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A PANPSYCHIST DEAD END

Abstract: Panpsychism has received much attention in the philosophy of mind in recent years. So-called constitutive Russellian panpsychism, in particular, is considered by many the most promising panpsychist approach to the hard problem of consciousness. In this paper, however, I develop a new challenge to this approach. I argue that the three elements of constitutive Russellian panpsychism—i.e. the constitutive element, the Russellian element and the panpsychist element—jointly entail a ‘cognitive dead end’. That is, even if constitutive Russellian panpsychism is true we cannot ascertain how it might solve the hard problem of consciousness.

I

Introduction. Panpsychism was once dismissed as a highly counterintuitive, if not absurd, view. Karl Popper, for example, said that the view was based on an assumption that is ‘either trivial and completely verbal, or grossly misleading’ (Popper and Eccles 1977, p. 69). Wittgenstein wrote, ‘Could one imagine a stone’s having consciousness? And if anyone can do so—why should that not merely prove that such image-mongery is of no interest to us?’ (Wittgenstein 1953/2009, p. 126). More recently, in criticising David Chalmers’s version of panpsychism, John Searle wrote that it is a ‘breathtakingly implausible’ view that has ‘the extra absurd consequences of trying to combine’ functionalism and property dualism, which he finds untenable (Searle 1997, p. 152).

Over the last twenty years, however, panpsychism has been revived as a novel solution to the hard problem of consciousness. Many leading philosophers of mind, such as David Chalmers (2013, 2017), Philip Goff (2017a, 2017b), William Seager (2017), and Galen Strawson (2008), have devised careful arguments for the view and attracted many supporters to it. After a lengthy absence of books focusing specifically on panpsychism, many have been published recently (Blamauer 2011, Brüntrup and Jaskolla 2017, Clark 2003, 2004, Mathews 2003, Skirbina 2005, Seager 2019). It is no exaggeration to say that panpsychism is now considered a serious alternative to the dominant materialist approach to consciousness.

Constitutive Russellian panpsychism is arguably the most promising contemporary version of panpsychism. According to this view, not only micromaterial objects, such as human brains, but also micromaterial objects, such as subatomic particles, yield phenomenal

properties. Moreover, this view says that microphenomenal properties (phenomenal properties of micromaterial objects) constitute macrophenomenal properties (phenomenal properties of macromaterial objects) and that microphenomenal properties represent the intrinsic natures of micromaterial objects. In this paper, I contribute to the debate over the tenability of constitutive Russellian panpsychism by proposing the following thesis: Constitutive Russellian panpsychism reaches a ‘cognitive dead end’. That is, even if constitutive Russellian panpsychism is true we cannot know how it might solve the hard problem of consciousness. My cognitive dead end thesis seems to me to be straightforward and obvious but, as far as I know, it has been overlooked by both proponents and opponents of constitutive Russellian panpsychism.

As the debate over constitutive Russellian panpsychism becomes more and more complex we tend to forget our initial motivation to consider the view. In the first half of this paper, therefore, I look at constitutive Russellian panpsychism with fresh eyes by considering it from scratch. As its name suggests, constitutive Russellian panpsychism consists of three elements: the constitutive element, the Russellian element and the panpsychist element. I show how we can reach constitutive Russellian panpsychism from a common-sense view of reality in three steps, each of which corresponds to one of the three elements. I then explain how the three steps entail the cognitive dead-end thesis.

This paper has the following structure. In Section II I discuss the first step towards constitutive Russellian panpsychism, focusing on the *panpsychist* element of the view, and explain how we can move from the common-sense view to *panpsychism*. In Section III I discuss the second step, which focuses on the *constitutive* element, and explain how we can move from panpsychism in general to *constitutive* panpsychism. In Section IV I discuss the third step, which focuses on the *Russellian* element, and explain how we can move from constitutive panpsychism in general to constitutive *Russellian* panpsychism. I then argue in Section V that the first step entails what I call the ‘ingredient problem’ while the second and third steps jointly entail what I call the ‘process problem’. I then explain how these problems lead us to the cognitive dead end, which precludes us from demonstrating the truth of constitutive Russellian panpsychism as a solution to the hard problem of consciousness. In the final section, I apply parallel reasoning to constitutive Russellian *cosmopsychism* to show that this view also reaches a cognitive dead end.

II

From a Common-Sense View to Panpsychism. Imagine a vast conceptual space that represents reality. Divide this space horizontally into two levels, the macro level, on the upper side, and the micro level, on the lower side, and place all macro entities, such as tables, chairs, clouds, people and planets as well as their properties, on the macro level and all micro entities, such as subatomic particles as well as their properties, on the micro level. The distinction between the micro level and the macro level can be illustrated as follows (Figure 1).

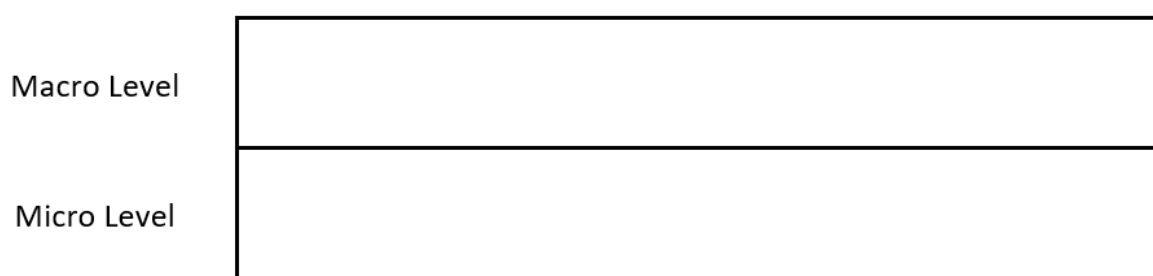


Figure 1. Macro level vs. micro level

As Barbara Montero points out, reality can be stratified into levels in many distinct ways, such as decomposition, supervenience, realisation, explanation, reduction, determination, and so on (Montero 2006, p. 181). In what follows, I consider ontological levels organized by constitution because that is most relevant to *constitutive* Russellian panpsychism. I assume that entities on the macro level are constituted by entities on the micro level, which means that entities on the micro level are ontologically prior to entities on the macro level. We also assume that the constitutive relationship is a partial order: reflexive, antisymmetric, and transitive. We discuss constitution further in Sections III and V.

