Hyperdimensional Neutral Monism: A Dimensional Approach to the Mind-Body Problem

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AFFIDAVIT

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ABSTRACT

Abstract: This thesis explores various responses to the mind body problem, including physicalism, panpsychism, idealism and neutral monism. I argue that none of these theories successfully resolves the mind-body problem in their current formulations. I therefore introduce the concept of 'hyperdimensional neutral monism' as an elaboration and exploration of neutral monism. Neutral monism states that there is a single type of neutral, ontologically primary ultimate, which both the physical and the mental supervene on (Banks, 2010). Hyperdimensional neutral monism (HNM) states that these ultimates exist in a more-than-4-dimensional realm and that the physical world of spacetime is a 4-dimensional aspect of this realm. Consciousness is the protrusion of spacetime into more than four dimensions. In order to explain these concepts, I utilize an aquatic metaphor of vortices appearing within a physical ocean. I compare HNM to panqualityism, which is another version of neutral monism (Coleman, 2014, 2016), and cosmopsychism (Shani, 2015, 2018) which relies on a similar aquatic metaphor. I argue that HNM is a viable means of addressing the mind-body problem and the hard problem of consciousness (Chalmers, 1996, 2015, 2017, 2019).

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Introduction

In this Master's dissertation I explore various approaches to addressing the mind-body problem and ultimately introduce and defend a novel response, which I call 'hyperdimensional neutral monism'. The mind body-problem is the problem of defining the relationship between mind and body. The problem specifically concerns the relationship between the brain (or body) and consciousness (or the mind). However, it can also concern the broader nature of reality and the relationship between consciousness and the entire physical universe.[1]

The mind-body problem goes beyond that of defining the neural correlates of consciousness. With the expanding field of neuroimaging, we are gaining increasingly detailed knowledge on which parts of the brain *correspond* to which conscious experiences, but we are no closer to understanding *why* a physical object such as the brain corresponds to conscious experience at all (Robinson, 2020). We could imagine an entity which is *physically* identical to us down to each individual atom, but which is *experientially* different from us, or even experientially non-existent, as in the case of 'philosophical zombies', which I discuss below (Chalmers, 1996). As such, the knowledge that a specific neuron corresponds to a specific experience does not help answer the question of why there is experience in the first place.

This dissertation is divided into four main chapters. In Chapter 1, I broadly explore the mind-body problem (Chalmers, 1996, 2017b, 2019; Robinson, 2020) and the dualist response to this problem (Robinson, 2020; Lycan, 2003). In Chapter 2, I broadly explore monist responses to the mind-body problem, including physicalism (Lycan, 2003; Carrol, 2017; Chalmers, 1996, 2017b), panpsychism (Goff, 2015, Strawson, 2017, Chalmers, 2015, 2017a), idealism (Chalmers, 2019, 2017a; Downing, 2011; Kastrup, 2014 ;Shani, 2015), and neutral monism (Banks, 2010, 2014; Stubenberg, 2016; Coleman, 2016, 2017). In Chapter 3, I narrowly focus on panqualityism (Coleman, 2012, 2014, 2016, 2017; Coleman & Goff, 2020) and cosmopsychism (Shani, 2015; Shani & Keppler, 2018; Kastrup, 2014, 2017a-c; 2018) in order to lay the foundations for the introduction of hyperdimensional neutral monism (Frenkel, 2022), which I explain in Chapter 4.

Briefly, HNM concurs with neutral monism in general, that there is a single type of neutral, ontologically primary ultimate, which both the physical and the mental supervene on. HNM

[1] Specifically within various forms of philosophical idealism, whereby physical reality is understood to supervene on mental reality, as well as neutral monism, whereby both physical and mental reality are understood to supervene on neutral fundamental elements.

expands on this understanding by stating that these types of neutral ultimates exist in a more-than-4-dimensional realm and that the physical world of spacetime is a 4-dimensional aspect of this realm. Consciousness is the protrusion of spacetime into more than four dimensions. In order to explain these concepts, I utilize an aquatic metaphor of vortices appearing within a physical ocean (Frenkel, 2022). Before introducing HNM, I review existing dualist and monist responses to the mind-body problem.

Broadly speaking, substance dualism, which I discuss in Chapter 1.2, is the theory that mind and body are separate types of substances (hence *substance* dualism, which must be differentiated from *property* dualism, which I discuss below). Substance dualism has the advantage that the mind and body are not reducible to each other as they are simply different types of fundamental *thing*. As such, it does not need to derive mind from matter nor matter from mind (Robinson, 2020). However, it suffers from the problem of causal interaction between the mental and the physical. If mind and matter are different types of substances, how can they possibly interact with each other? (ibid). And if the physical universe is causally closed, as is suggested by modern physics, then how could the mental possibly have causal efficacy in the physical world? (ibid).

