

A COSMOLOGICAL ARGUMENT AGAINST PHYSICALISM

MATS WAHLBERG
UMEÅ UNIVERSITY

Abstract. In this article, I present a Leibnizian cosmological argument to the conclusion that *either* the totality of physical beings has a non-physical cause, *or* a necessary being exists. The crucial premise of the argument is a restricted version of the Principle of Sufficient Reason, namely the claim that *every contingent physical phenomenon has a sufficient cause* (PSR-P). I defend this principle by comparing it with a causal principle that is fundamental for physicalism, namely the Causal Closure of Physics, which says that *every physical effect has a sufficient physical cause* (CC). I find that the evidence for Causal Closure is weaker than the evidence for PSR-P, which means that physicalists who take CC to be justified must concede that PSR-P is also justified, and to a higher degree. Since my Leibnizian cosmological argument succeeds if PSR-P is granted, I conclude that physicalists must either give up CC and thereby physicalism, or accept that a necessary being exists.

1. INTRODUCTION

Leibnizian cosmological arguments have two parts. The first part aims to establish the existence of a necessary being, and the second part argues that the necessary being is God.¹ Most of the debates concerning Leibnizian arguments have focused on the first part, and especially on what many take to be its crucial premise: the so-called Principle of Sufficient Reason (PSR). This principle comes in several different versions, for example the claim that *every contingent being has a cause of its existence*, or that *every contingent fact has an explanation*. The impor-

¹ William L. Rowe, *The Cosmological Argument* (New York: Fordham University Press, 1998), pp. 5-6. See also Alexander Pruss, "The Leibnizian Cosmological Argument," in *The Blackwell Companion to Natural Theology*, ed. William Lane Craig and J.P. Moreland (Oxford: Wiley- Blackwell, 2012), pp. 25-26.

tance of the PSR for the success of the cosmological argument is widely acknowledged. “Indeed, despite some notable dissent”, writes Alexander Pruss, “it now appears generally established that once one grants an appropriate version of the PSR, it follows that there is a necessary first cause of the cosmos”² The problem for cosmological arguers, however, is that PSR is not a very popular principle today. Many philosophers reject even weak modal versions of it, such as the claim that every contingent fact *possibly* has an explanation.³

The step-motherly treatment of the PSR in contemporary philosophy can be contrasted with the great popularity that another causal principle enjoys, namely the Principle of the Causal Closure of the Physical (CC). Roughly, this principle states that every physical effect has a physical cause — a claim that many philosophers view as very plausible. While the CC by itself is compatible with the existence of non-physical entities and even non-physical causes of physical effects (due to the possibility of causal overdetermination), the principle is often viewed as a crucial premise in arguments for physicalism.⁴

The difference in popularity between PSR and CC makes it interesting to compare the two principles with respect to evidential support. What is the evidence for them, respectively? The CC, according to David Papineau, is a “highly empirical claim”. “There is nothing conceptually contradictory in the idea that physical phenomena may be effected by non-physical causes, as Descartes supposed, for example. So the causal closure of physics, if true, must somehow follow from the findings of science”⁵ The PSR, on the other hand, is often defended by reference to a priori considerations, and it is even regarded as self-evident by some philosophers.⁶

² Alexander R Pruss, *The Principle of Sufficient Reason: A Reassessment* (Cambridge: Cambridge University Press, 2006), p. 4.

³ Graham Oppy, “On ‘a New Cosmological Argument,’” *Religious Studies* 36, no. 03 (2000): 345-353.

⁴ Daniel Stoljar, “Physicalism,” <http://plato.stanford.edu/archives/spr2016/entries/physicalism/>, Section 17; David Papineau, *Thinking About Consciousness* (Oxford: Oxford University Press, 2002), pp. 232-233.

⁵ David Papineau, “The Causal Closure of the Physical and Naturalism,” in *The Oxford Handbook of Philosophy of Mind*, ed. Brian McLaughlin (Oxford: Oxford University Press, 2009), pp. 60, 55.

⁶ For example, Pruss, *The Principle of Sufficient Reason*, chap. 11.

In this article, I am going to compare the two principles with respect to the degree of support they each receive from empirical and other evidence. More specifically, I am going to argue that a version of the PSR, which I will call PSR-P, receives at least an equal amount of empirical confirmation from the success of science as does the CC, so that the two principles are roughly equivalent considered as empirical hypotheses. The PSR-P, however, is also supported by two transcendental arguments that significantly increase its prior probability.

I will then show that this epistemic situation should cause deep concern for physicalists. The price they have to pay for their claim that CC is empirically justified, is that they have to concede that PSR-P is also justified, and to a higher degree than CC. And, as I will go on to show, the PSR-P can underpin a cosmological argument that establishes *either* the existence of a non-physical cause of the totality of physical beings, *or* the existence of a necessary being. Both sides of this disjunction are more or less unattractive for physicalists. The first side, because it contradicts CC and physicalism. The second side, because the idea of a necessary being is much less at home in a physicalist than in a non-physicalist (e.g. theistic) worldview. Unless this were true, it would be hard to understand why the first part of the traditional cosmological argument has received so much critical attention.

2. THE PRINCIPLE OF CAUSAL CLOSURE REFINED

David Papineau suggests the following refined version of the CC: “Every physical effect has an immediate sufficient physical cause, in so far as it has a sufficient immediate cause at all”⁷ Papineau’s main concern, which he shares with many defenders of the CC, is to formulate a principle that excludes irreducibly mental causes of bodily behavior. This is why his formulation includes the qualifications “immediate” and “sufficient”. Just to say that every physical effect has a sufficient physical cause would be compatible with the existence of physical causes that produce their effects only via non-physical intermediaries. In order to rule this out, the CC must require that the physical cause of any physical effect be *immediate*. Furthermore, unless the physical cause is *sufficient*, it cannot be ruled out that

⁷ Papineau, “The Causal Closure of the Physical and Naturalism”, p. 59. There seems to be a mistake in Papineau’s first formulation of this principle on p. 59. When he quotes his own formulation further down at the same page, the wording is different in a crucial respect, and the second version seems to express what Papineau intends.

some physical causes need to be complemented by irreducibly mental causes if certain physical effects are to come about.