Some further preliminaries are in order. First, it is worth noting that both the macro and micro levels can be further divided into sublevels. For instance, there can be a higher macro sublevel on which there is a car and its properties and a lower macro sublevel on which there are parts of that car and their properties. We can however set this point aside and focus only on the two main levels, the macro and micro levels, because sublevels play no role in my argument. Second, the distinction between macro entities and micro entities is vague so, inevitably, there are borderline cases in which it is difficult to ascertain if a given entity should be placed on the macro level or the micro level. Again, we can set such a concern aside because it is not directly relevant to my argument. Third, by the term ‘entity’ I mean either an object or a property of an

object. One might dispute the distinction between an object and a property but such a dispute does not affect my argument either. As we proceed with the discussion, our primary focus will be on properties, phenomenal properties in particular. Fourth, it is assumed here, for the sake of simplicity, that reality is not ‘gunky’. That is, we reject the thesis that any whole has further proper constituents. We assume that there are entities that are not constituted by further entities. Such entities occupy the lowest, most fundamental sublevel of the micro level.¹

Now suppose we divide reality vertically into two regions: the material region, on the left side, and the phenomenal region, on the right side. We place all material entities in the material region and all phenomenal entities in the phenomenal region. Knowing exactly which entities count as material and which entities count as phenomenal is not particularly crucial here. The conceptual space representing reality has now been divided into four regions: (i) the material region on the macro level (the upper left side), (ii) the phenomenal region on the macro level (upper right side), (iii) the material region on the micro level (the lower left side), and (iv) the phenomenal region on the micro level (lower right side). The distinctions between the macro level and the micro level and between the material region and the phenomenal region can be illustrated as follows (Figure 2).

	Material Region	Phenomenal Region
Macro Level	(i)	(ii)
Micro Level	(iii)	(iv)

Figure 2. Macro level vs. micro level and material region vs. phenomenal region

The common-sense view of reality, which is most widely accepted among philosophers and laypeople, can be presented as follows: On the macro level, there are both material entities and phenomenal entities. That is, there are entities in regions (i) and (ii). At least some

¹ For discussions of the mind–body problem and the possibility of infinite constitution or decomposition see Montero (2006) and Nagasawa (2012).

macromaterial entities, such as the brains of humans and other sentient animals, yield phenomenal properties, that is, macrophenomenal properties. On the micro level, however, there are only material entities. That is, there are entities in region (iii) but not in region (iv). Micromaterial entities, such as subatomic particles, do not yield phenomenal properties. That is, there are no such things as microphenomenal properties. Macromaterial entities are constituted by micromaterial entities but macrophenomenal entities are not constituted by anything. The common-sense view of reality can be illustrated as follows (Figure 3).

	Material Region	Phenomenal Region
Macro Level	Micromaterial Properties	Macrophenomenal properties
Micro Level	Micromaterial Properties	

Figure 3. The common-sense view

The common-sense view can be developed into materialism or dualism depending on how we understand the relationship between the material region and the phenomenal region. If we assume that the material region and the phenomenal region are ontologically distinct then the common-sense view entails dualism. If, however, we assume, roughly speaking, that the phenomenal region ultimately collapses into the material region then the common-sense view entails materialism.

Panpsychism is in agreement with the common-sense view about what exists on the macro level: there are both macromaterial entities and macrophenomenal entities. Yet it disagrees with the common-sense view about what exists on the micro level: not only are there micromaterial entities but there are also microphenomenal entities. This means that panpsychism is obtained from the common-sense view by extending phenomenality to the micro level.² Panpsychism can be illustrated as follows (Figure 4).

² Panpsychists tend to be vague about the prevalence of phenomenal properties on the macro level. Some seem to think that all macromaterial entities (as well as all micromaterial entities)

	Material Region	Phenomenal Region
Macro Level	Macromaterial Properties	Macrophenomenal properties
Micro Level	Micromaterial Properties	Microphenomenal Properties

Figure 4. Panpsychism

Why should we accept panpsychism rather than the common-sense view? We might do so to preserve the continuity and homogeneity of reality. The common-sense view implies that consciousness came into existence only in a small region of the universe at a specific time in history. This would give us an inelegant and uneven picture of the universe. On the other hand, panpsychism entails a more elegant and uniform view that consciousness is a common feature of the universe that is spread throughout space and time. The same point can be made in reference to evolution. In *On the Origin of Species* Charles Darwin famously said:

If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down. But I can find out no such case. (Darwin 1859/1998, p. 154)

Darwin's claim here is presented in terms of complex organs but it can be presented in terms of any complex natural properties. If, as the common-sense view suggests, phenomenal properties are present only in specific macro objects that occur in nature, such as the brain, which came into existence relatively recently in the history of the universe, then it is difficult to explain how these full-fledged phenomenal properties could have arisen through the process of evolution, which can, as Darwin says, involve only numerous, successive, slight modifications.

have phenomenal properties while others seem to think, like proponents of the common-sense view, that only some specific macromaterial entities, such as the brains of humans and other sentient animals, have phenomenal properties. I assume the former for the sake of simplicity but this choice does not affect my overall argument.