In Chapter 2, I discuss various monist responses to the mind body problem. I start with physicalism (Chapter 2.1), which is the current dominant paradigm within both science and philosophy. According to physicalism, there is only one type of fundamental substance, and it is physical. In contrast to dualism, physicalism is a type-monist view as it posits only one type of fundamental stuff[2]. Physicalism does not face the problem of causal interaction as both mind and matter are reducible to the physical. However, it does face the problem of the 'explanatory gap' (Chalmers, 1996), which is the problem of how the mental can possibly be reducible to the physical. Chalmers introduces the concept of 'philosophical zombies' to illustrate this point. These zombies are physically identical to us and act exactly as we do, but they have absolutely no inner experiential existence. As these zombies are conceivable, according to Hume's conceivability principle, they must also be possible (ibid). As two identical physical systems can conceivably correspond to different mental systems (including the absence of mentality), the mental cannot supervene upon the physical.

[2] I discuss the difference between type-monism (or type-pluralism) and token-monism (or token pluralism) below.

In response to the explanatory gap, panpsychists (Chapter 2.2) argue that the mental is an internal, categorical property of physical matter. Some Panpsychists (such as Strawson) agree with physicalists that the physical is the only type of fundamental stuff in the universe[3], but they argue that all (or at least some) physical matter has an element of mind to it. And if matter has an element of mind to it, then there is no explanatory gap between the physical and the mental. Mentality does not need to *emerge* from the physical, nor is it identical to the physical. Rather, mentality is a categorical property of the physical at the fundamental level (Goff & Coleman, 2020; Chalmers, 2015, 2019).

The biggest problem for panpsychism is the 'combination problem'. The combination problem is that of how the consciousnesses of individual fundamental entities (be they micro-entities or a single fundamental cosmic entity) could possibly combine (or de-combine in the case of cosmopsychism) to create human level consciousness (Chalmers, 2017a). Consciousness can be likened to a specific point of view, but points of views are seemingly not combinable (Goff, 2006; Coleman; 2014). I discuss various aspects of the combination problem, including the subject combination problem, the quality combination problem, and the structure combination problem, as well as various panpsychist responses to the problems.

Another alternative theory, which claims to be free from the hard problem and the various combination problems is philosophical idealism, which I discuss in Chapter 2.3. Idealism can be seen as the inverse of physicalism. Whereas physicalists argue that the fundamental stuff of the universe is physical, and that the mental supervenes on the physical, idealists argue that the fundamental stuff of the universe is mental, and that the physical supervenes on the mental (Chalmers, 2019).

George Berkely argued that the physical is an image in the mind of god. Given the reference to an 'image', Berkely can be categorized as an anti-realist or subjective idealist (ibid). The main problems for Berkeleyan idealists, is the relationship between veridical experience and hallucinations, and the nature of the physical world if there are no subjects observing it.

There are also a number of forms of objective idealism (in contrast to Berkeley's subjective idealism), which state that the physical world 'really', exists, but it has a surprising nature (ibid). Objective idealists face analogues of the combination (or de-combination) problem. The

[3] There are also various forms of non-physicalist panpsychism, which I discuss in subsequent chapters.

problem is that of how fundamental mental entities can combine (or de-combine) to create mental entities such as ourselves (ibid). Micro-idealism is the thesis that the fundamental ontological ground is the mentality associated with micro-fundamental matter, such as quarks, electrons, or vibrating strings. Cosmic idealism is the thesis that the fundamental ontological ground is the mentality associated with the universe as a whole.

In Chapter 2.4, I discuss the existing theory which, in conjunction with cosmopsychism, forms the basis for HNM. Neutral monists argue that there is one fundamental type of stuff, but that it is neither mental nor physical.[4] Broadly speaking, neutral monists argue that the fundamental neutral stuff organized in one manner is expressed as physical and organized in another manner is expressed as mental. Or alternatively, the physical and mental are both different types of *properties* of the neutral fundamental ground (Banks, 2010; Stubenberg, 2016). As such, Chalmers argues that *property* dualism (in contrast to *substance* dualism) is a form of neutral monism (Chalmers, 1996).

