

No Ground to Bridge the Gap

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ABSTRACT

This paper examines an argument by Schaffer (2017) that aims to prove how, contrary to what many philosophers hold (e.g. Joseph Levine and David Chalmers), there is no *special* explanatory gap occurring in the connection between the physical and the phenomenal. This is because a gap of the same kind can be found in every connection between a more fundamental and a less fundamental level of reality. These gaps lurk everywhere in nature. For Schaffer, they can be bridged by means of substantive metaphysical principles such as grounding principles. He thus puts forward a version of grounding-based physicalism, which is supposed to provide this kind of substantive bridge principle. My main contention is as follows: even if Schaffer's argument indeed proves the existence of a gap in every connection between fundamental and derivative entities, and that such gaps can be bridged by means of grounding principles, a different gap remains open in the psycho-physical connection.

1. Introduction

Many philosophers agree that the scientific explanation of consciousness does not fully capture its nature. Any reductive theory about consciousness (e.g. any account of consciousness in physical or functional terms) seems to leave further questions unanswered: why are brain states conscious? Why is there something it is like to be in a particular brain state? In this sense, it is commonly held that an *explanatory gap* occurs between the physical and the phenomenal.¹ According to David Chalmers, this represents the *hard problem of consciousness*—as opposed to the *easy problem*, namely that of accounting for the functional aspects and the dynamics of consciousness (which can, in principle, be satisfactorily explained by neuroscience).² Some attribute this lack of explanatory connection to a limit of our current theories, whereas others take it to reflect a limit on our capacities as human beings and hold that we will never be able to bridge the gap.³ Some even claim that the gap cannot be closed in principle.

¹ This term was introduced in Levine (1983).

² Chalmers (2006, p. 225).

³ See McGinn (1989).

Nonetheless, the arguments for the existence of an explanatory gap are per se epistemological. In fact, they concern the lack of an explanatory link between the obtaining of determinate physical states and the fact that such states are accompanied by a certain phenomenal feel. Philosophers, however, disagree about what metaphysical conclusions we should draw from such a lack of an explanatory link.⁴ The following extract from Chalmers (2006) neatly states the core insight of the explanatory gap thesis:

Why doesn't all this information-processing go on "in the dark", free of any inner feel? Why is it that when electromagnetic waveforms impinge on a retina and are discriminated and categorized by a visual system, this discrimination and categorization is experienced as a sensation of vivid red? We know that conscious experience does arise when these functions are performed, but the very fact that it arises is the central mystery. There is an explanatory gap (a term due to Levine 1983) between the functions and experience, and we need an explanatory bridge to cross it.⁵

The explanatory gap thesis is supported by various arguments. Among the most discussed are Frank Jackson's Knowledge Argument⁶ as well as arguments from the conceivability of zombies⁷ and inverted qualia.⁸ All of these stem from the observation that there is no entailment from the physical to the phenomenal: from a complete physical/functional description of a creature, we cannot derive a priori what its qualitative states are like or even whether it is conscious at all.⁹

According to Jonathan Schaffer,¹⁰ there is nothing special about the explanatory gap occurring between the physical and the phenomenal because a gap of the same kind occurs in every connection between different layers of fundamentality. Schaffer aims at proving that it is not transparent from the fact that fundamental entities obtain that derivative (non-fundamental) entities should also obtain. As an example of this, he considers the link between atoms and molecules: as theories such as mereological nihilism are coherent, the possibility that atoms do not mereologically compose

⁴ See Van Gulick (2018). Some philosophers, such as Saul Kripke and David Chalmers, draw anti-physicalist conclusions from the explanatory gap thesis (Kripke, 1980; Chalmers, 1996) whereas others explicitly reject them. Note that Levine, who used to reject the view that the explanatory gap is due to a metaphysical gap between physical and phenomenal properties (see Levine, 1983; Levine, 2001), in his recent work endorses drawing anti-physicalist consequences as an inference to the best explanation (Levine, 2014).

⁵ Chalmers (2006, p. 229).

⁶ Jackson (1986). Some endorse a "weak" epistemic reading of the Knowledge Argument that avoids anti-physicalist commitments (see Nida-Rümelin & O'Conaill, 2019).

⁷ According to some philosophers, creatures that are physically identical to us but completely devoid of any conscious experience are conceivable. My "zombie twin" is physically and functionally identical to me, processes the same kind of information, reacts in the same way to inputs, and perceives things in the functional sense. But these functions are not accompanied by any conscious experience or by any phenomenal feel: "there is nothing it is like to be a zombie" (Chalmers, 1996, p. 95).

⁸ See Shoemaker (1982), Block (1990), and Chalmers (1996).

⁹ A notable example of such a discussion is Nagel (1974).

¹⁰ Schaffer (2017).

anything at all cannot be a priori ruled out. This means it is a priori unknowable whether, in this sense, molecules obtain. Substantive metaphysical principles are thus needed to bridge the gap. So, he puts forward a grounding-based physicalist account that allegedly provides these kinds of bridge principles.

I argue that even if Schaffer's formulation of the explanatory gap thesis corresponds to the standard account at first sight, a closer look reveals an important mismatch between the two. Even if we concede that Schaffer's argument actually proves the existence of a gap of some sort in every connection between the more and the less fundamental, and that such a gap can be bridged by means of grounding principles, a substantially different gap remains between the physical and the phenomenal.¹¹

In the second section, I present Schaffer's argument for the existence of explanatory gaps occurring not only in the mereological connection between atoms and molecules, but also in all connections between the more and less fundamental. In the third section, I argue that these gaps present a substantial difference from the explanatory gap as usually intended. The difference lies in the fact that Schaffer's gaps concern the impossibility of an a priori "ontological" ascent from fundamental entities to derivative entities. However, traditional conceptions of the psycho-physical gap concern the alleged lack of an a priori epistemic connection between physical facts and conscious experience *regardless of the ontological picture*.¹² Moreover, I claim that establishing ontological issues does not necessarily solve the epistemic problem, as there is an epistemic opacity in the psycho-physical connection that is independent of the ontological opacity. This, I argue, undermines Schaffer's claims that all gaps can be bridged by means of metaphysical grounding principles and that no *special* gap remains in the psycho-physical case. In the fourth section, I provide more details in support of my claim that Schaffer's grounding bridge principles are not suitable for answering all of the questions about the psycho-physical connection, in that they leave the initial question unanswered. To conclude, I briefly consider Schaffer's approach to the Knowledge Argument, which, I believe, can help elucidate how Schaffer's understanding of the explanatory gap differs substantially from the way it is usually conceived.

