is no good reason to assume that it *will* be ruled out. If, like Wilson, they accept the latter, then whatever *a priori* constraints they use to preclude the possibility of fundamental mentality will render their account precisely as question-begging as Wilson's is.²¹⁴

Hempel's Dilemma is a significant challenge to physicalism, and it is an even greater challenge to anyone who would raise the causal exclusion argument against interactionist dualism. Neither the first horn nor the second allows for a causal closure principle that can be of any use in the argument. The dualist, then, really ought not to go to any lengths to render her dualism compatible with *closure*; depending upon what is meant by “physical,” the principle is either *false*, *already compatible* with interaction, or *question-begging*.

exclude *sui generis* mental causes from the physical world. (In fn. 25, Dowell makes a similar, though not identical, point. She notes that Poland's account, unlike her own, would allow for miracle-performing angels, should they happen to occupy regions of space-time.)

²¹⁴ Question-begging, that is, *only insofar* as it is invoked in an *argument* against substance dualism. The physicalist is of course free to stipulate the falsity of interactionist dualism. What she may *not* do, of course, is to present those stipulations as *evidence against* interaction.

Conclusion

Despite its widespread acceptance, the claim that the physical world is causally closed is a dubious one. As we have learned from Hempel, the very notion of the physical world is far from clear, and without a consensus on what is meant by “physical” we can hardly claim consensus on what it means for the physical to be *closed*. Furthermore, as I hope to have shown, there is no good response to Hempel’s Dilemma, at least not as it pertains to causal closure. On the first horn, *closure* is false; on the second horn, it is either too weak or too strong to be of any use. I know of *no* statement of closure that can suffice as justification for the premises of the causal exclusion argument against interactionist substance dualism.

For this reason, I suggest that the dualist *just stop worrying* about closure. This is not to say that she should reject causal closure, for as we have seen an outright rejection might not be necessary. Instead, the precise way that a dualist ought to respond to a causal closure principle will depend upon how that principle is disambiguated in light of the questions raised by Hempel’s Dilemma. No matter how it is disambiguated, however, the result will not pose a real challenge to the dualist. For that reason, when responding to the causal exclusion argument, the dualist really would be better served by focusing her attention on *closure*, and not *exclusion*, as the problematic premise.

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