In summary, panpsychism can be obtained from the common-sense view of reality by extending the presence of phenomenal properties to the micro level. In this way, panpsychism can maintain the ontological continuity and homogeneity of reality.

III

From Panpsychism to Constitutive Panpsychism. We can now move on to the second step in our analysis, which takes us from panpsychism to *constitutive* panpsychism. Panpsychists normally agree with the common-sense view that micromaterial entities constitute macromaterial entities. Subatomic particles constitute atoms, which constitute molecules, which constitute brain cells, which constitute the brain, and so on. Given the assumption that constitution is transitive we can skip the intermediate relationships and hold that micromaterial entities like subatomic particles constitute macromaterial entities like the brain. Some assert related points by saying that macromaterial entities are wholly or partly grounded in micromaterial entities, or that macromaterial truths obtain in virtue of micromaterial truths.

Constitutive panpsychism makes a parallel claim about phenomenal properties: microphenomenal entities constitute macrophenomenal entities. For example, the phenomenal properties of subatomic particles constitute phenomenal properties of larger particles, which constitute phenomenal properties of atoms, which constitute phenomenal properties of molecules, which constitute phenomenal properties of brain cells, which constitute full-fledged phenomenal properties realised in the brain. If we skip the intermediate relationships we can hold that the phenomenal properties of subatomic particles constitute full-fledged phenomenal properties realised in the brain. Some assert related points by saying that macrophenomenal properties are wholly or partly grounded in microphenomenal properties, or that macrophenomenal truths obtain in virtue of microphenomenal truths. The following figure illustrates constitutive panpsychism (Figure 5).

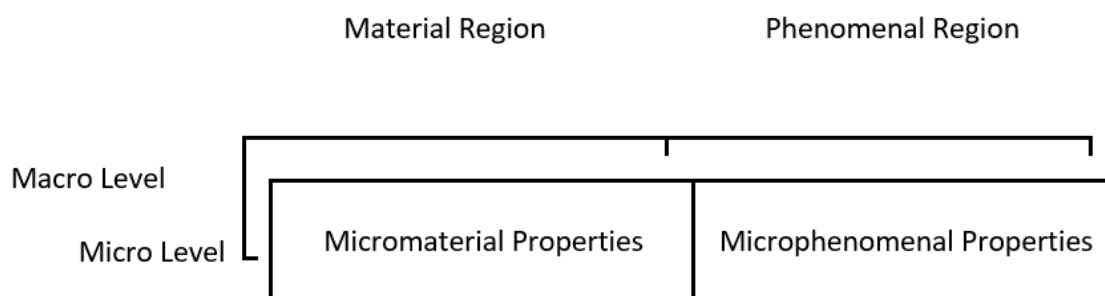


Figure 5. Constitutive panpsychism

Why should we accept constitutive panpsychism rather than panpsychism per se? There are many reasons but I mention two here. First, by accepting constitutive panpsychism we can avoid the multiplication of the hard problem of consciousness. Panpsychism per se is not committed to a specific relationship between macrophenomenal properties and microphenomenal properties. It could hold, for example, that there is no ontological priority between macrophenomenal properties and microphenomenal properties. If so, the hard problem of consciousness, which is concerned with the relationship between the material and the phenomenal, multiplies. Recall that the common-sense view attributes phenomenal properties only to (specific) macromaterial entities like the brain. This means that the hard problem of consciousness arises for the common-sense view only on the macro level. Panpsychism, on the other hand, expands consciousness by attributing it to both macromaterial and micromaterial entities. This means that the hard problem of consciousness arises for panpsychism not only on the macro level but also on the micro level (as well as their sublevels). This looks bad given that philosophers have struggled to solve the hard problem of consciousness on the macro level alone. Constitutive panpsychism can be considered an attempt to address the multiplication of the hard problem by hypothesising the constitutive relationship between microphenomenal properties and macrophenomenal properties. If constitutive panpsychism is true, then we need to address the hard problem only on the micro level. Once the hard problem is taken care of on the micro level it is automatically taken care of on the macro level as well because, according to constitutive panpsychism, microphenomenal properties are ontologically prior to macrophenomenal properties.

Another reason to move from panpsychism to constitutive panpsychism is that it avoids the unwelcome possibility of strong emergence. If panpsychism is true but constitutivism is false, then we can appeal only to (macro or micro) *material* properties to explain how the brain can yield macrophenomenal properties. But the realisation of phenomenal properties solely by material properties seems to be an instance of strong emergence, which violates the following principle:

For any feature *Y* of anything that is correctly considered to be emergent from *X*, there must be something about *X* and *X* alone in virtue of which *Y* emerges, and which is sufficient for *Y*. (Strawson 2008, pp. 64–65)

It seems impossible to obtain something wholly phenomenal (e.g. a macrophenomenal property) from something wholly material (e.g. a macromaterial or micromaterial property). As Galen Strawson remarks, the instantiation of phenomenal properties by wholly non-phenomenal properties seems to be as extraordinary as, for example, the instantiation of spatial properties by non-spatial properties. Strong emergence is ‘by definition, a miracle every time it occurs’ (Strawson 2008, pp. 64–65). Constitutive panpsychism avoids the problem of strong emergence on the macro level by hypothesising that macrophenomenal properties are constituted by microphenomenal properties. Strong emergence is not required here because macrophenomenal properties and microphenomenal properties are both phenomenal properties.