2. Schaffer's Gaps

2.1 Mereological Gaps

¹¹ A recent paper by Rabin (2019) deals with this issue. For this paper, which sides with Rabin, I aim to discuss in more details the difference between Schaffer's gaps and the residual explanatory gap between the physical and the phenomenal. Additionally, I aim at clarifying why the latter cannot be bridged by the kind of grounding principle that Schaffer invokes.

¹² Thanks to an anonymous referee for suggesting this formulation of the point at issue.

In *The Ground Between the Gaps* (2017), Schaffer claims there is no *special* explanatory gap between the physical and the phenomenal. This is because “there is no transparent rationale in any of the standard connections, even from the H, H and O atoms to the H₂O molecule, since it is not transparent that the H, H and O atoms compose anything, much less something with the nature of an H₂O molecule”.¹³ The literature sometimes takes the atoms-molecule link as an example of a transparent connection (as opposed to the opaque link between the physical and the phenomenal). Schaffer aims to prove that all connections between the more and less fundamental levels of reality are, in fact, opaque.

According to Schaffer, the link between the ground state and the grounded state is opaque if and only if it is conceivable, or logically possible, or a priori open that the ground state obtains without the grounded state obtaining.¹⁴ Schaffer claims that the connection between atoms and molecule is opaque in every relevant sense: it is indeed conceivable, logically possible, and a priori open that mereological nihilism is true and atoms do not compose anything whatsoever.¹⁵ Therefore, there is a Mereological Existence Gap between the atoms and the molecule. This means the claim that mereological composition occurs requires substantive mereological principles. Additionally, Schaffer states that a second kind of mereological gap occurs between the atomic and molecular levels. Even accepting that atoms mereologically compose something, it remains opaque whether their fusion has the right nature (e.g. the right causal properties) to count as a molecule. This is because “for all classical mereology is concerned, that fusion could be a cabbage”.¹⁶ Schaffer refers to the view that sees composite objects as epiphenomenal, and therefore lacking causally relevant properties, as zeroism. Since zeroism is conceivable, logically possible, and a priori open, there is also a Mereological Nature Gap between the atoms and the molecule: it is conceivable, logically possible, and a priori open that hydrogen and oxygen atoms compose something that is not a water molecule. To determine the nature of the composite entity, additional metaphysical principles of property inheritance are needed.

Schaffer claims that the Mereological Existence Gap and the Mereological Nature Gap are sufficient to identify the existence of an explanatory gap in the connection between the atomic and molecular levels. He observes how “being told that there are the plurality of H, H, and O atoms

¹³ Schaffer (2017, p. 2).

¹⁴ According to Schaffer, these are three not-obviously-equivalent ways of defining opacity.

¹⁵ A relevant difference between the atoms-molecule connection and the psycho-physical connection, as Schaffer acknowledges, is that the first involves properties instantiated at different levels of aggregation while the second does not. However, the analogy between the psycho-physical case and the atoms-molecule case is based on the fact that both connections can be understood as connections between a more fundamental level of reality and a less fundamental one (see Schaffer, 2017, pp. 4-5).

¹⁶ Schaffer (2017, p. 7).

bonded in the right pattern is not sufficient information” to know whether a water molecule exists.¹⁷ One must still open the “ontological books” to check whether the world actually gives out any individual with the needed features.

2.2 General Existence and Nature Gaps

Schaffer states that this gap can be generalized to all cases where we move from the more to the less fundamental.¹⁸ In the case of the *existence* gap, the generalization of mereological nihilism is “flatworldism”,¹⁹ namely the view that only fundamental entities exist. Like mereological nihilism, flatworldism is conceivable, logically possible, and a priori open. Hence, it is not transparent from the obtaining of fundamental entities that any non-fundamental entity obtains. In the case of the *nature* gap, Schaffer calls the generalization of zeroism to all concrete inter-level connections “ghostworldism”. This is the view that non-fundamental entities exist, but are epiphenomenal. Like flatworldism, ghostworldism is conceivable, logically possible, and a priori open. Therefore, it is not transparent from the obtaining of fundamental entities that any non-fundamental entity has the right nature to count as a molecule, an animal, or anything else.

From this, Schaffer concludes that General Existence and Nature Gaps lurk everywhere in nature: it is conceivable, logically possible, and not a priori knowable otherwise that there are no derivative entities (flatworldism), or that derivative entities are epiphenomenal (ghostworldism). So, explanatory gaps occur in every connection between the more and less fundamental. These gaps can be bridged only by substantive grounding principles, which are needed to determine whether there are derivative entities and what they are like.

Even if we accept Schaffer’s conclusion and concede that General Existence and Nature gaps lurk in every concrete connection, I am not convinced that Schaffer’s account corresponds with the traditional account of the psycho-physical explanatory gap. In what follows, I mainly focus on the *existence* gap (derived from the a priori openness of flatworldism) rather than on the *nature* gap (derived from the a priori openness of ghostworldism). I argue that there is a substantial difference between Schaffer’s existence gap and the explanatory gap as it is usually understood. This difference undermines Schaffer’s claim that there is no *special* explanatory gap in the psycho-physical case.²⁰

¹⁷ Schaffer (2017, p. 9).

¹⁸ Schaffer refers only to concrete connections rather than logical or mathematical ones (e.g. the connection between the truth of P and the truth of P ∨ Q), which he assumes to be a priori knowable.

¹⁹ A term due to Bennett (2011). In fact, according to Bennett, a world in which *everything* (i.e. molecules, tables, minds etc.) is fundamental would also be a flatworld by definition.

