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Grounding the Gaps or Bumping the Rug?

On Explanatory Gaps and Metaphysical Methodology

Abstract: *In a series of recent papers, Jonathan Schaffer (2017a,b) presents a novel framework for understanding grounding. Metaphysical laws play a central role. In addition, Schaffer argues that, contrary to what many have thought, there is no special 'explanatory gap' between consciousness and the physical world. Instead, explanatory gaps are everywhere. I draw out and criticize the methodology for metaphysics implicit in Schaffer's presentation. In addition, I argue that even if we accept Schaffer's picture, there remains a residual explanatory gap between consciousness and the physical. The residual gap does most of the same philosophical work as the original (e.g. in conceivability arguments). Schaffer has introduced a troublesome metaphysical methodology that fails to follow through on its biggest promise: to deflate the explanatory gap.*

1. Introduction

Schaffer (2017a,b) denies the existence of any special explanatory gap between the physical and conscious experience (Levine, 1983). Instead, '*explanatory gaps are everywhere*' (Schaffer, 2017b, emphasis original). There is just as much of a gap between quarks and koalas as there is between quarks and pain. The source of these explanatory gaps is our ignorance of *metaphysical laws*. Because we don't know whether nihilism, universalism, or some other theory is the truth about mereological composition, we don't know whether the quarks and

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their ilk compose anything further, such as a koala. This is the explanatory gap between quarks and koalas.

I aim to lodge three complaints against the framework developed by Schaffer (2017a,b). First, he has missed an explanatory gap between the physical and consciousness for which there is no parallel between the physical and koalas. And this is the explanatory gap philosophers were worried about all along. Second, Schaffer's picture of the relationship between grounding, physicalism, and explanatory gaps leads to bad metaphysical methodology and to the classification of certain paradigmatic dualist positions as versions of physicalism. Third, his picture is guilty of an objectionable type of parochialism about modality. Along the way, I'll draw some lessons about the nature of explanatory gaps, the metaphysics of fundamentality, and its connection to modality.

2. Explanatory and Metaphysical Gaps

Schaffer offers a tripartite structure for grounding. There are grounds, groundeds, and principles that govern grounding. These principles will be metaphysical laws. For example, a law of universal mereological composition would be one such law. Schaffer's picture of grounding closely parallels his picture of causation; he uses structural equations (Pearl, 2009; Spirtes, Glymour and Scheines, 2000) to model both. 'Explanations are backed by dependence, grounding and causation are forms of dependence, and structural equations aptly model dependence' (Schaffer, 2017b, p. 10). These models have three parts: the determiners, the determinees, and the determination structure. The determination structure is typically modelled by directed graphs in which the nodes represent determiners and determinees and the links between nodes relations of determination.[1] In the case of causation, the determiners are the causes, the determinees are the caused, and the determination structure is provided by the causal laws. In the case of ground, the determiners are the grounds, the determinees the grounded, and the determination structure is given by metaphysical laws. In the same way that it would be a mistake to include as a cause of the window's breaking the causal laws, in addition to the striking of

[1] I have switched from talk of 'dependence' to talk of 'determination'. Nothing turns on this terminological transition. It's simply more perspicuous to talk about 'determiners' determining 'determinees' than it is to talk about 'dependents' depending on 'dependees(?)'. I'm not sure which word to use here. Thus the shift in terminology.

the ball, Schaffer thinks that it would be a mistake to include, as a ground of the koala's existence, the law of universal mereological composition, in addition to the mereological simples that compose the koala. (The *law of universal mereological composition* says that, for every plurality, there is an individual they compose.)