A “sufficient cause”, however, cannot be understood (in all cases) as a cause that fully determines its effect. Modern quantum mechanics tells us that certain effects are random. Still, quantum theory “specifies that random physical effects have their *probabilities* fixed by sufficient immediate causes”, according to Papineau.⁸ So we might understand a “sufficient cause” to mean “a cause that either fully determines its effect or fully determines the chances of its possible effects.”⁹ According to Papineau, this means that “the appearance that quantum indeterminacy creates room for *sui generis* non-physical causes ... to exert a ‘downward influence’ on the physical realm” is illusory.¹⁰ Such *sui-generis* mental causes would have to affect the probabilities of their physical effects, but these probabilities are already fixed by sufficient physical causes.

While Papineau formulates the CC-thesis in terms of “physical effects”, Barbara Montero speaks instead of “physical phenomena”: “Every physical phenomenon that has a sufficient cause has a sufficient physical cause.”¹¹ By a physical cause, Montero means a cause that is “physical through and through”, which excludes non-physical intermediaries. Montero also shares Papineau’s understanding of what it means for a cause to be “sufficient”, namely, that it fixes the probabilities of its effects. Montero’s and Papineau’s formulations of the CC, therefore, seem to be equivalent, provided that we (quite naturally) take the terms “physical effect” and “physical phenomenon that has a cause” to be equivalent.

Papineau’s/Montero’s version of the CC-thesis seems to be the weakest version that can underpin an argument for physicalism. If this version is granted, the only way for non-physicalists to block an argument to the causal impotence of non-physical phenomena is by claiming that certain physical phenomena (e.g. human actions) are causally overdetermined by distinct causes in a systematic way, which can seem to be a far-fetched position.¹² Given the causal impotence of

⁸ Papineau, “The Causal Closure of the Physical and Naturalism”, p. 59.

⁹ Barbara Montero, “Varieties of Causal Closure,” in *Physicalism and Mental Causation: The Metaphysics of Mind and Action*, ed. Sven Walter and Heinz-Dieter Heckmann (Exeter, UK: Imprint Academic, 2003), p. 174.

¹⁰ Papineau, “The Causal Closure of the Physical and Naturalism”, p. 59.

¹¹ Montero, “Varieties of Causal Closure”, p. 174.

¹² E.J. Lowe, however, has a different view, see his “Physical Causal Closure and the Invisibility of Mental Causation,” in *Physicalism and Mental Causation: The Metaphysics of Mind*

non-physical phenomena, it follows that at least a part of the mind — the part that causes behavior, if there is such a part — must be physical. This leaves open, at best, the rather moot possibility that a causally non-*efficacious* part of the mind could be non-physical. Stronger versions of the CC exist, but those are more difficult to defend.¹³ I will therefore work with Papineau's/Montero's version. For clarity, I will use the following formulation:

(CC): Every physical phenomenon that has a sufficient cause has a sufficient physical cause.

For the purpose of this paper, it will not be necessary to address the question of how to define "physical". Physicalists are committed to the meaningfulness of the predicate "is physical", and — if physicalism is to be a metaphysically interesting claim that conflicts with (e.g.) substance dualism — physicalists are also committed to defining "physical" in a way that excludes irreducibly mental phenomena from being counted as physical.¹⁴

3. THE PRINCIPLE OF SUFFICIENT REASON RESTRICTED TO PHYSICAL PHENOMENA (PSR-P)

A principle of sufficient reason can be formulated in terms of explanation or in terms of causation. Since cosmological arguments (where the PSR originally belongs) are concerned with explaining the existence of *concrete* beings (or facts that involve concrete beings), the kind of explanation that is relevant is causal explanation. To provide a causal explanation is to point to a cause. In this article, I will use "causes" and "causally explains" interchangeably. The version of PSR I will defend, and compare with CC, is this:

PSR-P: Every (contingent) physical phenomenon has a sufficient cause.¹⁵

By "sufficient cause" I mean, like Papineau, a cause that only needs to fix the *probability* of its effect in order to count as "sufficient". This means that a common

and Action (Exeter, UK: Impint Academic, 2003), pp. 145-154.

¹³ See Montero, "Varieties of Causal Closure", pp. 174-175.

¹⁴ See Montero, "Varieties of Causal Closure", pp. 178-180.

¹⁵ I have inserted "contingent" to leave open the possibility that a necessary physical phenomenon exists. The qualification "contingent" will hereafter sometimes be left out.

objection to Leibnizian cosmological arguments — namely, that the existence of a sufficient reason or cause for every “contingent” phenomenon would actually do away with all contingency — is bypassed.¹⁶ Moreover, since the PSR-P is restricted to *physical* phenomena, the mentioned “modal fatalism” objection misses its mark also for this reason. Even if every *physical* phenomenon would have a deterministic sufficient cause, this would not entail that *every* phenomenon has such a cause, so modal fatalism does not follow. Furthermore, the possibility of libertarian free choices is not threatened by PSR-P, even if humans are wholly physical beings, so long as sufficient causes can be probabilistic. Neither is quantum indeterminacy contradicted by PSR-P, any more than it is contradicted by CC.¹⁷

It could be argued that the restriction of PSR-P to the physical domain is arbitrary. But this objection cannot be delivered by defenders of CC, since the CC itself is restricted in the same way. The PSR-P can, however, rightly be accused of involving a nebulous term, “physical phenomena”. Since this term also figures in CC, I will keep it for now in the interest of comparability, and replace it with a more precise notion later, when need for this arises.