²⁰ I believe such a difference can be appreciated more neatly if we consider the existence gap instead of the nature gap. An additional discussion of the nature gap would certainly be interesting. But to my mind, it is dialectically less useful for the sake of clarifying the relevant disanalogy between Schaffer’s gap and the psycho-physical gap as usually conceived (although I suspect my argument may apply also to the nature gap). Note that by “nature” of non-fundamental entities, Schaffer means their properties (e.g. mass, charge, solvability). Yet the issue of whether something is physical or not, or

3. Two Kinds of Gaps

Various formulations of the explanatory gap thesis share a common core that can be expressed as follows:

(EG) Why does being in a determinate physical state feel the way it does, rather than some other way or no way at all?

Below, I argue that Schaffer's notion of an explanatory gap and EG are different in kind. This is because the former refers to a metaphysical gap, while the second indicates an explanatory gap.

3.1 Metaphysical vs. Explanatory Gaps

I use the label metaphysical (or ontological) gap to indicate a gap due to an opacity in the connection between different ontological levels: from the fundamental level, we cannot a priori determine what higher-level entities, if any, figure in the so-called ontological books. This epistemic opacity is tied to what are strictly ontological issues, or issues concerning the ontological status of the entities in question—hence the label metaphysical/ontological gap.²¹ The metaphysical gap between atoms and molecule derives from the impossibility of a priori ruling out the truth of mereological nihilism, hence that certain atoms arranged “molecule-wise” do not actually compose a molecule (that there are no molecules in our ontology). In Schaffer's general case, the metaphysical gap occurs between the more and less fundamental due to the impossibility of a priori ruling out the truth of flatworldism, and thus that no ontological levels arise above the fundamental level at all. For all we know a priori, the world might “flatten out” above the microphysical level—what we ordinarily describe as molecules, tables, conscious states etc., could ontologically be nothing more than configurations of fundamental entities.

In contrast, the explanatory gap between the physical and the phenomenal is per se independent of the ontological picture. Such a gap is due to the alleged impossibility of determining a priori from the physical facts whether what we *ordinarily* call conscious experience occurs at all, regardless of whether consciousness figures in the ontological books. As our physical (e.g. neurophysiological) theories lack the right information to determine whether we are conscious, given a complete physical knowledge it is not possible to a priori rule out that no conscious experience is

whether it has a physical or non-physical “nature”, seems to concern more the *existence* kind of gap. Given that the physical is taken as fundamental, the *existence* question about consciousness is tied to the question of whether it has a physical or non-physical nature (i.e. whether it is physically reducible).

²¹ Strictly speaking, a metaphysical gap is also an “explanatory” gap. Grounding connections tell us that derivative entities obtain *in virtue of* more fundamental entities and, in this sense, they are considered explanatory connections. But these “metaphysical” gaps involve ontological issues (issues concerning the ontological status of the entities in question), while the explanatory gap does not.

associated with a certain brain state. The fact that it is painful to have C-fibres firing, for example, seems a priori unknowable, regardless of whether what we ordinarily call “pain” is in fact a phenomenal property or just a pattern of neural activity. Moreover, even if we could a priori derive from the physical facts *that* certain brain states are perceived in a certain way, we would still arguably be unable to know *what it is like* to be in a certain brain state.

I believe the relevant difference between Schaffer’s gaps and the psycho-physical explanatory gap can be expressed in terms of a distinction, due to Chalmers, between ontological and ordinary existence assertions. Ontological existence assertions are issued inside the ontology room, so to speak, while ordinary existence assertions are those made in ordinary, first-order discourse.²² The correctness of an ontological existence assertion is sensitive to the specific metaphysics that one endorses. In Schaffer’s account, any assertion about the presence of molecules in the world is intended as committing to the presence of molecules in our ontology—hence, to the claim that mereological nihilism is false.²³ In contrast, the correctness of an ordinary existence assertion is not sensitive to any specific ontological view. The distinction between these two types of assertions should be as acceptable to ontological realists as to ontological anti-realists. In fact, it is crucial for those whose metaphysics deny some claims of common-sense ontology (such as mereological nihilists) to allow a sense in which certain existence assertions can be considered correct—even if, strictly speaking, they are false.²⁴ An assertion about the phenomenal feel that accompanies a certain brain state is part and parcel of EG. I contend that this assertion should be understood as an *ordinary* existence assertion. It does not require one to open the ontological books and check for the presence of phenomenal states: its correctness is consistent with such phenomenal states lacking ontological substantiality.

Mereological nihilists can thus plausibly allow an ontologically neutral sense in which the existence of atoms arranged molecule-wise allows us to speak *as if* there were molecules. Or they may concede that there are “illusory molecules” (atoms arranged molecule-wise that seem like

²² Chalmers (2009a, pp. 80–85).

²³ Schaffer (2009) endorses a form of ontological permissiveness in which derivative entities are heavyweight entries in the list of entities. In this sense, the truth of an existence assertion about molecules depends on whether molecules are part of our ontology. In some views, however, derivative entities do not constitute a further ontological commitment.

²⁴ The difference between an ontological existence assertion and an ordinary existence assertion can also be understood as a difference between two ways of assessing sentences, rather than a difference between two sorts of utterances (Chalmers, 2009a, p. 83). It is plausible, according to Chalmers (2009a), that the correctness of an ontological existence assertion coincides with its truth (i.e. that an ontological existence assertion is correct if and only if it is true). In contrast, the correctness of an ordinary existence assertion might be “some sort of pragmatic evaluation” or “intuitive acceptability in light of empirical truths and first-order reasoning”. If mereological nihilism is true, for example, ordinary existence assertions about macroscopic objects might be assessed as false but correct. As truth depends on how things are in the world, so does correctness: the correctness-conditions reflect the way the speaker takes the world to be and the conditions that are required for the hearer to accept or reject an assertion (Chalmers, 2009a, p. 82).