This tripartite structure leads to a proliferation of explanatory gaps. Consider two atoms of hydrogen and one atom of oxygen, bonded in the appropriate way, and the molecule of H_2O they ground. Schaffer argues that there is an explanatory gap between the ground and the grounded even in this simple case. An explanatory gap between the grounded and its ground consists in an epistemically opaque connection between the two. Schaffer argues that, on three popular accounts of what this opacity amounts to, the grounding connection between two atoms of hydrogen and one atom of oxygen is opaque. The three accounts of opacity use the notions of conceivability, logical possibility, and *a priori* openness, respectively. Because we cannot rule out *a priori* the possibility of mereological nihilism — according to which nothing composes — it remains conceivable, logically possible, and *a priori* open that the two hydrogen and one oxygen molecule, appropriately bonded, exist, but no H_2O molecule exists.

For the most part, that sums up Schaffer's argument that the explanatory gap between the physical and consciousness is not special. One last move needs to be explained. Mereological laws are only one among many types of metaphysical laws. And mereological gaps are one among many types of explanatory gaps. In particular, mereology is a poor metaphysical tool for understanding how consciousness does or does not arise from the physical. Even if fundamental physical particles like quarks and bosons are fully metaphysically responsible for consciousness, it is implausible that they do so by being mereological parts of, for example, a red experience. We need to expand beyond the mereological case.

Schaffer argues that grounding gaps are just as common as mereological gaps. For all we can know *a priori*, it might be that *flatworldism* is true, according to which nothing grounds anything. Thus, it is *a priori* open/conceivable/logically possible that nothing grounds anything. Thus there is, in addition to an explanatory mereological gap, an explanatory grounding gap between basic microphysical ingredients and consciousness.

3. The Residual Gap

Let's suppose that Schaffer is right. There is, in some sense at least, an explanatory gap between quarks and koalas. And there is a parallel gap between quarks and consciousness. I will argue that there is an explanatory gap between quarks and consciousness for which there is no analogous gap between quarks and koalas. This residual gap has most of the same upshots as the original for debates in the metaphysics of mind. In this section, we'll understand the opacity that goes with an explanatory gap as *a priori openness*. I'll also speak of *a priori entailment*. P *a priori entails* Q iff the material conditional 'If P then Q' is knowable *a priori*. If P fails to *a priori* entail Q, then 'P and not-Q' is *a priori* open.

Perhaps philosophers have been too hasty in claiming that there is no explanatory gap between physical particles and koalas. Or that there is *a priori* entailment between the fundamental facts about physical particles and the koala facts. If we can't come to know *a priori* that mereological nihilism is false, or that flatworldism is false, then, for all one can tell *a priori*, the fundamental physical facts might hold in a world that is completely koala-less.

But there is another fact about koalas that is *a priori* entailed by the fundamental physical facts, and is not left *a priori* open: that there are 'particles arranged koala-wise'. The locution 'arranged x-wise' is familiar from the literature on mereological composition (van Inwagen, 1990; Merricks, 2001). It is the key to making mereological nihilism compatible, at least in some sense, with common sense and simple observation. Mereological nihilism entails that there are no mereological composites, and thus no cars, coffees, or koalas. But the existence of these creatures is endorsed by both common sense and everyday observation. Mereological nihilists are quick to point out that, while their view is incompatible with the existence of koalas, it is compatible with the existence of (mereological) 'atoms arranged koala-wise'. And, they add, 'one cannot tell simply by looking that statues exist, for the visual sensations most of us attribute to statues could just as easily be caused by mere simples arranged statuewise' (Sider, 2007, p. 254).

If an idealized reasoner knew every fundamental fact, including particle positions, they would plausibly be in a position to know that those particles were arranged koala-wise. There would be no explanatory gap, or metaphysical mystery, of how a world that had fundamental particles arranged thus and so would also be a world that

contained particles arranged koala-wise. It is not *a priori* open that a world could contain fundamental particles arrange thus and so but not contain particles arranged koala-wise. If there were ever a case without an explanatory gap, this is it.

The case is quite different with consciousness. Even if an idealized reasoner knew the complete position of every particle, it's both plausible and widely argued (Chalmers, 1996) that they would not be in a position to know that there were particles 'arranged consciousness-wise'. Thus we have a residual explanatory gap between physical fundamentalia and consciousness, for which there is no analogous gap for cars, coffees, and koalas. We have identified a type of explanatory gap that, *contra* Schaffer, does not occur everywhere.