While neutral monists do not suffer from the explanatory gap faced by physicalists, they do suffer from different gaps – the gap between neutral (or non-experiential) ultimates and experience or the gap between non-subjective ultimates and subjects of experience. If the fundamental ontological ground is non-mental, then how can mentality arise from it? (Chalmers, 2019; Shani, 2021). In addition, neutral monists struggle to explain, in positive rather than negative terms, what the fundamental ontological ground actually is. Generally, neutral monists agree that the fundamental ground is neither mental nor physical, but those are negative conceptions of the ultimate. If the ground is neither mental nor physical, what exactly is it? (Stubenberg, 2016).

After broadly exploring these various monistic theories, in Chapter 3 I focus more specifically on cosmopsychism (CP), which can be classified as either panpsychist or idealist, depending on the specific form it takes, and panqualityism (PQ), which is a form of neutral monism. CP states that the universe as a whole is fundamental and that there are mental states associated with this monistic universe (Shani, 2015). This cosmic consciousness then ground macro-consciousness. PQ states that the fundamental ontological ultimates are 'unexperienced phenomenal qualities' or 'phenomenally qualitied ultimates' (Coleman, 2012). These unexperienced qualities are neither mental nor physical but are the ground for both the mental and physical. I demonstrate

[4] Alternatively, neutral monists argue that the fundamental ground is *both* mental *and* physical.

that both of these theories provide valuable insights into the mind-body problem, but that they both ultimately face critical problems. CP faces an aspect of the 'constitution problem' whereby it struggles to explain how cosmic consciousness constitutes macro-consciousness (Chalmers, 2019). PQ faces the quality/awareness gap, whereby it struggles to explain how unexperienced qualities could possibly constitute awareness (Chalmers, 2015; Shani, 2021).

Finally, in Chapter 4, I introduce hyperdimensional neutral monism. HNM concurs with neutral monism that there is a single type of neutral, ontologically primary ultimate, which both the physical and the mental supervene on (Frenkel, 2022). But it expands on this notion by utilizing the concept of *dimensionality*. I utilize one of the central notions of string theory, that the universe is more-than-4-dimensional, but I argue that the 'extra' dimensions can be reconceived as neither spatial nor temporal, but rather 'consciousal' (ibid).

I note that all previously discussed theories of mind rely on a common assumption – that consciousness is some sort of entity, substance, event or process. As such they all face one of two problems. Either they conceive of the mental and the physical as different types of substances (dualism), and therefore face the problem of causal interaction; Or they conceive of a single type of fundamental substance (which can be physical, mental, or neutral), which all entities supervene upon (monism), and therefore face various explanatory gaps. By introducing the notion of fundamental *dimensions* rather than fundamental *substances or processes*, I hope to demonstrate that there is a viable means of bridging these explanatory gaps (ibid).

Depending on the extent to which these additional fundamental dimensions successfully bridge the explanatory gaps, HNM can be seen ambitiously, as a resolution to the mind-body problem which bypasses the problems faced by all other theories, or less ambitiously, as an alternative view that is worth considering alongside existing views. Either way, I hope to demonstrate that HNM provides a meaningful contribution to the literature on the mind-body problem.

The chapter on HNM is divided into nine inter-related sections. In Chapter 4.1 – Prelude, I explain my initial thought process in applying the notion of dimensionality to consciousness. In Chapter 4.2, I provide the requisite definitions and conceptual frameworks. In Chapter 4.3 – Overview, I explain the more-than-4-dimensional relationship between neutral ultimates, the physical universe and consciousness. I then expand on the notion of dimensionality in Chapter 4.4 by explaining the difference between intrinsic and extrinsic curvature. In Chapter 4.5, I further expand on the notion of curvature and explain the relationship between extrinsic

curvature in multiple dimensions and consciousness. In Chapters 4.6 - 4.7 I explore the relationships between consciousness, the brain and life. I argue that in the context of HNM, the brain can be seen as a hypodimensional aspect (or surface) of consciousness. I then argue that the threshold for consciousness is life itself and that all living things, including single celled organisms, are conscious. In order to clarify a number of issues, I then perform a detailed comparison between HNM and CP in Chapter 4.8. I argue that HNM has greater explanatory power than CP, through its usage of dimensionality. Finally, in Chapter 4.9, I refute various criticisms of HNM.

In the conclusion, I explore possible future applications in both western and eastern philosophy as well as in art and science.

Chapter 1 – The Mind Body Problem and The Dualist Response

1.1 – The Mind-Body Problem

The mind-body problem is that of the relationship between the mind and body or the mental and the physical. It seems that we human beings have both physical and mental properties. Our bodies seem to have physical properties such as mass, temperature, size, colour, etc; But we also seem to have mental properties such as thoughts, perceptions, experience, beliefs, desires, etc. (Robinson, 2020).