molecules but are not, in fact, molecules).²⁵ Analogously, even if what we ordinarily call conscious experience were ontologically nothing more than neural activity, it would be hard to deny that we feel something when our C-fibres are firing. Even eliminativists about the phenomenal (“phenomenal nihilists”) acknowledge that we have conscious experiences in this *ordinary*, ontologically neutral sense. They simply deny that such conscious experiences involve the instantiation of genuine and “unified” phenomenal properties. In this sense, conscious states may be illusory: they may seem to instantiate genuinely phenomenal properties while, actually, they do not. However, this does not mean that there is nothing it is like to have them. Eliminativists and realists about consciousness agree that there is something it is like to be in pain, or to be conscious, in this ontologically neutral sense. They disagree on the ontological issue of whether this involves the instantiation of phenomenal properties.²⁶

The disanalogy is that, supposedly, we cannot a priori derive from the physical facts whether we are conscious in the ordinary sense, regardless of the ontological picture. In contrast, it is usually held that we can a priori derive whether there are molecules in the ordinary sense (i.e. atoms arranged molecule-wise), regardless of the ontological picture. Contrary to what Shaffer seems to suggest, the psycho-physical explanatory gap is not due to the impossibility of a priori ruling out the truth of flatworldism or phenomenal nihilism. The gap is due to the impossibility of a priori ruling out that conscious experience does not occur at all, even in the ordinary sense—for what we can know a priori, the world might be a zombie world. *Zombies* lack, *ex hypothesi*, any conscious experience whatsoever: there is nothing it is like to be a zombie. Explanatory gap theorists usually acknowledge that zombies behave as if they were conscious. *Zombies* may even believe that they are conscious. These theorists still hold that zombie beliefs are not only false, but also not justified: zombies lack the introspective evidence that justifies us in believing we are conscious. My zombie twin and I are alike from a third-person point of view, but not from the first-person one.²⁷

EG only requires that there is something it is like to be us in the ordinary sense, and that this is not obviously derivable from the physical facts. Eliminativists (e.g. Dennett 1991) typically claim that, since there are no phenomenal properties, strictly speaking there is nothing to explain about consciousness besides physical processes and functions. As said, however, they also grant that there is something it is like to be us in an ordinary sense. They may deny that this constitutes a genuine

²⁵ Rejecting this basic claim would make mereological nihilism an absurd view. More importantly, it would be a view that we can, in fact, a priori rule out: it is quite uncontroversial that we can (ideally) derive that there are fundamentals arranged X-wise from the physical facts alone.

²⁶ Dennett, for instance, acknowledges that conscious experience is real and that it has properties. He simply denies that such properties have the features that we usually attribute to qualia—i.e. that they are intrinsic, ineffable, etc. See Dennett (1991, 1988).

²⁷ See Chalmers (1996, pp. 198–199).

explanandum. Alternatively, they may claim that the fact that we are conscious in the ordinary sense (i.e. that we *seem* to be conscious) is indeed a priori derivable from the physical facts, at least in principle.²⁸ In this respect, they may also argue that zombies are inconceivable if they are characterized as creatures who are microphysically identical to us but lacking conscious experience even in an ordinary sense. The explanatory gap problem, in this view, is thus an easy problem, to use Chalmers' label. But proponents of EG reject all of these claims. For them, the ordinary existence of consciousness constitutes a genuine explanandum, and what it is like to be conscious cannot be derived a priori from the physical facts. Also, as zombies are a priori coherent, they are conceivable.²⁹ Schaffer himself grants that zombies are conceivable (2017, p. 18) and (hence) that there is an explanatory gap between the physical and the phenomenal. So for the sake of the argument, I shall set this view aside.³⁰

Having said that, the relevant difference between Schaffer's gaps and the psycho-physical one should now be clearer. In the case of the atoms-molecule connection (along with most concrete connections between the more and less fundamental), there is a *metaphysical* gap but not an *explanatory* gap. It is widely agreed that we can reduce facts about atoms arranged molecule-wise to facts about atoms because we have an explanation of how atoms form chemical bonds.³¹ Indeed, we are (supposedly) able to derive from an ideally complete physical knowledge that there are atoms arranged molecule-wise: we are able to a priori determine that the world is arranged *as if* there were molecules. There is thus no opacity in the connection between atoms and their chemical composition. However, Schaffer may be right that without substantive metaphysical principles, we cannot know whether there are molecules.

²⁸ See, for example, Dennett (1991) and Frankish (2016).

²⁹ As Chalmers (1996) argues, it seems that eliminativist arguments at best show the nomological impossibility of zombies (which is compatible with anti-materialism), but not that zombies are inconceivable. Thanks to an anonymous referee for suggesting to clarify this point.

³⁰ It can be argued that, whether or not there actually are genuinely phenomenal properties, why we are (or seem to be) conscious is not obviously transparent from the physical facts, and that this engenders the explanatory gap between the physical and the phenomenal. In contrast, whether or not atoms arranged molecule-wise are actually molecules, it is transparent from the physical facts that there are atoms arranged molecule-wise and why it is so. In other words, the phenomenal aspect of pain, which seems to exceed its physical base, could be nothing more than an introspective misrepresentation of physical processes (as some eliminativists claim). But the gap would still not be bridged until we found an explanation of how this misrepresentation gives rise to conscious experience. In defense of the explanatory gap thesis, it can be argued that, even if we could ideally derive a priori from the physical facts *that* such a misrepresentation occurs, it would still be impossible to know that it is accompanied by a certain first-person experience (that it is *felt* in a certain way). Most of all, it would be impossible to know *how* such an experience feels like. Additionally, even if the absence of phenomenal properties were sufficient to establish that there is no explanatory gap (not even one that is bridgeable in principle), the explanatory gap would still not derive from the a priori openness of eliminativism, as Schaffer's account seems to entail. At most, the explanatory gap thesis would *presuppose* that eliminativism is false.

³¹ What is at issue is not whether different arbitrarily chosen objects *mereologically* compose a whole. There is also a concrete sense in which atoms are connected. An explanation of such a connection plausibly involves the attraction between atoms or the behaviour of their valence electrons, etc. It does not concern the metaphysical debate between the mereological nihilist and the mereological universalist.