One might point out here that while we have explained how the micro level and the macro level are related we have not explained how the material region and the phenomenal region are related. To address this concern, we must move on to the third step, the Russellian step, which takes us from constitutive panpsychism to constitutive Russellian panpsychism.

IV

From Constitutive Panpsychism to Constitutive Russellian Panpsychism. Starting with the common-sense view, we have reached constitutive panpsychism in two steps. The first step has taken us from the common-sense view of reality to panpsychism by extending the presence of consciousness to the micro level. This step has allowed us to maintain the continuity and homogeneity of reality. The second step has taken us from panpsychism to constitutive panpsychism by hypothesising that macrophenomenal properties are constituted by microphenomenal properties. This step has allowed us to avoid the multiplication of the hard problem of consciousness and the possibility of strong emergence. The third, and final, step will take us from constitutive panpsychism to constitutive *Russellian* panpsychism. This step is based on a move commonly made by Russellian monists. As I wrote with Torin Alter, Russellian monism consists primarily of the following three theses:

Structuralism about physics: the basic properties physics describes are structural/relational properties.

Realism about inscrutables: there are inscrutables, the natures of which are not wholly structural or relational.³

(Proto)phenomenal foundationalism: at least some inscrutables are either phenomenal or protophenomenal properties. (Alter and Nagasawa 2015b, p. 425)

Incorporating these theses into constitutive panpsychism, constitutive Russellian panpsychism can be presented as the view consisting of the following two theses:

- (a) Microphenomenal properties constitute macrophenomenal properties.
- (b) Microphenomenal properties are inscrutables, which cannot be fully described by physics because their natures are not wholly structural or relational.

Thesis (a) corresponds to the panpsychist and constitutive elements of constitutive Russellian panpsychism and thesis (b) corresponds to the Russellian element. Following Chalmers, we can present the set consisting of (a) and (b) more simply as follows: “microphenomenal properties serve as quiddities and also constitute macrophenomenal properties” (Chalmers 2017, p. 181). The figure below illustrates constitutive Russellian panpsychism (Figure 6).

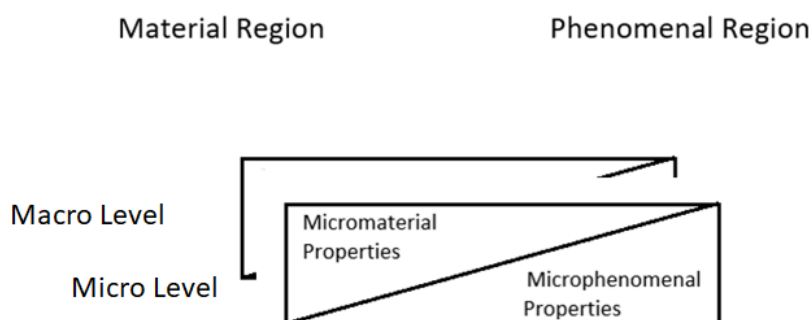


Figure 6. Constitutive Russellian panpsychism

What is the benefit of incorporating Russellianism into constitutive panpsychism? As we have seen, constitutive panpsychism avoids the multiplication of the hard problem of consciousness by hypothesising that macrophenomenal properties are constituted by

³ The term ‘inscrutables’ was introduced by Barbara Montero (2015).

microphenomenal properties. It does not, however, eradicate the hard problem altogether as the following question remains: How do micromaterial entities realise microphenomenal properties? In other words, while constitutive panpsychism eliminates the hard problem of *macro* consciousness by appealing to the constitutive relationship between macrophenomenal properties and microphenomenal properties, it leaves the hard problem of *micro* consciousness unresolved. The Russellian twist allows us to eliminate the hard problem of micro consciousness by hypothesising that microphenomenal properties not only constitute macrophenomenal properties but also represent quiddities of micromaterial entities (rather than something that is fundamentally distinct from micromaterial entities). This move allows us to avoid dualism and maintain monism. Constitutive panpsychism per se is not necessarily a version of monism; it is compatible with dualism. However, constitutive *Russellian* panpsychism *is* a version of monism, which seems more elegant and parsimonious.⁴

There is an additional bonus for taking the second (constitutive) step and the third (Russellian) step towards constitutive Russellian panpsychism. As Chalmers notes, constitutivism allows us to say that macrophenomenal properties are causally efficacious in virtue of being grounded in microphenomenal properties, and Russellianism allows us to say that microphenomenal properties are causally efficacious in virtue of their playing fundamental micromaterial roles (Chalmers 2013). This means that the second and third steps jointly entail a possible solution to the problem of mental causation, another intractable problem in the philosophy of mind.

V

Panpsychist Dead End. Constitutive Russellian panpsychism is known to face the combination problem. The combination problem arises from the apparent discrepancy between highly complex, structured aggregates of microphenomenal properties, on the one hand, and smooth, uniform macrophenomenal properties, on the other. The problem suggests that constitutive Russellian panpsychism is false because macrophenomenal properties do not seem to be aggregates of any smaller phenomenal properties. According to Chalmers, there are at least three distinct versions of the combination problem: The *quality* combination problem, which is concerned with how microphenomenal qualities combine to yield macrophenomenal

⁴ Some argue that Russellianism entails dualism rather than monism but I set this debate aside in this paper. See, for example, Chalmers (2002), p. 265.

qualities; the *subject* combination problem, which is concerned with how microsubjects combine to yield macrosubjects; and the *structure* combination problem, which is concerned with how microphenomenal structures combine to yield macrophenomenal structures (Chalmers 2017, pp. 182–184). Since my argument applies equally to all three versions I present the problem as a general problem of explaining how microphenomenal properties combine to yield macrophenomenal properties.