4. EMPIRICAL SUPPORT FOR CC

David Papineau has summarized the empirical case for CC in terms of two interdependent arguments. Before I present those arguments, it is necessary to mention a third argument which was once popular, but which does not hold water, namely *The Argument from Conservation Laws*. It contends that the existence of physical conservation laws is incompatible with the existence of non-physical causes of physical events. However, as Papineau points out, the conservation of kinetic and potential energy is clearly consistent with the existence of non-physical forces, provided that those forces are governed by deterministic laws that guarantee that any kinetic energy that they “borrow” will always be “paid back”.¹⁸

¹⁶ For this objection, see for example Peter van Inwagen, *An Essay on Free Will* (Oxford: Oxford University Press, 1983), pp. 202-204; Jordan Howard Sober, *Logic and Theism: Arguments for and against Beliefs in God* (Cambridge, UK: Cambridge University Press, 2004), pp. 217-227.

¹⁷ For more elaborate responses to these last two objections, see Pruss, “The Leibnizian Cosmological Argument”, pp. 54-56, 58.

¹⁸ Papineau, *Thinking About Consciousness*, pp. 248-249. See also Lowe, “Physical Causal Closure and the Invisibility of Mental Causation”, pp. 137-140. It can also be questioned

Here are the two arguments endorsed by Papineau and (if not whole-heartedly) by Montero:

(1) *The Argument from the Explanatory Success of Science*. Papineau writes:

“This is the argument that all apparently special forces characteristically *reduce* to a small stock of basic physical forces which conserve energy. Causes of macroscopic accelerations standardly turn out to be composed of a few fundamental physical forces which operate throughout nature. So, while we ordinarily attribute certain physical effects to ‘muscular forces’, say, or indeed to ‘mental causes’, we should recognize that these causes, like all causes of physical effects, are ultimately composed of the few basic physical forces.”¹⁹

In more general terms, we may put the argument like this: The success of science has shown that a wide variety of physical phenomena are explainable in terms of physical causes (fundamental forces). Therefore, all physical phenomena are explainable in terms of physical causes, in so far as those phenomena are explainable at all (CC).²⁰

(2) *The Argument from Lack of Anomalies*. Papineau writes:

“The earlier argument suggested that most natural phenomena, if not all, can be explained by a few fundamental physical forces. This focused the issue of what kind of evidence would demonstrate the existence of extra mental or vital forces. For once we know which other forces exist, then we will know which anomalous accelerations would indicate the presence of special mental or vital forces. Against this background, the argument ... is then simply that detailed modern research has failed to uncover any such anomalous physical processes.”²¹

This argument supports CC by arguing for the non-existence of non-physical causes. If we have reason to believe that no non-physical causes exist,

whether non-physical causal agency necessarily requires the existence of non-physical fundamental forces.

¹⁹ Papineau calls this argument “the argument from fundamental forces”, Papineau, *Thinking About Consciousness*, p. 250.

²⁰ A different version of this argument has been formulated by Montero in terms of the completeness of physics. Premise 1): If CC were false, then physics would be necessarily incomplete. Premise 2): Physics is not necessarily incomplete. Hence, CC is true. If Premise 2 is plausible, it is so because of the success of physics, and Montero calls this argument an argument “from the success of science” (Montero, “Varieties of Causal Closure”, 177-180).

²¹ Papineau calls this an “argument from direct physiological evidence”, Papineau, *Thinking About Consciousness*, p. 253.

then we have reason to believe that all physical phenomena that have a cause have a physical cause (CC). Papineau claims that we have reason to believe that no non-physical causes exist, not simply because we lack evidence for the existence of such causes, but because if such causes existed, they could be expected to manifest themselves by producing events that are anomalous in relation to our knowledge of physical forces. It is hence the lack of (frequent) anomalous occurrences, in this sense, that gives us reason to believe that no non-physical causes exist, and hence that CC holds.²²

I am now going to argue that the circumstances that these two arguments appeal to in support of CC (the success of science and the lack of anomalies) provide evidential support for PSR-P to roughly the same extent as they do for CC. Since the degree of confirmation that a particular piece of evidence provides for a claim depends both on the claim's prior probability and on the claim's explanatory power in relation to the evidence,²³ I will discuss these two factors in turn, starting with prior probabilities.

5. THE (RELATIVE) PRIOR PROBABILITIES OF CC AND PSR-P

The prior probability of a claim or hypothesis — that is, the claim's "probability before we consider the detailed evidence of observation cited in its support" — depends on how well the claim fits with background knowledge, how simple it is, and how large or narrow scope it has.²⁴

Fit with background knowledge can seem to be an irrelevant factor in the present case. Recall that Papineau's arguments appeal to "the success of science" as evidence for CC. This means that the totality of scientific knowledge cannot be counted as background knowledge when we try to assess the prior probabilities of CC and PSR-P, because this knowledge is what Papineau

²² In fact, a stronger version of CC is entailed by the absence of non-physical forces, namely a thesis that says that physical effects have *only* physical causes. Lowe has a counter argument to the Argument from Lack of Anomalies, see Lowe, "Physical Causal Closure and the Invisibility of Mental Causation", especially pp. 150-151.

²³ The "explanatory power" of a hypothesis can be understood in Bayesian terms as the probability of the evidence given the hypothesis, divided by the prior probability of the evidence. See Richard Swinburne, *The Existence of God* (Oxford: Oxford University Press, 2004), chap. 6.

²⁴ Swinburne, *Existence of God*, p. 53.

proposes as “the detailed evidence of observation”. If there is any background knowledge that is relevant for the prior probabilities of CC and PSR-P in this context, it must be something else. Below I will argue that there is indeed very relevant background knowledge of a general kind to take into account, background knowledge that significantly increases the prior probability of PSR-P. But let us ignore “fit with background knowledge” for now, and focus on the other two determinants of prior probability, namely simplicity and scope.