These types of properties seem to be incompatible with each other for a number of reasons. For starters, there seems to be a difference regarding epistemic access. I am the only person who has access to my mental states or properties, and you are the only person who has access to your mental states or properties. Contrastingly, we all have equal access to physical states or properties. Physical properties are therefore public, while mental properties are private. Even where mental states seem to be publicly visible through behaviour, for example, where someone winces in pain, such access is indirect. We *assume* that the other person is in pain because of their behaviour, but only they have direct access to the phenomenal feeling of pain (ibid).

In this sense, the realm of science seems to be limited. It can address the behaviour of various ‘objective’ or ‘third-person’ entities but has no access to ‘subjective’ or ‘first-person’ experience.

> While the physical sciences are good at explaining system structure, function and dynamics, there appears to be no third-person route by which they can fully explain the nature of conscious experiences or what it is like to have them.… [T]he explanatory gap between conscious experiences and associated brain states will have to be crossed in a different way. (Velmans & Nagasawa, 2012, 5)

There are various aspects to the mind-body problem. The first aspect of the problem is to define what mental states and physical states are, and how they relate to each other. Are mental states nothing other than complex physical states as stated by physicalism? Or does the physical supervene on the mental as per idealism? Or are they completely separate types of substances, as per dualism?

The next aspect to the problem is the causal relationship between the mental and the physical. Do mental states or properties causally influence physical states or properties? Do physical states causally influence mental states? If so, how? If not, why do mental and physical states seem to influence each other, or at the very least, why do they seem to correspond with each other? In this question, the relationship between a specific mind and specific body becomes salient. Why does it seem that a specific mind is 'housed' in a specific body? Or why does it seem that a specific body 'belongs to' a specific mind? (Van Gulick, 2014)

Before addressing these problems, it is important to define the relevant terms – namely 'mental' and 'physical'. It is also important to note that various theories may define these terms differently, or even contest the existence of the mental or the physical. At this point, I try to use the most widely accepted philosophical definitions and clarify any discrepancies in how these terms are defined in my discussions on various theories. I also avoid defining the mental and physical in relation to each other (for example defining physical as non-mental or the mental as non-physical), as the relationship between them is the undefined relation which the mind-body problem questions. As such, any definition of mind in terms of matter or matter in terms of mind necessarily assumes the relationship which is under question, and would therefore be circular in reasoning. For example, if we were to define 'mental' as 'non-physical', we would be assuming that physicalism (specifically identity theory) is false. Identity theorists would deny that the mental is non-physical as they argue that mentality in the form of consciousness is identical to the physical brain. As such, defining 'mental' as 'non-physical' would preclude identity theorists' definition of mentality.

Mental – The notion of mentality arises from our own, first-person experience. We do not have third-person, objective access to the experiences of other subjects. As such, the primary reason to posit the existence of anything mental in the first place, is because we seem to have our own conscious mental states. According to William James, '[t]he first and foremost concrete fact which every one will affirm to belong to his inner experience is the fact that consciousness of some sort goes on' (James, 1910, 71).

We may disagree about the contents of consciousness, the way that consciousness relates to subjectivity, awareness, ipseity, etc., but we can all (mostly) agree that consciousness of some sort exists.[5] In Nagel's widely accepted definition of consciousness, he states that '…fundamentally, an organism has conscious mental states if and only if there is something that it is to be that organism—something it is like for the organism.' (Nagel, 1974, 1)

This definition refers to the conscious mental states *of an organism* and does not address conscious mental states which are prior to (or more fundamental than) an organism. However, there are various theories that posit conscious experience independent of subjects of experience:

> the Buddhist [Abhidarma] account does not accept that the usually unargued assumption that having a conscious experience necessarily entails a subject of experience, a subject for whom it is, somehow or other, like to have this experience. On this Buddhist account subjectivity is accounted for by the fact that conscious states are reflexively self-aware, they are not states of awareness in virtue of being owned or had by a subject of experience.… There are no subjects and no streams of experiences; only synchronically unified experiences. Such a denial of subjects of experience at the level of microexperiences and macroexperiences is much more radical than contemplated by Western philosophers, with the possible exception of Hume. (Chadha, 2019, 33)

Hume argues that the consciousness of an organism supervenes on the conscious mental states. As such, mental states are prior to subjects. He states:

> For my part when I enter most intimately into what I call myself, I always stumble on some particular perception or other, of heat or cold, light or shade, love or hatred, pain or pleasure. I never can catch myself at any time without a perception, and never can

[5] Eliminative materialists would, however, dispute this point. See Dennett, 1991

> observe any thing but the perception. When my perceptions are removed for any time, as by sound sleep; so long I am insensible of myself, and may truly be said not to exist. (Hume, 2003, 165)

Coleman notes that the 'what-it-is-likeness' in Nagel's definition of consciousness refers to the *content* of experience, while the 'that-it-is-for-ness' relates to that which is *aware* of the contents of experience, or the awareness aspect of the experience. According to panqualityism (PQ), the content of experience, or 'unexperienced phenomenal qualities', are universal and prior to subjects of experience (Coleman & Goff, 2020).