A lacuna must be addressed. It might be objected that the residual explanatory gap I've described results from using mereological composition as the mode for understanding how fundamentalia generate consciousness. Mereological composition is a poor tool for this job. Using a screwdriver to pound nails yields flawed results. I am inclined to agree with the objection. I said above that mereological composition is ill-suited for understanding how consciousness arises from underlying phenomena. We are obliged to use a more appropriate tool. I suggest ground. However, this shift does not alter the dialectic. The same basic points can be made.

Consider flatworldism, the thesis that nothing grounds anything (Bennett, 2011, p. 211). Like mereological nihilism, flatworldism is a minimalist thesis (flatworldism is just nihilism about ground). Like the mereological nihilist, the flatworldist needs a flatworldistically-acceptable locution for describing phenomena others would call 'grounded' and for avoiding clashes with common sense and everyday observation, both of which endorse the existence of grounded entities. Let's use 'laid-out-as-if'. In the same way that mereological nihilists deny the existence of koalas but accept atoms arranged koala-wise, flatworldists deny that fundamental facts ground the existence of koalas but accept that certain fundamental facts are *laid-out-as-if* koalas exist. For particles to be arranged koala-wise is to be arranged such that, if there were the type of mereological relations that permit koalas, there would be koalas. For fundamental facts to be laid-out-as-if koalas exist is for the fundamental facts to be such that, if flatworldism (i.e. grounding nihilism) were false and there were the type of grounding relations that permit koalas, koalas would exist.

We're now in a position to re-cash the residual explanatory gap between the physical and consciousness in terms of ground rather than mereology.

Schaffer may be correct that, because one cannot rule out flat-worldism *a priori*, it remains *a priori* open that a world that had a specified physical layout could fail to contain either koalas or consciousness. But a residual explanatory gap remains. It is not *a priori* open that a world that had that physical layout could fail to be laid-out-as-if there were koalas. But it is *a priori* open that a world that had that physical layout could fail to laid-out-as-if there were conscious experiences.[2]

The residual gap has most of the same ramifications in the metaphysics of mind as the original. (If they in fact are even different. I have my doubts (Section 6).) Consider conceivability arguments. The conceivability of A and not-B requires an explanatory gap between A and B. I've argued that there is an explanatory gap between the facts about physical fundamentalia and the fact that those fundamentalia are laid-out-as-if there is consciousness. If so, then it will be conceivable that P and not-C, where P is a complete description of the physical fundamentalia, and C says 'there is consciousness'. The conceived scenario is, basically, the zombie world. And there is no analogous conceivable scenario for koalas or H_2O. Once we bring to bear principles connecting (i) conceivability to possibility and (ii) the possibility of zombies to the truth of physicalism, we have a conceivability argument against physicalism. And, importantly, there is

[2] The reader might be rightly worried whether it is so obvious that there is an *a priori* route from the fundamental to the fact that the world is laid-out-as-if there are koalas or to the fact that particles are arranged koala-wise (Elder, 2007). Whether there is *a priori* entailment from the fundamental to the non-fundamental, or whether *a priori* conceivability is a guide to metaphysical possibility, is an important and substantive question without an obvious answer (for an affirmative answer, *cf.* Chalmers, 2012; Chalmers and Jackson, 2001; for a negative answer, *cf.* Block and Stalnaker, 1999). This paper assumes that we are in a dialectical context where we at least take very seriously the idea that there is *a priori* entailment from fundamental physics to facts about cars, coffees, and koalas. That is the only dialectical context in which Schaffer's arguments make sense and have the potential to move the needle. If we were already sceptical about the existence of *a priori* entailment, or about the use of conceivability as a guide to metaphysical possibility, then Schaffer's introduction of worries about *recherché* metaphysical principles are moot, or at best add an esoteric drop of fuel to a pre-existing blaze of doubts about cars and coffees. If instead we already had high credence in the *a priori* entailment of car-, coffee-, and koala-facts, or in the use of conceivability as a guide to possibility, then Schaffer's arguments could cause a genuine ruckus. (Thanks to two anonymous referees for pressing this issue.)

no analogous argument for the possibility of H_2O-zombies (or, more accurately: 'particles laid-out-as-if H_2O' or 'atoms arranged H_2O-wise' zombies).