Taken together, simplicity and scope determine the “intrinsic probability” of a hypothesis, the probability that it can be said to have *a priori*. Both CC and PSR-P are clearly very simple claims, and only two things distinguish them in this regard. First, CC makes a more specific claim than PSR-P in so far as CC ascribes a sufficient *physical* cause to physical phenomena, while PSR-P just says that physical phenomena have of cause *of some kind*. Second, the CC is a more qualified statement in so far as it only ascribes a sufficient physical cause to a certain sub-set of physical phenomena, namely those phenomena that have a sufficient cause. This leaves open the possibility that some physical phenomena might not have a sufficient cause. This qualification makes CC, arguably, somewhat less simple than PSR-P, which speaks unqualifiedly about “every (contingent) physical phenomenon”.

The *scope* of a claim or a hypothesis has to do with “how much [it] purports to tell us about the contingent features of the world”.²⁵ This obviously affects *a priori* probability. “In so far as [a claim] purports to apply to more and more objects and to tell you more and more about them, it is less probable. Clearly the more you assert, the more likely you are to make a mistake.”²⁶

It is difficult to compare the scopes of CC and PSR-P. The scope of CC is larger in so far as CC purports to tell us more about the nature of the causes that physical phenomena have. It is clearly more risky to claim that physical phenomena have a physical cause than to simply claim that they have a cause of some kind. In this respect, CC has larger scope than PSR-P (the former purports to tell us more about contingent features of the world). On the other hand, the scope of PSR-P is larger in so far as it purports to say something

²⁵ Paul Draper, “Natural Selection and the Problem of Evil”, Section 2, http://infidels.org/library/modern/paul_drapers/evil.html (accessed Feb 17, 2016).

²⁶ Swinburne, *The Existence of God*, p. 55.

about *all* (contingent) physical phenomena, while the CC only purports to say something about those physical phenomena that have a sufficient cause.

However, defenders of CC have reason to believe that the set of physical phenomena that have a sufficient cause is not *much* smaller than the set of *all* physical phenomena. Unless the great majority of physical phenomena have a sufficient cause, the success of science would be very unlikely. Normal scientific induction therefore seems to lead us to the conclusion that the great majority of physical phenomena have a sufficient cause. It is possible, of course, that causeless physical phenomena are very unevenly distributed throughout the universe, so that they are very common in parts of the universe that are presently beyond our reach. But if it is admitted that this possibility undermines the conclusion that the great majority of physical phenomena have a sufficient cause, then it must also be admitted that the same possibility undermines CC. Perhaps physical phenomena that have only *non*-physical causes are very unevenly distributed throughout the universe, so that they are much more common in parts of the universe that are presently beyond our reach? Since defenders of CC do not want to admit that the latter possibility undermines their inductive argument for CC, they cannot claim that the possibility of uneven distribution undermines the inductive argument for the conclusion that the great majority of physical phenomena have a sufficient cause. And if the great majority of physical phenomena have a sufficient cause, then it follows that the set of physical phenomena that have a sufficient cause is not much smaller than the set of *all* physical phenomena.

This means that defenders of CC must admit that the number of phenomena that CC makes a claim about is not much smaller than the number of phenomena that PSR-P makes a claim about. This, in turn, means that the scope of CC is not much smaller than the scope of PSR-P with respect to the number of phenomena that the two principles make a claim about.

It could be argued, then, that the total scope of CC is larger than that of PSR-P. A principle that claims that all physical phenomena that have a sufficient cause have a sufficient physical cause seems to make a riskier claim, *ceteris paribus*, than a principle that says that all physical phenomena have *some kind* of sufficient cause — given the commonly agreed understanding that the great majority of physical phenomena actually have a sufficient cause.

I will not make this argument, however. It is unclear how the two respects in which the scope of CC and PSR-P differ should be weighed against each other. What I take myself to have established so far is that CC and PSR-P are roughly equivalent in terms of simplicity and scope. Their intrinsic probability, in other words, is roughly the same. I take this conclusion to be generous.

6. THE (RELATIVE) EXPLANATORY POWER OF CC AND PSR-P

CC and PSR-P are different kinds of hypotheses. The former makes a claim about the nature of the causes that (the great majority of) physical phenomena have, the latter is the claim that all physical phenomena have a cause. This means that the two principles are not competing hypotheses. They are (at least *prima facie*) compatible.

In this section, I am going to argue that the empirical evidence that Papineau appeals to in support of CC is equally good evidence in favor of PSR-P. Both CC and PSR-P are compatible with the totality of empirical evidence, and they explain different aspects of it. In order to argue this point, I will adapt Papineau's two arguments for CC, and apply them in support of PSR-P.

The Argument from the Success of Science. Obviously, every case in which science has discovered a sufficient physical cause of some phenomenon is also a case in which science has discovered a sufficient cause *simpliciter*, which means that every success of science when it comes to finding a physical cause provides inductive support for PSR-P as well as for CC.

On the other hand, the cases in which science has *failed* to discover a sufficient cause of some phenomenon cannot be counted as evidence against PSR-P. Experience teaches us that causes are often difficult to find, and science proceeds on the assumption that it is always more likely that our failure to find the cause of some phenomenon is due to our present shortcomings rather than to the non-existence of a cause. If that assumption is justified (which most people believe it is), then we are *not* justified to count any particular failure to find a cause of some phenomenon as evidence against the very existence of a cause of that phenomenon. This is also true when science fails to find a cause after searching for a very long time. Nobody believes that the fact that science has not managed to satisfactorily explain the origin of

life is evidence that life originated without a sufficient cause, even though the search for an explanation has gone on for centuries.²⁷

The Argument from Lack of Anomalies. An anomalous event (an event that is unexpected in relation to our knowledge of physical laws) might not only be due to the intervention of a non-physical force. If PSR-P is false, then physical events can happen for no reason at all, and events that happen for no reason at all (i.e. causeless events) would also be unexpected given our knowledge of physical laws. This means that the lack of anomalous occurrences is evidence not only for the non-existence of non-physical causes, but also for the non-existence of causeless physical phenomena.