In the case of the psycho-physical connection, on the other hand, we have two kinds of gaps. One is the explanatory gap discussed above, which derives from the absence of a proper explanation for why neural states are accompanied by experience. At best, it is claimed, neuroscience provides *correlations* between certain brain states and the way they are phenomenally perceived. Regardless of the ontological picture, the chemical theory of H₂O provides an epistemic connection between atoms and (what we ordinarily call) water molecules. In contrast, EG can be interpreted as the view that, regardless of the ontological picture, neuroscience does not provide an epistemically satisfactory connection between brain states and what it feels like to be in them.³²

Ontological existence questions (such as whether an instance of pain is an instance of a genuinely phenomenal state, or whether certain atoms arranged molecule-wise compose a molecule) can be rephrased as conceptual questions (whether an instance of pain *counts as* an instance of a genuinely phenomenal state, or whether certain atoms arranged molecule-wise *count as* a molecule).³³ Although I sympathize with a conceptual understanding of these kinds of questions, it can be conceded to Schaffer that they are substantive for the sake of the argument. But I take it that the relevant disanalogy between Schaffer's account and the traditional conception of the explanatory gap remains in either case. The issue of whether a creature with a certain physical structure is conscious (in the ordinary sense) is not a conceptual one. Nor is it a metaphysical one in Schaffer's sense, as the mere empirical observation that we are conscious does not per se commit to the existence of genuine phenomenal properties.³⁴

If Schaffer is right, an additional *metaphysical* gap occurs in the psycho-physical connection: in the absence of relevant *metaphysical* principles, we cannot establish whether consciousness can be found in the ontological books (as Schaffer puts it). The "phenomenal nihilist" and the realist disagree on whether the occurrence of conscious experience in the ordinary sense, or the appearance of conscious experience, actually is/counts as *genuine* conscious experience (i.e. entails the existence of phenomenal properties). This can be considered either a metaphysical or a conceptual question, just as with the question of whether atoms arranged molecule-wise count as molecules.³⁵

³² To put the point in the words of Chalmers (1996), EG is concerned with the question "can consciousness be explained by physical theories?" and not with the question "is consciousness itself physical?" (p. 123). As stated, some claim that we can indeed derive (in principle) whether a creature is conscious from a physical description of it. Hence, for them, the explanatory gap problem is a so-called easy problem. But this is something that proponents of the explanatory gap thesis and Schaffer himself deny. Moreover, arguably we would still lack information about what being conscious *feels like*.

³³ Thanks to an anonymous referee for suggesting this point.

³⁴ Note that Schaffer explicitly argues against the interpretation of metaphysical issues as conceptual issues. He claims that ontological deflationism (i.e. the view that ontological questions are non-substantive) cannot be a premise to the argument for the existence of the explanatory gap. Additionally, he claims that, in any case, a deflationist view cannot help maintain a special explanatory gap in relation to the phenomenal (see Schaffer, 2017, pp. 6, 9, 21–22). My concern is not whether Schaffer has inflated the ontological questions. Rather, my concern is that this kind of question, on whose substantiality I shall remain neutral, should not be the issue at stake.

³⁵ For the sake of clarity, I am not claiming that the metaphysical gap is less genuine than the explanatory gap. I just hold that they are two different kinds of gaps.

The contrast between Schaffer's cases and the psycho-physical case can be rephrased in terms of a priori openness/conceivability.³⁶ Whether in the atoms-molecule case or the psycho-physical case, metaphysical gaps are engendered by the a priori openness/conceivability of the relevant nihilist scenario. There may indeed be no molecules, for instance, only atoms arranged molecule-wise. Likewise, there may be no phenomenal properties—only brain states that are perceived in a certain way. But understanding why they are perceived in that way (or perceived at all) is the real crux.

This means Schaffer might be right that, since flatworldism cannot be a priori ruled out, it is a priori open/conceivable that a world with a certain physical arrangement could be devoid of molecules, or of consciousness, or of any non-fundamental entity. However (and here lies the relevant difference), it is in principle a priori knowable that a world with that physical arrangement contains particles arranged molecule-wise. It is a priori derivable that the world is arranged “as if there were molecules”. Hence, it is not conceivable that the world could be arranged otherwise. On the contrary, it is still a priori open/conceivable that a world with that physical arrangement is a zombie world, devoid of even the illusion of conscious experience. It is not a priori derivable that such a world is arranged “as if there were consciousness”.³⁷ In this sense, there is an epistemic opacity in the psycho-physical connection that is independent of the ontological opacity.

3.2 Ontological Reduction and Reductive Explanation

Once it is established that the world has a certain physical layout, all that remains in the atoms-molecule case is the ontological existence question of (M) whether molecules actually exist (the question of whether they figure in the ontological books). But once it is established that the world has a certain physical layout, in the psycho-physical case there remain two kinds of questions. The first

³⁶ Note that Levine (2006) argues that the a priori non-derivability of the phenomenal from the physical is not the central issue. This is because there are cases of non-derivability, such as the water-H₂O identity, in which no explanatory gap occurs. But logical possibility, conceivability, and a priori openness play a pivotal role in Schaffer's argumentative strategy. I thus decided to focus on these issues regardless of whether this is indeed the best way to approach the explanatory gap question. A priori openness, conceivability, and non-derivability are strictly connected: the fact that it is not possible to a priori rule out that a physical duplicate of our world is not also a phenomenal duplicate is closely linked to the fact that phenomenal facts are not a priori derivable from physical facts, and to the conceivability of the relevant physical facts obtaining without any conscious experience occurring. Moreover, even if we set aside the issue of a priori derivability, the relevant difference arguably remains: following Levine, it can be argued that, even a posteriori, a reductive explanation of molecules (an account of molecules in terms of atoms and chemical connections) will seem perfectly intelligible, while any reductive explanation of pain in terms of the firing of C-fibres will appear “arbitrary”. This is why, according to Levine, the psycho-physical explanatory gap occurs regardless of a priori derivability. This issue will be discussed in section 3.2.

³⁷ See Rabin (2019). It is not a priori derivable that we are conscious or what being conscious is like, regardless of whether there are genuine phenomenal properties.

is whether there is something it is like to be in a certain brain state (the ordinary existence question).³⁸ The second is (C) whether consciousness actually exists (the ontological existence question).