A successful solution to the combination problem must be able to explain the process through which macrophenomenal properties obtain from microphenomenal properties. This means that to solve the problem the following three questions must be answered:

- (1) What are microphenomenal properties?
- (2) What are macrophenomenal properties?
- (3) How can an aggregate of microphenomenal properties yield macrophenomenal properties?

The following diagram illustrates these questions (Figure 7).

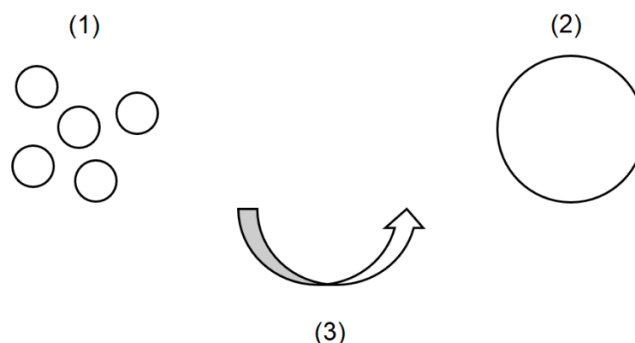


Figure 7. Three questions concerning the process through which macrophenomenal properties obtain from microphenomenal properties

We do not have a problem with question (2). We know very well what (at least some) macrophenomenal properties are because we grasp them transparently. In fact, there is nothing more directly accessible than our own phenomenal properties. I argue, however, that we face a cognitive dead end because it is cognitively impossible for us to answer questions (1) and (3). This is analogous to a situation in which we fail to explain how a certain dish is cooked. A

cooking recipe consists primarily of descriptions of the following three items: (i) ingredients, (ii) the dish and (iii) the cooking process. In our context, while we do know very well what the dish (macrophenomenal properties) is we cannot identify the ingredients (microphenomenal properties) or describe the cooking process (how an aggregate of microphenomenal properties yields macrophenomenal properties). Even worse, as I explain below, the dish and the cooking process have strange characteristics; the dish does not appear to consist of any ingredients at all and the cooking process is supposed to be fundamentally different from any other known cooking process.

In what follows, I defend my cognitive dead-end thesis by returning to the three steps we can take to derive constitutive Russellian panpsychism. I argue that the first step, which takes us from the common-sense view of reality to panpsychism, creates the ‘ingredient problem’, showing that question (1) cannot be answered. I then argue that the second step, which takes us from panpsychism to constitutive panpsychism, and the third step, which takes us from constitutive panpsychism to constitutive Russellian panpsychism, jointly entail the ‘process problem’, showing that question (3) cannot be answered. I then argue that the ingredient problem and the process problem are intertwined because we cannot answer question (1) without having already answered question (3) and we cannot answer question (3) without having already answered question (1). In other words, we face a Catch-22 situation. I conclude that the ingredient problem and the process problem entail a cognitive dead end for constitutive Russellian panpsychism.

The Ingredient Problem

The ingredient problem arises from the first step, which takes us from the common-sense view of reality to panpsychism. This step allows us to maintain the ontological continuity and elegance of nature by extending consciousness to the micro level. However, it also raises question (1): What are microphenomenal properties?

Panpsychists have expended considerable effort attempting to answer question (3), which asks how an aggregate of microphenomenal properties can yield macrophenomenal properties.⁵ To answer this question, however, we have to answer question (1) first. Appealing to the cooking analogy again, to find out what the cooking process is we have to know first what the ingredients are (as well as what the dish is). This might not be the case if it is possible

⁵ See, for example, Chalmers (2017), Coleman (2012, 2014, 2017), Goff (2006, 2017b) and Seager (2012, 2017).

to determine from identifying the dish what the ingredients are. Reverse engineering is sometimes possible. That concept does not apply to macrophenomenal properties, however because, as the combination problem shows, they are unusual properties which do not appear to be constituted by any smaller components.

Thomas Nagel (1974) famously challenges materialism by appealing to our apparent incapacity to understand what it is like to be a bat. Given that we do not share a bat's unique sensory apparatus, sonar, we cannot even imagine what it is like to have phenomenal experiences that a bat enjoys. Yet, even if we can never know the phenomenal properties associated with a bat's experience of using sonar we can still know or at least imagine phenomenal properties associated with a bat's experience of using more familiar sensory apparatuses, such as eyes and ears. After all, humans and bats are sentient animals resulting from evolution situated near to one another on the phylogenetic tree. We know nothing, though, about any phenomenal properties associated with the experiences of micromaterial objects. Micromaterial objects have no sensory apparatuses so obviously they do not have conscious experiences in the same way that we do; their experiences must be much more primitive than ours. They also lack neural systems, so they do not have phenomenal experiences that are linked to neural activity. We do not have a transparent grasp of microphenomenal properties and we cannot even imagine what microphenomenal properties are like.

Constitutive Russellian panpsychists might try to avoid the ingredient problem by appealing to the concept of *protophenomenal* properties. Chalmers writes:

There are two ways this might go. Perhaps we might take [phenomenal] experience itself as a fundamental feature of the world, alongside space-time, spin, charge and the like. That is, certain phenomenal properties will have to be taken as *basic* properties. Alternatively, perhaps there is some *other* class of novel fundamental properties from which phenomenal properties are derived. . . . [T]hese cannot be material properties, but perhaps they are nonmaterial properties of a new variety, on which phenomenal properties are logically supervenient. Such properties would be related to experience in the same way that basic material properties are related to nonbasic properties such as [the] temperature [of a gas]. We could call these properties *protophenomenal* properties, as they are not themselves phenomenal but together they can yield the phenomenal. (Chalmers 1996, pp. 126-127)

The second option that Chalmers proposes in the above passage can be seen as an approach to the ingredient problem. According to this approach, the ingredient problem does not arise

because there is no such thing as ‘what it is like to be micro objects’. Micro objects are not conscious but only *protoconscious*, so they do not have full-fledged phenomenal properties like us. This approach successfully avoids question (2) above, but it achieves this success merely by replacing microphenomenal properties with protophenomenal properties, which seem to be more elusive, if not more obscure, than microphenomenal properties.