It could be argued that there is still a difference between CC and PSR-P with respect to the Argument from Lack of Anomalies. If science were to discover just *one* non-physical cause, then CC would be falsified. But how could PSR-P ever be falsified? It is impossible to conclusively establish that some phenomenon lacks a cause. Hence, since PSR-P is empirically unfalsifiable while CC could be falsified by the discovery of a non-physical cause, it seems that empirical considerations have more significance for the plausibility of CC than for the plausibility of PSR-P.

This argument is misconceived, however. The claim that CC is empirically falsifiable is, strictly speaking, false. Even if science would discover a non-physical cause of some physical phenomenon, it would still be possible that there is an (unknown) physical cause of that same phenomenon — in other words, that the phenomenon is causally overdetermined — and this possibility can never be conclusively ruled out. If it cannot be ruled out, then CC can never be conclusively falsified.²⁸ Of course, if science were to discover that a great number of physical events have non-physical causes, then the possibility of systematic causal overdetermination might seem far-fetched, and a good case for the falsity of CC could, perhaps, be made. However, there are also scenarios in which a good empirical case for the falsity of PSR-P could be made — for example, if our expectations concerning causal regularity were disappointed often enough. In a very irregular world, empirical con-

²⁷ Pruss, *The Principle of Sufficient Reason*, p. 278.

²⁸ There is another reason why CC could not be falsified: If we found what appeared to be a non-physical cause, it would still be possible that this cause is identical to some as-yet-unidentified physical phenomenon. (Thanks to an anonymous reviewer for pointing this out.)

siderations might lead us to question PSR-P, even if that principle is strictly speaking unfalsifiable.²⁹

It might still be argued that the inductive case in favor of CC is stronger than that in favor of PSR-P, because there is a very tight correlation between cases in which science has discovered a sufficient cause, and cases in which science has discovered a sufficient *physical* cause. There is no comparable, tight correlation that supports PSR-P. It is not the case, for example, that every physical phenomenon that science has investigated has been found to have a sufficient cause. However, the fact that science has sometimes failed to find the causes of some phenomena is best explained by the fact that it is often difficult to determine what causes something, as I argued above. So the absence of a tight correlation in this case should not be seen as a problem. On the other hand, the tight correlation between cases in which science has found a cause and cases in which science has found a physical cause, is not as strong evidence in favor of CC as one might think, because it rests on a biased sample. The tight correlation does not hold because there is a shortage of putative causal explanations — good causal explanations — that refer to non-physical causes. The correlation holds, instead, because those putative explanations are not counted as *scientific*. For example, we explain many of our actions in terms of reasons, and a reason is not — at least not *prima facie* — a physical entity. We might believe that every reason will eventually turn out to be, or supervene on, some physical entity, so that causal explanations involving reasons should not be counted as counter-examples to the tight correlation between discovered causes and discovered physical causes. However — and this is the crucial point — this is a prediction of what the future holds, similar to the prediction that every phenomenon which science has studied so far but failed to explain will *eventually* be explained in terms of a sufficient cause. It seems to me that the second prediction is no less well-grounded than the first.

We can put this in terms of explanatory power. A hypothesis H has explanatory power in relation to evidence E if and only if the probability of E given the truth of H is higher than the probability of E given the falsity of H.

²⁹ Of course, many philosophers of science would say that any scientific theory is, strictly speaking, unfalsifiable (the so-called Quine-Duhem thesis).

The bigger the “gap” between these two probabilities, the greater the explanatory power of the hypothesis.³⁰

CC and PSR-P are both compatible with all the evidence that Papineau adduces, but they explain different aspects of it. The fact that “whenever science has found a sufficient cause, it has found a sufficient physical cause” is more probable given the truth of CC than given the falsity of CC. In this respect, therefore, CC has explanatory power, while PSR-P has none, because PSR-P does not say anything at all about the nature of the causes of physical phenomena (that is, whether those causes are physical or non-physical). On the other hand, the fact that science is highly successful — that science has managed to explain a lot of phenomena in terms of sufficient causes — is *not* more probable given the truth of CC than given the falsity of CC. If no physical phenomenon had a sufficient cause, CC would be trivially true. This means that CC has no explanatory power in relation to the fact that science is successful when it comes to finding sufficient causes. In this respect, however, PSR-P has explanatory power. It is more probable that science would be very successful if PSR-P is true than if PSR-P is false. Of course, an alternative principle that says that *almost* all physical phenomena have a sufficient cause would explain the success of science almost equally well as PSR-P does. But an alternative version of CC that says that *almost* all physical effects have a physical cause would explain why science has only found physical causes almost equally well as CC does, especially if we take into account the fact that there is a clear reluctance within the scientific community to accept as *scientific* any proposed explanation that refers to a non-physical cause.³¹

7. OTHER ARGUMENTS FOR PSR-P

So far, I have argued that the empirical evidence does not give us reason to view either CC or PSR-P as less probable than the other. Their intrinsic probabilities are roughly equivalent, their explanatory power is complementary, and it is difficult to argue that one of the two has some distinctive em-

³⁰ See Swinburne, *The Existence of God*, p. 110.

³¹ This reluctance is certainly justifiable at the present time. My point is merely that *if* some physical phenomena actually have non-physical causes, it would require a paradigm-shift in science in order for those causes to be accepted as legitimate parts of scientific explanations.

irical advantage. Papineau's two arguments for CC, as we have seen, can be adapted in defense of PSR-P as well. However, while the empirical case (the arguments from science) is the *only* ground for belief in CC (as Papineau acknowledges), there are additional reasons to believe PSR-P. These reasons can be characterized as transcendental arguments³² that significantly raise the prior probability of PSR-P. One way to think about these arguments is to see them as highlighting PSR-P's deep fit with very general background knowledge.