Schaffer's a posteriori grounding physicalism is supposed to bridge the metaphysical gaps engendered by our a priori ignorance of C and M. Ground Physicalism claims that chemical, biological, and psychological phenomena are ultimately grounded in the physical—i.e. that chemical, biological, and psychological facts obtain *in virtue* of the obtaining of physical facts. As said in previous sections, grounding bridge principles are supposed to add information about the dependence functions at work in the connections between different levels of reality.³⁹ However, I contend they cannot bridge the psycho-physical *explanatory* gap: even if we could a posteriori show that the physical grounds the chemical and the psychological, the epistemic connection between a certain pattern of neural activity and the specific way it feels would remain opaque.

Although a priori deriving facts about conscious experience from the physical facts would show (a priori) that consciousness is physical, the alleged impossibility of doing so does not necessarily show that physicalism is false. Some claim that physicalism can be established a posteriori.⁴⁰ Nonetheless, it can be argued that answering a posteriori the metaphysical questions about consciousness (whether there are phenomenal properties, whether they are metaphysically necessitated by physical properties, etc.) does not immediately answer the explanatory question (EG). The a posteriori establishment that consciousness is physical, or that it is grounded on the physical as in Schaffer's Ground Physicalism, is not necessarily explanatory with respect to the question of why we are (or seem to be) conscious in the first place.⁴¹

Levine thus argues that the appeal to a posteriori, metaphysically necessary, psycho-physical connections as bridge principles in psycho-physical reductions leaves the explanatory gap open.⁴² Psycho-physical ontological reduction does not seem to entail psycho-physical reductive *explanation*. Regardless of a priori derivability, Levine claims there is an epistemic contrast between psycho-physical reductions and standard theoretical reductions. The former allow further intelligible requests for explanation. In contrast, once all the empirical information is supplied in standard cases, any

³⁸ This question is strictly connected to the EG question. The insufficiency of the physical facts to permit deriving whether conscious experience obtains (in the ordinary sense) is strictly tied to the fact that we find it conceivable that being in a certain brain state could feel some other way, or no way at all.

³⁹ Some argue that grounding principles do not aptly account for metaphysical connections, which are best characterized in terms of what Wilson (2014) calls "small-g" grounding relations (e.g. identity, functional realization, etc.).

⁴⁰ Some physicalists, the so-called type-B physicalists, claim that the a priori non-derivability is due to a conceptual gap between phenomenal and physical concepts. In this view, the gap is arguably a permanent feature of our epistemic condition. But it has no metaphysical consequence whatsoever.

⁴¹ Moreover, Chalmers claims that a posteriori non-fundamental psycho-physical bridge principles are unacceptable because they commit to the existence of "strong necessities" (to a metaphysical modality independent of conceivability). They are also epistemically primitive (not grounded in conceptual analysis). Materialism, according to Chalmers, requires *logical* supervenience (i.e. a priori entailment from the physical facts to any other fact). See Chalmers (2009b).

⁴² Levine (2001, 2006).

further request for explanation is unintelligible. We find the theoretical reduction of water explanatory because we fully understand why water is liquid at room temperature, clear, drinkable, etc. in virtue of its chemical properties: the connection between water and H₂O is, in this sense, transparent. But in the case of psycho-physical reductions, the connection between the neurological description of pain, for example, and our first-person conception of that state appears arbitrary even after all of the relevant empirical information has been supplied. This particular neural state could seemingly have been accompanied by a different experience, or none at all. In this sense, even the appeal to (a posteriori) type-identities does not help.⁴³ Normally, identities are not the kind of thing that stands in need of explanation. According to Levine, however, psycho-physical identities are “gappy”—the question of how pain can “just be” the firing of C-fibres is a non-trivial and intelligible question. Note that the explanatory problem arguably affects *dualist* frameworks as well: positing phenomenal properties as fundamental is not necessarily explanatory per se with respect to the relation between conscious states and neural states.⁴⁴

Although grounding is supposed to be an explanatory relation, the kind of psycho-physical grounding connections that Schaffer invokes appear arbitrary in a similar sense, as they seem to admit further request for explanation. Simply positing that pain obtains in virtue of the obtaining of the firing of C-fibres does not seem sufficient to make the connection between pain and its neural substrate epistemically transparent.⁴⁵ In particular, Schaffer provides two examples of these substantive grounding principles. One example consists of a function that models the inheritance of mass from the atoms to the molecule. Basically, it provides the information that mass is additive. The other example concerns the link between the intensity of the firing of C-fibres and the intensity of pain. Such a bridge principle provides the information that the intensity of pain can be determined by adding the intensities of the firing of the C-fibres. Consider this last bridge principle. For one, it looks like the kind of law empirically inferred from observed correlation that is arguably compatible with mere nomological necessitation (and hence, with anti-materialist views). For another, positing that such a correlation obtains in virtue of a grounding relation does not seem to make the psycho-physical connection at issue any less opaque. The a posteriori establishment that an instance of pain has a certain intensity in virtue of the fact that the firing of C-fibres has a certain intensity does not seem to explain why having C-fibres firing should feel that way (or like anything at all) in the first place.

⁴³ Type-identity theorists claim that conscious states are identical to physical states, although their phenomenal descriptions and their physical descriptions are not a priori connected. However, as Levine (1983) writes, “the identification of the qualitative side of pain with C-fiber firing (or some property of C-fiber firing) leaves the connection between it and what we identify it with completely mysterious” (p. 357).

⁴⁴ See Dempsey (2013).

⁴⁵ Schaffer acknowledges there is need for further work in order to specify the content of the dependence functions in play. But that seems to be the core of the problem at issue: it is hard to figure how a grounding connection would have to run in order to be explanatory with respect to the EG problem.