4. Methodological Madness

My second complaint is that Schaffer's approach leads to troublesome philosophical methodology. I worry that it leads to a metaphysics according to which anything goes, and that it classifies some classical dualist positions as physicalist.

Schaffer paints a picture on which ground involves a tripartite structure of grounds, groundeds, and metaphysical laws that govern grounding. That which is neither a metaphysical law nor grounded is fundamental. Physicalism is the claim that all the fundamentals are physical. I myself am sympathetic with this construal of physicalism (Rabin, forthcoming). But I'm worried about the inflated role that the metaphysical laws play in Schaffer's system. On Schaffer's picture, the laws of metaphysics, like the laws of nature, are, in a certain sense, contingent.[3] There are worlds at which mereological nihilism is true, and others at which universalism is true. Neither thesis can be ruled out *a priori*. The laws are thus *epistemically contingent*. What other possibilities for metaphysical laws are there? Consider *peanutism*, according to which the actual world's fundamental level consists of Peanie the peanut, who resides in a pile of mould at the back of my pantry. Peanutists claim that the properties of Peanie ground the world's rich array of non-fundamentalia: cars, coffees, koalas, and all the rest. 'This makes no sense', you say. A peanut is incapable of grounding the complex configurations of, for example, a koala. There is no intelligible connection between the state of Peanie and the state of a koala. On Schaffer's methodology, there need not be any intelligible connection between the grounds and the grounded. The intelligibility of the connection will come when we introduce the metaphysical laws. The metaphysical laws, in combination with the grounds, will deductively entail the grounded.

[3] Matters are a bit delicate here. The laws of metaphysics are contingent only 'in a certain sense'. Schaffer defines the metaphysically possible worlds as the set of worlds that have the same laws of metaphysics as the actual world. Thus, trivially, non-actual laws of metaphysics are metaphysically impossible. But Schaffer recognizes a large space of worlds — the conceptually possible worlds — which do admit of different metaphysical laws. Amongst this space of worlds, the metaphysical laws are contingent.

Let's suppose that there is a metaphysical law that stipulates that Peanie-configuration *abc* leads to koala-configuration *def* and Peanie-configuration *uvw* leads to koala-configuration *xyz*. If so, then the peanutist is right: the fundamental is composed of Peanie the peanut. I prefer a methodology for metaphysics that lets us laugh the peanutist out of the room, and spend our time evaluating serious theories of the fundamental, such as physicalism, dualism, panpsychism, or structuralism. But if we're liberal about what can be a metaphysical law, and/or liberal about what the possibilities for the actual metaphysical laws are, then we are forced to allow peanutism as a genuine contender. We're left wandering aimlessly without metaphysical compass.

Schaffer does seem to let in some wild metaphysical theses as legitimate contenders. He considers the possibility that, even if mereological universalism is true, which guarantees that the two hydrogen molecules and the oxygen molecule do compose something, 'it remains opaque *what they compose*… that fusion could be a cabbage' (2017b, p. 7). (I'm inclined to think that, in the same way that one could deduce *a priori* that if the molecules are arranged thus and so then there are particles arranged H_2O-wise, one can also deduce *a priori* that those particles are not arranged cabbage-wise.)

I do not think this criticism is fatal to Schaffer's picture. He offers a picture on which the connection between grounds and grounded is opaque, and on which metaphysical laws play an important third role. But he does not say much more than this. Much could be said about what can and can't be a metaphysical law and how we determine what the metaphysical laws of the actual world are. Perhaps the lesson is that there is an important research project lurking here. I invite others to sort out the details, and deal with the worries I've raised. The worry does indeed lurk. Schaffer has opened the door for the crazies, including the peanutists and the cabbage zealots. I'd like to see a screening procedure. Not everyone deserves to be let in.