The two transcendental arguments I will present are adapted from Alexander Pruss³³ (and Robert Koons³⁴). The first argument contends that PSR-P (or some broader version of PSR) must be assumed if inference-to-the-best-explanation is to work. Since this inference model is fundamental for the practice of science, it can be argued that PSR-P is entailed by our background belief that science produces knowledge. The second argument (2) says that PSR-P must be assumed if global skepticism is to be avoided. If this is correct, it can be argued that PSR-P is entailed by our background belief that we have knowledge of the objective world.

Here are the two arguments:

- (1) Science presupposes that for any physical phenomenon *x*, the best explanation of *x* is likely to be true. But this can only be presupposed if it is assumed that *x* has an explanation (that is, if it assumed that PSR-P is true). Without assuming PSR-P (or some more general PSR), the hypothesis that *x* lacks an explanation can never be ruled out. First, it cannot be ruled out as more improbable than other hypotheses, because phenomena that occur without a cause and hence *for no reason at all* cannot be assigned an objective probability. This is because the likelihood that a certain causeless phenomenon will occur cannot be grounded in any law of nature or any natural tendency (since such phenomena are not governed by any law or caused by any natural

³² By a "transcendental argument", I simply mean an argument that establishes the logical presuppositions of something.

³³ Pruss, "The Leibnizian Cosmological Argument", pp. 30-32, 28.

³⁴ Robert C. Koons, "A New Look at the Cosmological Argument," *American Philosophical Quarterly* 34, no. 2 (1997): 193-211.

tendency). Second, the no-explanation hypothesis cannot be ruled out on the ground that it lacks explanatory power, because this would be to presume that explanations are more likely to be true than non-explanations, and this can only be presumed given PSR-P. Third, it would be pointless to argue that causeless events — such as the coming to be of a brick in midair for no reason at all — would contradict the laws of nature. If the laws of nature really are incompatible with the occurrence of causeless physical phenomena, then, *ipso facto*, PSR-P holds. If it is argued that the laws of nature make causeless physical phenomena improbable, then the problem of ascribing an objective probability to such phenomena reappears. Furthermore, appealing to the laws of nature in this context is dialectically inappropriate. Our beliefs in the laws of nature are justified by inference-to-the best-explanation, and if the present argument is correct, we cannot rely on this kind of inference-pattern as truth-conducive unless PSR-P is true.

- (2) If physical phenomena can occur without a cause, then it is possible that our perceptual states occur without a cause. This skeptical possibility cannot be dismissed as improbable, because — as argued above — causeless phenomena have no objective probability.

We can hence argue as follows:

- (1) If PSR-P is not true, we do not have perceptual knowledge of the physical world.
- (2) We have perceptual knowledge of the physical world.
- (3) Hence, PSR-P is true.

Arguments of this kind contribute to raising the prior probability of PSR-P.³⁵ Furthermore, there seem to be no decisive *a priori* or transcendental ar-

³⁵ Pruss also has a number of other arguments (for a more general PSR), see Pruss, *The Principle of Sufficient Reason*, Part III. It might be seen as a problem that I argue *both* that PSR-P could be (quasi-)falsified if the world started to behave irregularly enough (section 6), *and* that PSR-P can be transcendently motivated by reference to the conditions for the

guments against PSR-P, or in favor of CC. The latter rests on empirical evidence only, according to its proponents. As I argued in section 2, the standard arguments against more general versions of PSR are not applicable to PSR-P, partly because its scope is limited to physical phenomena.

8. A COSMOLOGICAL ARGUMENT AGAINST PHYSICALISM

My conclusion so far is that CC and PSR-P, considered as empirical hypotheses, receive equal support from the scientific evidence. Unlike CC, however, PSR-P can also be defended on the basis of transcendental arguments that raise its prior probability significantly. Whether or not those arguments hold water, it must be granted by anyone that our pre-scientific intuitions and common experience favor PSR-P to a higher degree than CC. Prior to the eighteenth century, very few people would have found CC even remotely plausible, and it was not until the second half of the twentieth century that the principle became popular among philosophers. On the other hand, PSR-P — or more general versions of the PSR — has been taken for granted or even seen as self-evident by many throughout history. Today many people might be reluctant to accept, for example, that a certain plane crash was caused directly by God or by a ghost, or by some other non-physical entity, but given sufficiently compelling evidence, they would eventually accept it. It is more difficult to see what could convince people to accept that a plane crash happened *for no reason at all*.

In light of these sociological observations, and against the background of Alexander Pruss' transcendental arguments, it seems hard to deny that the prior probability of PSR-P is higher than that of CC. This means that *if* CC is plausible given the totality of evidence, then so *a fortiori* is PSR-P.

I will now present a cosmological argument that uses PSR-P as its crucial premise. In presenting this argument I will presume, following Papineau and others, that *facts* can be causal *relata*. This is a somewhat controversial posi-

possibility of objective knowledge. However, PSR-P can be seen both as an empirical hypothesis, and as a transcendently motivated principle. Empirical evidence might possibly defeat PSR-P considered as an empirical hypothesis, but once we realize that abandoning the principle will have serious philosophical repercussions, we might want to uphold it anyway on transcendental grounds.

tion. However, an argument equivalent to the one I am going to present could be formulated in terms of *obtaining states of affairs* as causal relata, or *situations*, or maybe even in terms of *events*, if the latter are simply understood as property-exemplifications.

As a preparation, I will formulate the PSR-P in a more precise way than I have done hitherto, by replacing the notion of “physical phenomena” with the notion “contingent facts concerning physical particulars”.³⁶ I assume that these two notions are either equivalent, or that the notion “contingent facts concerning physical particulars” has a smaller scope than “physical phenomena”.³⁷ By using the expression “physical particulars”, I assume a rather uncontroversial distinction between particulars (or concrete individuals) and properties, and I will assume that facts are composed of — or ontologically dependent on — particulars and properties. Given these preliminaries, the PSR-P can be formulated like this:

PSR-P₂: Every contingent fact concerning physical particulars has a sufficient cause.