These kinds of bridge laws seem to assume precisely what needs to be derived and explained if we are to close the explanatory gap and solve the hard problem of consciousness.⁴⁶

We might thus concede that *metaphysical* questions can be answered by means of grounding principles (i.e. that the metaphysical gaps can be bridged). But once metaphysical issues are established, a further question (what I have called the EG question) appears to remain unanswered in the psycho-physical case. There is no corresponding unanswered question in Schaffer's examples. This should undermine Schaffer's claim that there is no special explanatory gap occurring in the psycho-physical case; even if we accept Schaffer's a posteriori Ground Physicalism, the original explanatory gap remains open.⁴⁷

In the next section, I further detail my contention that Schaffer's grounding principles cannot bridge the psycho-physical *explanatory* gap. I also address Schaffer's analogy between the zombie scenario and what he calls a dead world, which is at the core of his argumentative strategy in support of Ground Physicalism. Such discussion should clarify my claim that Schaffer's Ground Physicalism cannot provide an answer to all questions arising with respect to the psycho-physical connection. Lastly, I briefly consider Schaffer's approach to Jackson's Knowledge Argument as a further example of the difference between metaphysical gaps and the psycho-physical explanatory gap.

4. Ground Physicalism and Zombies

4.1 Grounding and the Zombie Scenario

Schaffer makes two relevant claims. First, he claims that Ground Physicalism requires zombies to be metaphysically impossible. Drawing an analogy to what he calls a dead world, he argues that a zombie world is merely conceptually (but not metaphysically) possible. Second, he claims that Ground Physicalism provides the substantive metaphysical principles needed to bridge all of the gaps between the more and less fundamental, including the gap between brain states and phenomenal states. In what follows, I aim to show that both claims can be refuted. I argue that the analogy between the dead world and the zombie scenario is inaccurate, and that Schaffer's grounding principles leave a residual gap in the psycho-physical case (I have already partially dealt with this issue in the previous sections, but in what follows I will further elaborate on it).

⁴⁶ Schaffer only provides examples of principles of property inheritance (which should determine what the properties of a derivative entity are) without providing any example of metaphysical bridge principles concerning the *existence* of the entity in question. It is hard to figure what such existence principles would look like.

⁴⁷ Note that I do not mean to claim there is no other connection in which an explanatory gap occurs. I merely claim that such a gap does not occur in *every* concrete connection.

As Schaffer states, arguments from the conceivability of a zombie scenario have been used to claim that physicalism is false. Yet no analogous scenario is said to be conceivable for chemistry or biology. He writes:

I claim that there is no such contrast. Let a dead world be a scenario that is a perfect microphysical duplicate of actuality but devoid of any biological life [...] In place of you and me, the world being imagined hosts only particles arranged in your shape and in mine [...] It would truly be nothing more than atoms in the void.⁴⁸

Schaffer claims that a microphysical duplicate of our world wherein flatworldism holds would also be a dead world (if there are no non-fundamental entities, a fortiori there are no biological organisms). Such a scenario, he argues, is conceivable given that it is conceivable that flatworldism holds at actuality.⁴⁹ If the conceivability of the zombie world entails its possibility and from its possibility we can infer that physicalism is false, the same can be done with the dead world. Schaffer then concludes that because it is hard to think biology poses a threat to physicalism, both the zombie world and the dead world are merely conceptually possible—not metaphysically possible.

When it comes to the kind of connection linking more fundamental levels to less fundamental ones, there are various scenarios that should be distinguished. Consider Schaffer's example of the connection between atoms (which we take to be fundamental, for the sake of simplicity) and molecules.

- (S0) Only fundamental entities exist. Atoms do not form chemical bonds, so there are no atoms arranged molecule-wise (or biological organism-wise).
- (S1) Only fundamental entities exist. As atoms do not mereologically compose, there are no molecules. But there can be chemical connections between atoms, which means there can be atoms arranged molecule-wise, biological organism-wise, etc.
- (S2) Non-fundamental entities exist. Atoms compose both chemically and mereologically, so molecules exist.

I believe that there are at least two ways in which we can conceive of a world that contains nothing more than atoms in the void. Both S0 and S1 correspond to this description. While S2 is clearly not compatible with a flatworld scenario, both S0 and S1 are flat since their ontology includes only

⁴⁸ Schaffer (2017, p. 17).

⁴⁹ According to Schaffer, we could conceive of a dead world also from the notion of a ghostworld. This is because having certain causal powers is required to count as a biological organism.

fundamental entities. In both cases, there is no chemical level above the microphysical level. However, the nature of the issue we are addressing changes radically depending on whether we consider S0 or S1 as the relevant scenario for Schaffer's argument. This is true despite the fact that the difference between S0 and S1 is metaphysically inconsequential.

In S1, molecules do not exist in a strong ontological sense. Still, we can speak *as if* there were molecules. It is only by looking at the ontological books, as it were, that we can conclude there are no molecules. But in S0, there is nothing we could call a molecule even in a folk sense. Moreover, S0 is arguably inconceivable, as there is an a priori entailment between facts about atoms and facts about atoms arranged molecule-wise. Hence, there are reasons to think the relevant scenario for Schaffer's General Existence and Nature Gaps is the S1 (flat, hence dead) world. In the mereological case, Schaffer's gap concerns the question of whether bonded atoms are molecules. For a world (such as S0) in which there are no bonded atoms, such a question does not make sense.

Let us now consider the same threefold distinction with respect to the connection between the firing of C-fibres and pain:

- (S0') Only brain states exist and they are not accompanied by any phenomenal feel. It is not painful to have C-fibres firing.
- (S1') Only brain states exist, but the firing of C-fibres is felt in a certain way (what we ordinarily call pain).
- (S2') Experiencing pain involves the instantiation of a genuine phenomenal property.

S0' corresponds to the zombie world, in which there is no conscious experience at all: there is nothing it is like to have C-fibres firing. S1' coincides with the phenomenal nihilist scenario (in which there is no phenomenal level above the physical level), and S2' fits the realist scenario. The dead world is thus the ontological equivalent of the phenomenal nihilist scenario. As such, it cannot be considered analogous to the zombie scenario.