Given that some theories posit that the contents of consciousness are prior to subjects of experience, defining mentality in terms of a conscious organism (or a conscious subject of experience) is too narrow as it draws a foregone conclusion on the relationship in question.[6] In response to the Buddhist Abhidarma, Humean bundle theory, and PQ, I utilize Nagel's definition of a conscious organism as a base for a definition for mental, but specifically omit any reference to an organism. I therefore define mental as 'something it is like' or 'being like something'. This definition allows for a broad range of seemingly mental facts, such as consciousness, awareness, experience, subject of experience, self, thought etc. (I define these terms as required below). For example, a conscious thought is 'like something', but it may not be 'like something for the conscious thought'. We would generally say that a conscious thought is not in itself conscious, but we would generally say that it belongs in the category of mental.

Physical – The notion of physical is oddly difficult to accurately define without reference to the mental. Defining 'physical' in relation to physics is also problematic as it generally results in circular definitions whereby physical entities are described by their dispositional relationships to other physical entities (Goff, 2017). Furthermore, physics changes over time, but the notion of being physical does not necessarily change along with physics. It is also unclear where the boundaries of 'physical' are. Is a photon or an electron physical? What about a vibrating multi-dimensional string, as per string theory?

Given these issues, I utilize a modified version of Descartes' definition of 'physical' and accept that there are grey areas where the line between physical and non-physical is blurry. Descartes defined physical as that which is extended in space. By extension, he meant that which has

length, breadth, or depth (Lycan, 2003). Given Einstein's unification of space and time into spacetime, I define physical as that which is extended in spacetime.

It is worth noting that according to string theory, there are additional dimensions beyond the four dimensions of spacetime. In some versions of string theory, the extra dimensions exist *within* spacetime (possibly curled up below the planck scale) (Kaku, 2012), while in other theories (such as various brane theories), the extra dimensions are *outside of* or *contain* spacetime (ibid). The strings or branes which vibrate in these extra dimensions are generally considered to be physical, even though they are more than four dimensional (or exist in more than four-dimensional spacetime). As such, I accept that strings, branes, and the dimensions within which they vibrate are included in the definition of physical, *so long as the extra dimensions are strictly spatial or temporal*. In Chapter 4 below, I explore the possibility that other dimensions are neither spatial nor temporal, in which case, they would not be included under the definition of physical.

Having defined mental and physical, I turn to the problematic nature of the relationship between them. Given that mental is defined as 'something it is like', and the physical is defined as extension in spacetime, how can these seemingly different categories relate to each other? Why does it seem that there is a correspondence between the first-person 'what it is like-ness' and the third person extension in spacetime? Why does it seem that my first-person desire to move my arm causes the third-person, observable fact of my arm moving? And why does it seem that the third-person observable fact of someone taking a mind-altering drug causes the first-person experience of an altered state of consciousness. We are aware of physical entities which are seemingly not conscious, such as tables and clouds, so what is it about a physical brain that corresponds to consciousness?[7]

Chalmers recasts this problem as the 'hard problem of consciousness', which can be stated as follows:

> It is undeniable that some organisms are subjects of experience. But the question of how it is that these systems are subjects of experience is perplexing. Why is it that when our cognitive systems engage in visual and auditory information- processing, we have visual or auditory experience: the quality of deep blue, the sensation of middle C? How

[7] Roelofs argues that inanimate objects such as tables and clouds are, in fact, conscious and that a brain is not a pre-requisite of consciousness. I disregard this theory for the purposes of this dissertation (Roelofs, 2019)

> can we explain why there is something it's like to entertain a mental image, or to experience an emotion? It is widely agreed that experience arises from a physical basis, but we have no good explanation of why and how it so arises. Why should physical processing give rise to a rich inner life at all? It seems objectively unreasonable that it should, and yet it does. (Chalmers, 2017b, 226)