From PSR-P₂ we can deduce the following, more restricted, principle:

PSR-P₃: Every contingent fact concerning the existence of physical particulars has a sufficient cause.³⁸

It is this latter principle that I am going to use in the cosmological argument.³⁹ The PSR-P₃ simply says that for all *x*s, if those *x*s are physical particulars, then the fact that those *x*s exist has a sufficient cause.⁴⁰ So this version of the principle is

³⁶ A “contingent fact concerning physical particulars” is a contingent fact that *merely* concerns physical particulars.

³⁷ However, if anybody questions this, it should be noted that nothing in my argument depends on the equivalence between these notions. See below, and footnote 39.

³⁸ The category of “facts concerning the existence of physical particulars” does not include negative existential facts. So the PSR-P₃ does not entail that the non-existence of unicorns must have a cause.

³⁹ This means that if somebody would argue that PSR-P₂ actually has a larger scope than the original PSR-P, this would not matter for my argument, which depends only on PSR-P₃. The latter clearly has a smaller scope than the original PSR-P.

⁴⁰ I have borrowed and adapted this formulation from Joshua Rasmussen, “Cosmological Arguments from Contingency,” *Philosophy Compass* 5, no. 9 (2010): footnote 8.

restricted to existential facts — facts about the existence of physical particulars — and it claims that there is a causal explanation of why the set of physical particulars has the members that it has. This means that PSR-P₃ has a much smaller scope than the original PSR-P, since the latter makes a claim about *all* kinds of facts concerning physical particulars. The PSR-P₃'s restriction to existential facts can be seen as an epistemic virtue that increases the intrinsic probability of the principle by reducing its scope. But the restriction could also be seen as arbitrary, and it could be suspected that the principle is gerrymandered for a certain purpose. This is why I have defended the more general PSR-P, which entails PSR-P₃.

Here is the argument:⁴¹

- (1) Every contingent fact concerning the existence of physical particulars has a cause (PSR-P₃).
- (2) The Big P — the fact that there are (or ever were) the very physical particulars that there are (or ever were) — is itself a contingent fact concerning the existence of physical particulars.
- (3) Therefore, the Big P has a cause.
- (4) No contingent fact concerning the existence of physical particulars can be caused solely by one or more of those very particulars that the fact contains, unless the fact contains a physical particular that exists by necessity.
- (5) Every physical particular is contained in the Big P.
- (6) Therefore, the Big P is *either* caused at least in part by something non-physical, *or* there exists a necessary physical particular.⁴²

Premise 1 — PSR-P₃ — must be granted by anyone who thinks that science makes CC belief-worthy, as I have argued above.

⁴¹ This argument is adapted from Rasmussen, “Cosmological Arguments from Contingency”, 811-813.

⁴² A tacit (but I believe uncontroversial) premise needed to arrive at this conclusion is that causation must involve concrete things (that is, particulars). Abstract entities, or facts involving merely abstract entities, cannot causally explain anything.

Premise 2 says that the Big P is contingent. This follows from the fact that if only *one* of the physical particulars that actually exist would not have existed, then the Big P would not have obtained. For example, if my computer had not existed, then the fact that there are the very physical particulars that there are (the Big P) would not have obtained. Since it is hard to deny that at least one physical particular that actually exists could have failed to exist, it must be admitted that the Big P is a contingent fact concerning the existence of physical particulars.⁴³

So there is no “fallacy of composition” being committed here — the fallacy of assuming that because all the parts of a whole are contingent, then so is the whole. Premise 2 does not claim that all the physical particulars that exist constitute a concrete whole. The premise only presupposes that there are *facts* about concrete particulars.

Premise 3 — that the Big P has a cause — follows deductively from 1 and 2.

Premise 4 says that a contingent fact concerning the existence of physical particulars cannot be caused to obtain merely by those very particulars it contains, unless one of those particulars exists by necessity. For example, the fact that the three things A, B, and C exist cannot be causally explained by reference merely to the particulars that compose the fact (A, B and C themselves). It is of course possible that C is caused by B, and B is caused by A, but then why does A exist? In order to answer this question without vicious circularity, either an external cause must be found, or A must be a necessary being, whose existence is not in need of a causal explanation.

When it comes to normal facts, such as the existence of three things, most people would agree with this. However, the Big P is a very special contingent fact, and it could be argued that the principle stated by premise 4 is not true if it is applied to a global fact such as the Big P. What if the Big P — the fact that there are the very physical particulars that there are — contains an *infinite* number of contingent particulars? In other words, what if there is an infinite regress of physical particulars, each of which was caused to exist by another particular? Then it might seem that we would not need to go outside of the set of physical particulars in order to explain the existence of each particular, even though none of those particulars exists by necessity. And the existence

⁴³ Rasmussen, “Cosmological Arguments from Contingency”, 813.

of each particular is all that we need to explain. So it might seem that premise 4 is false, if an infinite regress of causes is possible.

However, an infinite regress does not solve the circularity problem. In order to see this, suppose that somebody wanted to know the cause of the fact that there are humans, and it was suggested, in response, that the existence of each human is caused by another human, and so on in an infinite regress. This purported explanation would be circular, because whenever one human causes another human to exist, the fact that humans exist (at least one of them) *already obtains*. And it was *this* fact that we were asked to explain.⁴⁴ “Why do humans exist?” is not answered by saying that humans who cause each other have always existed.

The same goes for physical particulars in general. The fact that (contingent) physical particulars exist cannot be explained by saying that each physical particular is caused by another physical particular. A cause that is wholly “outside” of the fact to be explained (why there are the physical particulars there are) is needed, even if the number of physical particulars is infinite (unless there is a necessary physical particular).⁴⁵ This means that premise 4 cannot be rejected on the ground that an infinite regress of physical particulars is possible. Premise 4 is fully compatible with this possibility.

Premise 5 says that every physical particular is contained in the Big P. This is true in virtue of the definition of the Big P.