Schaffer's account conflates S0' with S1'. This conflation leads to the conclusion that the zombie world, whose conceivability is often taken as a proof for the falsity of physicalism, does not present significant differences from the phenomenal nihilist world. S0' and S1' do not present *ontological* differences, or differences with respect to whether consciousness figures in the ontological books. But whether consciousness exists in the zombie scenario is not a matter of metaphysical disagreement. Zombies have neither (genuine) phenomenal states, nor phenomenal states in the ordinary sense (what eliminativists take to be illusory phenomenal states). There is no

need to check the ontological books to know that phenomenal states do not occur.⁵⁰ This is also why, contrary to both the phenomenal nihilist scenario and the flatworld (hence the dead world), the zombie scenario is by definition incompatible with actuality.⁵¹ If this is right, the analogy between the dead world and the zombie scenario is flawed. As a consequence, Schaffer's conclusion that both are merely conceptually possible and not metaphysically possible is a non-sequitur. Since Ground Physicalism requires that zombies are not metaphysically possible, Schaffer needs some other argument to undermine the metaphysical possibility of the zombie world.⁵²

As to my second point, I maintain that Schaffer's General Existence and Nature Gaps are gaps between scenarios that differ *only* in a strictly metaphysical respect. These scenarios are otherwise indistinguishable. Such gaps concern a *metaphysical* dispute about whether our world corresponds to an S2 or S1 scenario. A metaphysical bridge between S1 and S2 is needed to know whether molecules (and derivative entities in general) arise from the fundamental components of reality. This is what Schaffer's Ground Physicalism is supposed to provide. Yet the *explanatory* gap between brain states and phenomenal states deals with the non-actualized possibility of our world—either S1' or S2' with respect to consciousness, but this issue is left to the ontological debate—being a zombie world (S0'). What is needed, then, is not a metaphysical bridge between S1' and S2'. Instead, we require an explanation of the fact that *there is* a way in which the firing of C-fibres is perceived (as it is in S1' and S2') as opposed to simply being free of any inner feeling (S0'). The relevant difference between the two cases consists of the fact that the physical explanation of how atoms chemically bond bridges the gap between S0 and (S1 or S2). In contrast, our current neuroscientific theories are (supposedly) unable to provide a satisfactory bridge between S0' and (S1' or S2'), leaving the connection opaque.

What Schaffer's argument shows, then, is that ontological issues are always controversial; the fact that molecules, or consciousness, obtain in the folk sense does not necessarily suffice to claim that they exist. But my contention is that Schaffer's grounding principles are not explanatory with respect to the core question of the psycho-physical explanatory gap. Establishing that the phenomenal is metaphysically grounded in the physical does not explain why there is something like the phenomenal in the first place. In this sense, Schaffer's account does not explain why our world is not

⁵⁰ Against eliminativism, as said, some claim that having the illusion of pain is not at all different from having pain. All that is needed to count as pain is to be felt as pain, and the illusion of pain and pain are alike in this respect (see Chalmers, 1996; Kripke, 1980).

⁵¹ As mentioned, some (e.g. Frankish, 2016) reject the conceivability of S0'. As specified in section 3.1, this is something that explanatory gap theorists (both materialists and anti-materialists) deny.

⁵² Note that I am not claiming that the zombie world is indeed metaphysically possible—only that Schaffer's argument fails to prove it is not metaphysically possible.

a zombie world. It does not provide any information that could make intelligible why a certain pattern of neural activity feels the way it does rather than no way at all.⁵³

4.2 The Knowledge Argument

To conclude, I briefly turn to Schaffer's approach to Jackson's Knowledge Argument. The argument shows that there is an explanatory gap between physical knowledge and phenomenal knowledge due to the fact that Mary, who knows everything about neurophysiology but has grown up in a colourless environment, still lacks the relevant information that would allow her to a priori predict what it is like to see red. The point is that Mary lacks information about what it is like to see red (in the ordinary sense), not about whether the particular feel associated with seeing red is/counts as a genuine phenomenal property.

Schaffer argues that what Mary needs in order to be able to derive what it is like to see red is a posteriori grounding principles together with phenomenal concepts. However, the point of the Knowledge Argument is precisely that Mary's complete physical information is not complete information simpliciter. In order to bridge the gap, the relevant bridge principles would have to be derivable from her neurophysiological knowledge. Some claim that materialism is a posteriori true and that, when seeing red for the first time, Mary gains new knowledge (under phenomenal concepts) of the same (physical) facts she previously knew under physical concepts. But most of those theorists grant that there is an explanatory gap due to this a priori non-derivability.⁵⁴ Moreover, even if Mary could derive that a certain kind of neural state corresponds to a certain kind of genuinely phenomenal state by means of grounding principles, it can be further argued that she would still not have any idea about *how* being in such a phenomenal state feels. So, she would gain new information when seeing red for the first time. Thus, while a posteriori grounding principles may save materialism, they arguably fail to bridge the explanatory gap.

5. Conclusion

This paper argues that the explanatory gap thesis in the psycho-physical case is best understood as referring to the lack of a priori derivability from the physical facts of what we ordinarily call conscious experience. I claim that this issue can be kept separate from the metaphysical issue of determining whether these conscious states are indeed genuine phenomenal states. Hence, I argue that, if Schaffer

⁵³ This paper only examines Schaffer's thesis. I have argued that the kinds of grounding bridge principles he invokes actually leave a residual gap in the psycho-physical case. As an anonymous referee has rightly suggested, there are other possible metaphysical solutions that I have not dealt with. These would be very interesting material for further discussion.

⁵⁴ As specified in section 3.2, Levine claims that a priori non-derivability is not the central issue. But he also holds that the a posteriori ontological reduction of phenomenal states to physical states does not make the psycho-physical connection epistemically transparent.

is right, two kinds of gaps occur in the psycho-physical case (a metaphysical and an explanatory gap). But in Schaffer's examples, only a metaphysical gap occurs. Moreover, although Schaffer might be right that grounding principles can bridge metaphysical gaps, I claim that a further gap remains in the psycho-physical case—one that cannot be bridged by such grounding principles. There is an epistemic opacity in the psycho-physical case that is independent of the ontological picture. Thus, I conclude that Ground Physicalism does not rule out the idea that there is a *special* explanatory gap occurring between the physical and the phenomenal.⁵⁵

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