Protophenomenal properties are by definition neither phenomenal nor material properties. All we know is that they comprise another class of fundamental properties from which phenomenal properties are derived. Chalmers writes, ‘Of course it is very hard to imagine what protophenomenal properties could be like, but we cannot rule out the possibility that they exist’ (Chalmers 1996, p. 127). I agree with Chalmers that we cannot rule out such a possibility; my point here is not that protophenomenal properties do not exist. My point is rather that replacing microphenomenal properties with protophenomenal properties does not help us solve the ingredient problem because it is no easier to discover what protophenomenal properties are than it is to discover what microphenomenal properties are. We know the nature of at least a certain type of phenomenal property, namely that of our own macrophenomenal properties. We know almost nothing, however, about the nature of protophenomenal properties or microphenomenal properties.

The above observation suggests that, in one sense, constitutive Russellian panpsychism is in a worse position than traditional materialism or dualism. Traditional materialism and dualism deny the existence of protophenomenal properties or microphenomenal properties and focus on explaining the relationship between macrophenomenal properties and (micro or macro) material properties. This means that they do not face the ingredient problem. They might struggle to provide a satisfactory explanation of the relationship but, unlike constitutive Russellian panpsychism, at least they do not have to explain protophenomenal properties or microphenomenal properties, about which we know nothing.

Given that we do not have a transparent grasp of microphenomenal properties the only way to learn what they are seems to be to infer such knowledge from macrophenomenal properties, with which we are familiar, and what we know about the process of producing macrophenomenal properties from microphenomenal properties. Analogously, if we do not have a good grasp of the ingredients of a dish the only way to learn what they are seems to be to infer such knowledge from the dish, with which we are familiar, and what we know about the cooking process. In what follows, however, I argue that we cannot know how such a process works.

The Process Problem

The ingredient problem that we have discussed above arises through the first step towards constitutive Russellian panpsychism, the step that corresponds to the panpsychist element of constitutive Russellian panpsychism. This step extends phenomenality not only to the macro level but to the micro level as well. What I call the ‘process problem’ arises through the second and third steps, which correspond to the constitutive element and the Russellian element of constitutive Russellian panpsychism, respectively. As we saw earlier, these steps are based on the ideas that (a) microphenomenal properties constitute macrophenomenal properties (constitutivism) and (b) phenomenal properties are inscrutables, which cannot be fully described by physics because they are not wholly structural or relational (Russellianism).

Notice now that there is an apparent inconsistency between constitutivism and Russellianism. On the one hand, constitutivism says that microphenomenal properties constitute macrophenomenal properties. That is, there is a structural and relational link between microphenomenal properties and macrophenomenal properties. On the other hand, however, Russellianism implies that phenomenal properties are not wholly structural or relational. How could we pursue constitutive Russellian panpsychism if constitutivism requires structure and relation while Russellianism precludes them? One might respond to this question by arguing as follows: We can reinterpret Russellianism as a thesis that precludes structure and relation for *microphenomenal* properties, which are most fundamental, but not necessarily for *macrophenomenal* properties, which are less fundamental. Hence, according to this response, constitutive Russellian panpsychists can consistently claim that while microphenomenal properties are not a matter of structure and relation macrophenomenal properties *are* a matter of structure and relation; they are structured aggregates of microphenomenal properties.

I suggest that this response fails because the very lesson of the combination problem is that even macrophenomenal properties cannot be structured aggregates of smaller entities. This point is perhaps most vividly illustrated in the following passage by William James:

Take a hundred of them [feelings], shuffle them and pack them as close together as you can (whatever that might mean); still each remains the same feeling it always was, shut in its own skin, windowless, ignorant of what the other feelings are and mean. There would be a hundred-and-first feeling there, if, when a group or series of such feelings were set up, a consciousness *belonging to the group as such* should emerge. And this 101st feeling would be a totally new fact; the 100 original feelings might, by a curious material law, be a signal for its *creation*, when they came together; but they would have no substantial identity with it, nor it with them, and one could never deduce the one

from the others, or (in any intelligible sense) say that they *evolved* it (James 1890/1950, p. 160, original emphasis).

James's thought experiment implies that phenomenal properties, whether they are micro or macro, are not structured aggregates of smaller phenomenal properties. No matter how we arrange smaller phenomenal properties we cannot obtain larger phenomenal properties.

Notice, however, that in the above quote James encourages us to 'shuffle [phenomenal properties] and pack them as close together' as possible to see that no aggregate of them can yield larger phenomenal properties. This suggests that James presupposes that when phenomenal properties form a structure they are arranged in a causal or spatiotemporal manner, in the same way that ordinary material entities are normally arranged. In physics structures of higher-order material entities are typically described in terms of how more basic material entities, which form the structures, interact causally in space and time. James seems to assume that structures of macrophenomenal properties should be described in the same way. One might try to refute James's reasoning here by objecting to these presuppositions. One might claim that the structural or relational link that microphenomenal properties have with macrophenomenal properties is a unique one which is neither causal nor spatiotemporal. In other words, according to this response, we should not interpret Russellianism as the view that phenomenal properties are not a matter of structure or relation *simpliciter*; we should interpret it rather as the view that they are not a matter of structure or relation in a causal or spatiotemporal sense. But what sort of structural or relational link could macrophenomenal properties and microphenomenal properties have if the link is neither causal nor spatiotemporal?