It is important to note an unquestioned assumption here. At the end of this quote, Chalmers states that physical processing 'give[s] rise to a rich inner life', but this assumes that the mental supervenes upon the physical, and therefore assumes physicalism. However, this is incidental to the hard problem. Regardless of the supervenience relation between the mental and the physical, we can state that physical processing seems to correspond with a mental inner life (and visa versa), and this correspondence is the hard problem of consciousness. The hard problem, in other words, is that of why there is any sort of mentality at all, and why the mental and physical seem to correspond with each other.[8]

Chalmers differentiates between the hard problem and the easy problems. The easy problems include problems such as the reportability of mental states, the voluntary control of behavior, or the integration of information by a cognitive system (ibid). The critical difference between the easy problems and the hard problem is that the easy problems can theoretically be explained by science. This is not to say that science can *currently* or *easily* answer all the easy problems, but we can at least understand what an answer would look like. In order to explain integration of information[9], for example, we would need to explain the mechanism by which information is brought together (ibid).

In contrast, the hard problem is related to the problem of experience. And given the boundedness of subjective experience (Miller, 2018), it is unobservable from the third person perspective and therefore inaccessible to science, which relies on shared observable facts. Given that experience is outside of the scientific domain, it is difficult to imagine what a scientific solution to the hard problem would even look like.

[8] Conversely, from an idealist perspective, whereby mentality is deemed to be fundamental, one could rather ask why there is any sort of *physicality* at all, and why the mental and physical seem to correspond with each other.

[9] As per integrated information theory (IIT) – See Tononi, 2012

The type of correspondence relation between the mental and the physical is a critical aspect of the mind-body problem. Any successful theory will need to explain what this relation is, and how the relation is achieved. Given the different definitions for physical and mental, how is it that something which is 'extended in spacetime' corresponds to something which 'is like something'.

More specifically, is the correspondence relation one of causality, supervenience or mere correspondence? And if it is a relationship of causality or supervenience, in which direction does it flow? Does consciousness supervene on the physical as asserted by physicalism? Does the physical supervene on the mental as asserted by idealism? Do both mental and physical states or properties supervene on a 'neutral' state or property as per neutral monism? And critically for all theories, *how* does this correspondence relationship work? If the brain creates consciousness (if the mental supervenes on the physical), how does it do so? Why is there something it is like to be a brain, rather than nothing?

These are the critical questions which the mind-body problem poses. In the following chapters, I explore various responses to these problems.

1.2 – The Dualist Response

Dualism is typically categorized into substance (or Cartesian) dualism and property dualism. Substance dualism is the theory that mind and matter are two separate types of ontologically fundamental substances. According to substance dualism, mind is not reducible to matter, and matter is not reducible to mind (Robinson, 2020). Property dualism, on the other hand, is the theory that mind and matter are different properties of a single ontologically primary substance. Given that property dualism posits a single kind of substance, it can be rather classified as a form of monism (Chalmers, 1996). I accept this alternative classification and therefore discuss property dualism in the section on neutral monism below. In this section, I specifically address substance dualism, which I simply refer to as 'dualism' for the remainder of this dissertation.

Descartes advocated substance dualism as a response to the mind-body problem. He held that minds are entirely distinct from physical bodies. According to this view, minds are purely spiritual entities, whereas bodies are purely physical entities. Minds have no physical properties such as size, mass or location, and are therefore entirely non-physical. Bodies have no mental

properties such as consciousness, experience, or awareness, and are therefore entirely non-mental. As such, human beings are dualities – we are both minds and bodies (ibid).

Dualism involves two interrelated concepts – the first is that of *substance*, and the second is that of *dualism* of substances. A mental substance is the entity which *has* experience. It is the *soul, spirit*, or *subject* which is at the centre of experience. As such, a mind is not just a bundle of thoughts (as Hume argues), but rather the immaterial entity, or the mental substance, which thinks. The interrelated concept of dualism of substances is that this mental substance is fundamentally different from a physical substance such as the physical body. The soul thus *inhabits* the body but is fundamentally distinct from it (ibid).

While the notion of immaterial souls is contrary to modern science (which is generally equated with physicalism, which I discuss in Chapter 2.1 below), it is arguably the most 'common sensical' view. According to Paul Bloom,

> We do not feel that we are material things, physical bodies. The notion that we are machines made of meat, as Marvin Minsky once put it, is unintuitive and unnatural. Instead, we feel as if we occupy our bodies. We possess them. We own them. Because of this, we talk about my brain, or my body, using the same language of possession that we use when we talk about my car, or my child. These are things that we possess, that we are intimately related to—but not what we are. (Bloom, 2004)

People generally feel themselves to be a separate self, which possesses a physical body. This feeling may be hard to defend within the dominant paradigm of physicalism, but it is arguably the default unexamined view.