The conclusion — that the Big P is *either* caused at least in part by something non-physical (a claim that contradicts CC), *or* there exists a necessary physical particular — follows deductively from the premises, provided that

⁴⁴ William Rowe states why the purported explanation is circular: “If you are going to explain why there are *any* facts of a certain kind (where it is a contingent matter that there are facts of that kind), you cannot do so by citing a fact that is itself a fact of that very kind. For to do so is circular” (William Rowe, “Circular Explanations, Cosmological Arguments, and Sufficient Reasons,” *Midwest Studies in Philosophy* 21, no. 1 (1997): 197). I have substituted “fact(s)” for “truth(s)” in the quote from Rowe. See also Alexander Pruss, “The Hume-Edwards Principle and the Cosmological Argument,” *International Journal for Philosophy of Religion* 43, no. 3 (1998): 149-165; Rasmussen, “Cosmological Arguments from Contingency,” 812.

⁴⁵ See Michael Rota, “Infinite Causal Chains and Explanation,” *Proceedings of the American Catholic Philosophical Association* 81 (2007): 109-122. In this paper, Rota argues that “necessarily, for any infinite causal chain of caused beings, the complex fact that each of the members of that chain exists/existed is not explained by any complex fact which is only about the causal activities of the members of the chain” (121).

we (very reasonably) assume that only facts involving concrete items (particulars) can be causally efficacious.

In order to save CC and physicalism, it might be tempting for physicalists to accept the existence of a necessary physical being.⁴⁶ However, considering that the claim “a necessary being (of some kind) exists” is the conclusion of the first and most thoroughly debated part of the traditional cosmological argument, it must be viewed as a victory for cosmological arguers if this conclusion is granted, even with the qualification that the necessary being is physical. The debate can then move on to the second part of the argument, and address the question of how plausible the idea of a necessary physical being is in relation to the idea of a necessary non-physical being, such as God.⁴⁷

However, cannot a physicalist reject the crucial premise of the argument, namely PSR-P, in the name of ontological economy? Since PSR-P apparently can be used to establish the existence of a non-physical, causally efficacious being, it might be argued that this very circumstance means that PSR-P is a less simple hypothesis than CC. After all, the simplicity of a hypothesis depends in part on its entailments, and in this case it might seem that the entailments of CC are ontologically more austere than those of PSR-P. This means that ontological economy speaks in favor of CC, so that CC is justified to a higher degree than PSR-P, even though the two principles have a similar relation to the empirical evidence.

One problem with this response is that PSR-P does not entail the existence of a non-physical cause. It entails, together with some other premises, *either* the existence of a non-physical cause *or* the existence of a necessary

⁴⁶ Hume suggests this possibility (David Hume, “Hume’s Dialogues Concerning Natural Religion and the Posthumous Essays,” ed. Richard H Popkin (Indianapolis, IN: Hackett 1980), Part IX, 55). The idea is discussed in C. Stephen Layman, *Letters to Doubting Thomas: A Case for the Existence of God* (New York: Oxford University Press, 2006), chap. 4. Note that granting the existence of an *eternal* physical being (such as a quantum vacuum that has always existed, see for example Lawrence M. Krauss, *A Universe from Nothing: Why There Is Something Rather Than Nothing* (New York: Free Press, 2012), p. xii) will not help at all. If the eternal physical being is contingent (if it could have failed to exist in some possible world), the PSR-P requires that the fact that it exists has a cause.

⁴⁷ There are reasons to think that the non-physicalist position will be easier to defend in this debate, see Edward Feser, “The New Atheists and the Cosmological Argument,” *Midwest Studies In Philosophy* 37, no. 1 (2013): 171-172.

physical being. This means that the principle itself does not require us to go beyond a physicalist ontology. What might convince us to do this is if we have reason to believe that a necessary physical being does not exist. But this is an independent issue, and not an entailment of the PSR-P. Of course, if it could be shown that the idea of a necessary physical being is inconsistent, then it might be possible to strictly deduce the existence of a non-physical cause from PSR-P, together with the argument for the impossibility of a necessary physical being. Presently, however, such an argument does not seem to be available. What might be available are considerations that show that the existence of a necessary physical being is implausible.

In sum, it seems that the implications of the PSR-P are not a reason to view it as a less simple or coherent hypothesis than CC. To reject PSR-P simply because it entails either the existence of a necessary physical being or the existence of a non-physical cause seems to be rationally unmotivated.

9. CONCLUSION

This article shows that physicalists have a problem. The empirical evidence to which they appeal in support of their fundamental principle — the causal closure of physics (CC) — also supports, to at least an equal degree, a principle (PSR-P) that entails either the existence of a necessary physical being, or the existence of a (merely) non-physical cause of physical beings. The latter alternative is incompatible with CC, and the former is at least unattractive for physicalists. However, since physicalists accept CC *only* on the basis of empirical, scientific evidence, it is unclear on what ground they can reject PSR-P, which is supported by the same scientific evidence and has a higher prior probability. Non-physicalists, on the other hand, can argue that the empirical evidence is insufficient for establishing the truth of any of the principles. This is a plausible position. Considering that CC entails the non-existence of a creator God,⁴⁸ it is quite astonishing that so many contemporary philosophers claim that our current scientific evidence gives us sufficient

⁴⁸ The idea of a creator God, as it is understood in the monotheistic traditions, is the idea of a non-physical God who is the *sole* cause of the world's existence. The claim that such a God exists is incompatible with CC, even though CC is compatible with causal overdetermination. If there is a non-physical God who is just *one* cause of the world's existence (another cause be-

reason to accept it. Defenders of PSR-P, however, need not question their favored principle just because there is insufficient empirical evidence for it. They can instead follow Alexander Pruss and appeal to transcendental arguments.

The conclusion of this article is that defenders of causal closure face a dilemma: Either they have to abandon ship by rejecting CC and physicalism, or they have to accept that the first part of the cosmological argument succeeds.

ing something physical), then that God is not the creator-God assumed by the monotheistic traditions.