Constitutive Russellian panpsychists can countenance a structural relationship only if it is (i) constitutive (because it is a requirement of constitutivism), (ii) not strongly emergent (because constitutivism is based on a rejection of strong emergence) and (iii) neither causal nor spatiotemporal (because it is excluded by the combination problem and the above interpretation of Russellianism).

Philip Goff (2017b) hypothesises a non-emergent, non-causal, non-spatiotemporal relationship called 'phenomenal bonding' as a possible relationship in which microphenomenal properties bond to constitute macrophenomenal properties.⁶ Chalmers says that Russellianism

⁶ Goff (2017b) presents the hypothesis of phenomenal bonding in terms of phenomenal subjects but in this paper I present it in terms of phenomenal properties to make it consist with the focus of our discussion.

is compatible with this hypothesis. Russellianism holds that fundamental monadic properties like mass and charge can have monadic quiddities underlying them as their categorical bases. The most likely candidates for such quiddities are phenomenal or protophenomenal properties. Similarly, according to Chalmers, Russellianism can hold that fundamental monadic *relations*, like spatiotemporal relationships, can have relational quiddities underlying them as their categorical bases. The most likely candidate for representing such relational quiddities appears to be phenomenal bonding or something similar to it (Chalmers 2017, p. 200).

If, as Chalmers says, phenomenal bonding represents relational quiddities underlying monadic relational properties, then we do not have a transparent grasp of such relationships. Goff says, however, that this does not mean that we cannot form a conception of phenomenal bonding; ‘we may even be able to identify it with some relation we can observe in the world or some relation that features in physics’ (Goff 2017b, p., 293). For example, Goff says, in the same way that panpsychists might identify charge with a form of consciousness proponents of phenomenal bonding might identify some empirically known relationship as the phenomenal bonding relationship. However, it seems to me to be extraordinary to identify charge *itself* with a form of consciousness even if it is reasonable to consider consciousness to be comparable to charge. Similarly, it seems to me to be extraordinary to identify empirically known relationships, such as causation, *themselves* with forms of phenomenal bonding even if it is reasonable to consider phenomenal bonding to be comparable to empirically known relationships.

Goff might still be right in thinking that phenomenal bonding is indeed the relationship that holds between microphenomenal properties and macrophenomenal properties. I maintain, however, that our cognitive limitations prevent us from understanding the nature of such a relationship in a meaningful sense. Phenomenal bonding is supposed to be a unique and unfamiliar relationship that allows microphenomenal properties to bond in a non-causal, non-spatiotemporal manner to yield macrophenomenal properties. To grasp such a relationship we would have to grasp both microphenomenal properties and macrophenomenal properties. As we have seen above, however, the ingredient problem shows that we cannot grasp microphenomenal properties. Using the cooking analogy again, this is comparable to a situation in which we have to determine what the cooking process (phenomenal bonding) is when we do not know what the ingredients (microphenomenal properties) are; we know only what the dish (macrophenomenal properties) is. Moreover, we understand that this cooking process is fundamentally different from any other cooking processes with which we are familiar. At this point, one might claim that we can determine what the cooking process is by analysing the

meal, with which we are familiar. However, ironically, such reverse engineering is impossible because here the meal has an unusual characteristic insofar as it does not seem to consist of any ingredients at all. Goff nevertheless writes:

Just because we are unable to form a transparent conception of the phenomenal bonding relation does not mean we cannot form a conception of it. We can think of it as ‘the property such that when subjects stand in it they constitute a further subject’ and we can suppose that there is such a thing. (Goff 2017b, p. 293)

He continues:

I can see no principled reason to think the phenomenal bonding relation is not a real relation that certain subjects bear to each other, and I think therefore we have a way of making sense of subjects summing, and hence a way of making sense of panpsychism. The theoretical attractions of panpsychism give us good reason to take this route to saving the view, and hence to believe that there is a phenomenal bonding relation. (Goff 2017b, p. 293)

Goff may be right that there is good *theoretical* reason to consider phenomenal bonding relationships as possible relationships between microphenomenal properties and macrophenomenal properties, but his thesis that phenomenal bonding is ‘the property such that when subjects stand in it they constitute a further subject’ is not particularly informative. We cannot infer or even speculate from this thesis how microphenomenal properties may aggregate to yield macrophenomenal properties. It is illuminative that after some substantial discussion of phenomenal bonding relationships Chalmers writes, “The biggest question for any phenomenal bonding view is as follows: What is the phenomenal bonding relation?” (Chalmers 2017, p. 200). Of course, phenomenal bonding is not the only option for those who seek non-causal, non-spatiotemporal relationships between macrophenomenal properties and microphenomenal properties. Yet whichever alternatives we consider face a dead end as they cannot avoid the ingredient problem or the process problem.

VI

Conclusion. Let us summarise what we have learned about the cognitive dead end. Again, to establish constitutive Russellian panpsychism we have to be able to answer the following three questions:

- (1) What are microphenomenal properties?

- (2) What are macrophenomenal properties?
- (3) How can an aggregate of microphenomenal properties yield macrophenomenal properties?

We know the answer to question (2) because we, as macrophenomenal subjects, have a transparent grasp of what (at least some) macrophenomenal properties are. But we cannot know the answer to question (1). This is the ingredient problem caused by the panpsychist element of constitutive Russellian panpsychism. The only way to know the answer to question (1) is either to have a transparent grasp of microphenomenal properties or to infer what they are from the answers to questions (2) and (3). The first option is not available because we, as macrophenomenal subjects, do not have a transparent grasp of microphenomenal properties.