Even upon examination, dualism has one major advantage over competing theories. Because mind and matter are two different types of substances, they do not need to reduce to each other or emerge from one another. All monist theories need to explain the ontological relationship between mind and matter. If everything is physical, how do we get minds? If everything is mental, how do we get matter? Or if everything is neutral, how do we get minds or matter? But dualism is immune to these concerns. Mind and matter are simply different fundamental types of stuff.

Unfortunately for dualism, this advantage also comes with its most pressing problem. If minds and matter are different fundamental types of stuff, how can they possibly causally interact with

each other? It seems to be the case that minds and matter do causally interact. Mental activity seems to lead to various actions including intentional bodily movement and speech. (Lycan, 2003). And physical chemical interactions between drugs and brains seems to lead to changes in mental states. But if minds are completely non-physical, how can they possibly causally interact with physical objects in space? What could this mechanism of interaction even look like?

This problem is further compounded by the laws of physics, which describe the motions of all physical particles. Given these laws, we can theoretically predict the physical behaviour of any publicly observable system. As such, there is no room for mental intervention in the physical world (ibid). The physical world is said to be causally closed, meaning that no events external to the physical world can have causal efficacy with the physical world. And if there were to be a mental intervention in the physical universe, we should be able to observe it as a violation of the laws of physics.

Dualists can respond to this problem by arguing that the mental does not, in fact, have causal efficacy with the physical. Rather, they could argue for epiphenomenalism, which states that mental events are caused by physical events, but that they have no causal influence on the physical (Chalmers, 1996).

This argument, however, is flawed in two respects. Firstly, if the mental does not have causal efficacy on the physical, then my desire to move my arm is not part of the cause for my arm moving. But if that is the case, then what is my desire to move my arm doing? Why would mentality have evolved if it serves no purpose? It seems that according to epiphenomenalism, mentality is just along for the ride, but doesn't actually do anything.

Furthermore, the argument for epiphenomenalism only addresses one side of the problem. It addresses the causal efficacy (or lack thereof) of the mental on the physical, but it does not address the relationship in the other direction. 'If it is mysterious how the non-physical can have it in its nature to influence the physical, it ought to be equally mysterious how the physical can have it in its nature to produce something non-physical' (Robinson, 2020, 8). As epiphenomenalism does not address how the physical can produce the mental, it does not adequately address the problem of causal interaction between the two types of substances (ibid).

In addition to the problem of causal interaction, dualism also faces the dual problems of evolution and foetal development. Since humans evolved from primitive single-celled organisms which (according to Cartesian dualism) did not have minds, why would immaterial minds have associated themselves with physical bodies at a more advanced stage of development? And since the purely physical process of evolution resulted in the existence of human beings, what purpose would these minds even serve? (Lycan, 2003)[10]

Likewise, (according to Cartesian dualism), there is no mind associated with a zygote, and yet it develops into a foetus, a baby, a child and eventually an adult. At what point in this process would a mind become associated? And given the successful development involving purely physical processes, what purpose would a mind serve? (ibid)

The final critique of dualism that I address is that of the existence of a distinct mental substance, such as a soul or spirit. According to Hume, when one searches for the *bearer* of mental properties (ie, the soul), one only finds more mental properties. As such, Hume argues that the mind is nothing but a 'bundle' of mental states. We are not souls who *have* (or bear) thoughts, ideas, emotions, etc. Rather we are a bundle of thoughts, ideas, emotions, etc, that are bound together to form a self. In other words, according to Hume, the self supervenes on experience, rather than experience supervening on a separate self (Hume, 2003).[11] I return to various aspects of the Humean bundle theory below. For now, I accept it as a valid (if not quite decisive) critique of the Cartesian notion of self which is critical to substance dualism.

Given the problems of causal interaction, contravention of the laws of physics, epiphenomenalism, evolution, foetal development and Hume's critique of a soul or spirit, it seems unlikely that dualism is capable of resolving the mind-body problem. In the following chapter I discuss various monist responses to the problem and demonstrate that while monist theories have advantages over dualism, they all face varying problems of their own.

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[10] Non-naturalistic dualists, such as theistic dualists, might attribute the association of minds with bodies to God. Such an approach is beyond the scope of this dissertation.