5. Modal Mayhem

Schaffer stipulates that the metaphysically possible worlds are all the worlds that have the same metaphysical laws as the actual world. That's just what Schaffer means by 'metaphysically possible/necessary'. This enables Schaffer's ground physicalism to declare zombies metaphysically impossible, and to, at least at first glance, get the modal commitments of physicalism right (*ibid.*, p. 17). A zombie

world would require metaphysical laws different than the actual laws. But Schaffer acknowledges a space of worlds wider than the metaphysically possible, which he calls 'logically possible worlds'. And Schaffer admits that zombie worlds are logically possible.

Here's the worry. What everybody else means by 'metaphysically possible world' is what Schaffer means by 'logically possible world'. And thus Schaffer is actually a dualist in physicalist clothing, at least by customary lights. Perhaps the customary lights are wrong, and Schaffer's conception of metaphysical modality is somehow preferable to other conceptions, or more suited to the debate between physicalists and dualists. But we'd need an argument to that effect. Dorr (2007) argues against the style of characterization of metaphysical modality that Schaffer prefers: 'A notion of necessity that allowed for such necessary truths would seem uncomfortably like nothing more than an extra-strong variety of nomological necessity. But when something strikes us as impossible… we don't just think of it as ruled out by a "law of metaphysics"' (p. 53).

A related worry concerns how Schaffer will classify certain positions. Consider *law dualism*, according which there are fundamental laws that relate physical or functional states with phenomenal states. 'Whenever a system is in computational state C, that system has a red experience' might be such a law. Such laws have been called 'psycho-physical' because they connect psychological states to physical states. Law dualism is the brand of dualism favoured by David Chalmers in *The Conscious Mind* (Chalmers, 1996, chapter 4, p. 127).

The most natural way to interpret the psycho-physical laws posited by law dualism is as being on a par with other fundamental laws of nature, such as the law of universal gravitation, or the laws that govern the evolution of the Schrödinger equation. But what if the psycho-physical law is a metaphysical law instead? Then, on Schaffer's categorization, law dualism is a form of physicalism. On his approach, physicalism does not require that the metaphysical laws that link grounds to the grounded be physical. Only the grounds need be physical. Law dualism satisfies the requirement. I have no idea how to gauge what will count as a metaphysical law versus a natural law on Schaffer's system. Perhaps this is a desiderata: psycho-physical laws should count as natural laws.

A third 'physicalist' position deserves consideration. The law dualist takes some psycho-physical laws to be fundamental. Because the psycho-physical laws can vary from (metaphysically possible)

world to world, this leads to the failure of metaphysical supervenience of the mental and to the metaphysical possibility of zombies. Thus dualism. Now imagine the proponent of *wolf physicalism*, who puts a physicalist spin on law dualism via linguistic trickery. They stipulate that by 'metaphysically possible world' they mean a world that has the same laws, metaphysical and/or natural, as the actual world. According to wolf physicalism, zombies are metaphysically impossible, and the mental metaphysically supervenes on the physical. (Wolf physicalism derives its name from its status as a proverbial 'wolf in sheep's clothing'. It is dualism dressed up as physicalism.)

We have three theories. All agree that there are three modal spaces of increasing size, all related by the subset relation. All three agree on exactly which worlds are where. The only disagreement concerns which of these spaces to call 'the metaphysically possible worlds'. And as long as we connect the truth of physicalism to the metaphysical possibility of zombies and the like, the truth of physicalism will turn on who is right about which set of worlds is *the* metaphysically possible world. Perhaps there is no fact of the matter which of these views is correct about 'the metaphysically possible worlds'. I am sympathetic to this thought. But that issue may be beside the point. The more appropriate question concerns which set of worlds is relevant to deciding between physicalism and dualism. If we take as given that physicalism is incompatible with the possibility of zombies, then we can ask: 'What sense of possibility?' The answer is 'metaphysical possibility', of course. But that's not much help here, because the issue under dispute is exactly which set of worlds are the metaphysically possible. Instead, we should ask about the importance of the set of worlds chosen as the preferred set by the classical dualist, the Schafferian ground physicalist, and the wolf physicalist. If any of these classes of worlds is somehow privileged or preferred, on objective, theoretical, or dialectial grounds, that would be reason to prefer one formulation over another.