Answering question (3), which is required to infer the answer to question (1) from the answer to question (2), is also impossible. This is the process problem caused by the constitutive element and the Russellian element of constitutive Russellian panpsychism. The only way to know the answer to question (3) is to infer it from the answers to questions (1) and (2) because, given Russellianism, constitutivism and the combination problem, the relationship between macrophenomenal properties and microphenomenal properties cannot be a familiar type of relationship such as a causal or spatiotemporal relationship. Again, however, we cannot know the answer to question (1) without first knowing the answer to question (3).⁷ Hence, again, we are in a Catch-22 situation: To discover what microphenomenal properties are we have to know first how microphenomenal properties can aggregate to yield macrophenomenal properties. Yet to know how microphenomenal properties can aggregate to yield macrophenomenal properties we have to know first what microphenomenal properties are.

What we face is comparable to a situation where we have to specify function $f(x) = y$ given that we know only what y (a macrophenomenal property) is. To determine what $f(x)$ (how an aggregate of microphenomenal properties yield macrophenomenal properties) is we have to know first what x (a microphenomenal property) is. Ironically, though, to infer what x is from y we have to know first what $f(x)$ is.

⁷ An additional difficulty is that if we somehow acquire a transparent grasp of microphenomenal properties we are likely to lose our transparent grasp of macrophenomenal properties because achieving the former requires us to be microphenomenal subjects and achieving the latter requires us to be macrophenomenal subjects. We do not seem to be able to be microphenomenal subjects and macrophenomenal subjects at the same time.

Our focus has been on constitutive Russellian panpsychism but the same reasoning applies to constitutive Russellian *cosmopsychism* as well. Cosmopsychism has attracted much attention in the recent literature because, according to its proponents, it retains some advantages of panpsychism while avoiding its shortcomings.⁸ According to constitutive Russellian cosmopsychism, the cosmos is, contrary to common sense, conscious and its phenomenal properties—cosmophenomenal properties—are fundamental phenomenal properties occupying the highest level, the cosmic level, which is above the macro level that macrophenomenal properties occupy. Macrophenomenal properties are, according to this view, segments of cosmophenomenal properties. Constitutive Russellian cosmopsychism, which considers the cosmic level to be the most fundamental level, is a mirror image of constitutive Russellian panpsychism, which considers the micro level to be the most fundamental level. To establish constitutive Russellian cosmopsychism we have to answer the following three questions:

- (1') What are cosmophenomenal properties?
- (2) What are macrophenomenal properties?
- (3') How can segments of cosmophenomenal properties yield macrophenomenal properties?

As we saw above, we know the answer to question (2), but we cannot know the answer to question (1'). We can know that answer only if either we have a transparent grasp of cosmophenomenal properties or we infer it from the answers to questions (2) and (3'). The first option is not available because we, as macrophenomenal subjects, do not have a transparent grasp of cosmophenomenal properties. The second option is not available either because to know the answer to question (3') we have to know the answer to (1') first. The only way to know the answer to question (3') is to infer it from the answers to questions (1') and (2) because, given Russellianism, constitutivism and the combination (or de-combination) problem, the relationship between cosmophenomenal properties and macrophenomenal properties cannot be a familiar type of relationship such as a causal or spatiotemporal relationship. However, again, we cannot know the answer to question (1') without first knowing the answer to question (3'). In summary, we are in a Catch-22 situation again: To discover what cosmophenomenal properties are we have to know first how cosmophenomenal properties can be segmented to

⁸ For recent discussions of cosmopsychism see Albahari (2019), Goff (2017a), Jaskolla and Beck (2012), Matthews (2011), Miller (2018), Nagasawa and Wager (2017), Nagasawa (2019) and Shani (2015).

yield macrophenomenal properties. Yet to know how cosmophenomenal properties can be segmented to yield macrophenomenal properties we have to know first what cosmophenomenal properties are. Hence, constitutive Russellian cosmopsychism faces a problem that is parallel to the problem that constitutive Russellian panpsychism faces.

Constitutive Russellian cosmopsychism considers macrophenomenal properties to be *segments* (of more fundamental cosmophenomenal properties) rather than *aggregates* (of less fundamental microphenomenal properties). One might argue that this places constitutive Russellian cosmopsychism in a better position than constitutive Russellian panpsychism because segmenting an object is distinct from building an object, and only the latter of the two seems to be structural. I do not find this argument persuasive. Structuring an object does not always involve aggregation. A structure is a system in which entities are arranged or organised in a certain way and entities can be arranged or organised by reduction or subtraction as well as aggregation or addition. Segmenting cosmophenomenal properties to yield macrophenomenal properties is a matter of structure and relation as much as aggregating microphenomenal properties to yield macrophenomenal properties is.

I do not mean that what I have argued shows that constitutive Russellian panpsychism (or cosmopsychism) is clearly false. I can see how some might regard it as making conceptual progress towards solving the hard problem of consciousness by overcoming the limitations of materialism. It might indeed be possible to show through theoretical considerations *that* microphenomenal properties can aggregate to yield macrophenomenal properties (or *that* cosmophenomenal properties can be segmented to yield macrophenomenal properties). As I have argued, though, constitutive Russellian panpsychism (or constitutive Russellian cosmopsychism) seems caught in a deadlock: we are cognitively unable to show *how* microphenomenal properties can aggregate to yield macrophenomenal properties (or *how* cosmophenomenal properties can be segmented to yield macrophenomenal properties). Hence, even if it is true, constitutive Russellian panpsychism (and constitutive Russellian cosmopsychism) cannot be a truly satisfying solution to the hard problem of consciousness.

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