I'll suggest three ways one might decide the issue. First, we might think about the ways that modality has typically been employed in the physicalism–dualism debate. Doing so mitigates taking the wolf physicalist seriously. Traditionally, the space of worlds preferred by the wolf physicalists for characterizing physicalism has been thought to be inappropriate. The mere nomological impossibility of zombies is insufficient for physicalism. Second, we should ask whether one of these spaces of worlds is objectively privileged. Some lines across modal space cut across more natural, or objectively better, divisions

than others. Unfortunately, none of the three spaces described a completely gerry-mandered set of worlds. The worlds in each space are similar to each other in a certain respect (in natural laws, metaphysical laws, and in being a world at all). There remains room to drive a wedge here. Not all respects of similarity are on a par (Armstrong, 1978; Dorr and Hawthorne, 2013; Lewis, 1986; 1983; Sider, 2012). These issues will turn, at least in part, on one's metaphysics of possibilia. Modal realism will lead to different results than will various ersatzists views (Lewis, 1986).[4] I leave this task to others. Third, both the Schafferian ground physicalist and the wolf physicalist are guilty of a parochial view about modality. They give the actual world special treatment. All three theorists agree on the existence and nature of the worlds. Consider a perspective from outside all the worlds. Is there anything objectively special about the actual world? Not really. We just happen to be located there. Both Schaffer and the wolf physicalist claim that what makes a world metaphysically possible is a certain similarity to the actual world. But there is nothing metaphysically special about the actual world. Thus, both claims about the extent of metaphysical possibility are objectionably parochial. Fourth, the characterization offered by both the Schafferian ground physicalist and the wolf physicalist will violate features of the theoretical/conceptual role of metaphysical modality. This is Dorr's complaint (2007, p. 12). Furthermore, neither view vindicates the claim that metaphysical possibility is 'possibility in the broadest sense', a supposed platitude of modal metaphysics.

6. Conclusion

Jonathan Schaffer deserves much credit for attempting to formulate more carefully exactly what an explanatory gap amounts to and where they occur. He may be correct that physicalists have been too quick to assume that there is an obvious *a priori* entailment from the existence of the H, H, and O molecules to the existence of an H_2O molecule. Mereological nihilism might be true. But I'm not sure that even this much follows. Philosophers need to speak and write in some way. It's more convenient to speak of molecules and koalas than to speak of simples arranged molecule- and koala-wise. So philosophers tend to speak, for convenience's sake, as if mereological nihilism were false.

4 Thanks are due to Jonathan Simon here.

They shouldn't be faulted. In most contexts, nothing turns on this terminological choice, and the relevant debate can be rephrased in nihilistically acceptable vocabulary. (Similar remarks hold true for nominalism about properties. Platonistically acceptable langauge is more perspicuous. So philosophers use it. In doing so they are rarely taking any stand on the platonism vs. nominalism debate.) This is such a case. We can recapture the relevant explanatory gap — the 'special' gap between the physical and consciousness — in nihilistically acceptable vocabulary. Or in flatworldistically acceptable vocabulary. *Contra* Schaffer, the move to an alternative tripartite picture has not revealed that the gap between the physical and consciousness is not special. And he has ventured into treacherous methodological territory. I would not put it past him to convince us all that this dangerous territory offers rich philosophical bounty. There is a worthwhile research project here. I leave it to Schaffer and his disciples to fight off the peanutists and cabbage zealots and reap the rewards.

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