[11] Hume's critique addresses the substance component of dualism but does not specifically address the dualism aspect of it. In fact, the Humean Bundle theory is compatible with dualism broadly, as long as one accepts that experience is the primary mental substance, and that subjects of experience are comprised of experiences. So, there can be still be two different types of substances – fundamental physical matter on the one side, and immaterial experience on the other. This position can be called 'bundle dualism', which is a radical variation of Cartesian dualism (Robinson, 2020)

Chapter 2 – Monist Responses to the Mind-Body Problem

2.1 – Physicalism

The problems relating to dualism became increasingly clear with the advent of Newtonian physics and the increasingly mechanised world. Newtonian physics seemed to demonstrate that the physical universe was perfectly predictable (given enough information) and behaved in a deterministic, law-like manner. Given the position and momentum of all the particles in any closed system, one could now seemingly predict, with perfect precision, the future position and momentum of all particles within the system (Lycan, 2003).

Simon de Laplace introduced the idea of an omniscient being who has absolutely perfect knowledge of the position and velocity of every particle in the universe as well as all of the forces that they were subject to. This omniscient being has the ability and computation power to apply Newton's laws of physics to predict the behaviour of all these particles. 'For such an intellect nothing would be uncertain, and the future just like the past would be present before its eyes' (Laplace, in Carroll, 2017, 32-33).

Based on Newtonian laws, 'Laplace's Demon' (as this omniscient being was termed) would be able to predict all future states of the universe with perfect accuracy. '[Laplace] realized that there was a simple answer to the question "What determines what will happen next?" And the answer is "The state of the universe right now"' (ibid, 32). And if the future state of the universe is perfectly predicable based on the current state of the universe, then what role could consciousness or mentality possibly play? Just as the future position of planets revolving around the sun can be predicted without reference to god, mental phenomena, or any other non-physical substance or event, so can the future position of every atom in a human body. The notion of a non-physical substance that has causal impact on the physical universe is therefore deeply problematic, as the physical universe is deemed to be causally closed as per Newton's laws.

One response to this problem is to deny the central of premise of dualism, that mind and matter are separate types of substances. And given that our bodies are physical entities within the perfectly predictable physical world, it is perhaps natural to rather state that everything in the universe is physical, and that mind therefore supervenes on matter. This seems to resolve the problem of causal closure of the physical world, because mind is no longer something different

than or outside of matter, but rather an aspect of the physical. This is the central doctrine of physicalism.

> [Physicalism] is generally taken to hold that everything in the world is physical, or that there is nothing over and above the physical, or that the physical facts in a certain sense exhaust all the facts about the world. In our language, materialism [or physicalism] is true if all the positive facts about the world are globally logically supervenient on the physical facts. (Chalmers, 1996, 41)

Physicalism is the dominant philosophical and scientific paradigm of our time. From a physicalist perspective, dualism appears to be somewhat naïve. While the mind and body may *seem* to be two separate sorts of substances, advances in science rather seem to point to a monistic ontology, whereby everything is reducible to (or at least supervenes on) physical laws. From this perspective, while we may not yet understand exactly *how* mind reduces to matter (or supervenes upon matter), it is only a matter of time before we do.

The notion that mind is scientifically reducible to matter is called 'reductive physicalism'. According to reductive physicalism, mental properties are 'nothing but' physical properties. In contrast to reductive physicalism, there is also 'non-reductive physicalism', which states that the physical universe is ontologically fundamental, but mental states are not reducible to the physical. According to non-reductive physicalism, *descriptions* of mental events cannot be reduced to *descriptions* of physical events, but mental states supervene on physical states. The problem of understanding the relationship between mental and physical states is thus a problem of language rather than metaphysics (Stoljar, 2021).

According to non-reductive physicalism, a mental property is not reducible to a physical property, but it is nonetheless *realized* by a physical property. Mental states (insofar as they are deemed to exist) are understood as complex configurations of physical particles (such as brains) which exhibit properties whose descriptions are not reducible to the descriptions of lower level physical particles. I briefly review various forms of reductive and non-reductive physicalism below.

There are various forms of reductive physicalism, such as behaviourism, identity theories (both type- and token-), and functionalism. Behaviourism states that mental states are identical to, or reducible to behavior (Graham, 2019); Identity theory states that mental states are identical to, or reducible to the physical brain (or a *type* of physical entity similar to the brain as per type

identity theory) (Smart, 2000), and functionalism states that mental states are identical to, or reducible to a distinctive set of functional relationships, which can be likened to software programs on computers (Lycan, 2003).

All forms of reductive physicalism state that mental states are nothing but their corresponding physical states, be they behavioural, physically identical, or functional. As such, there is no problem of causal interaction between the mental and the physical, simply because the mental *is* physical. However, reductive physicalism comes up against a serious problem as a result of this claim.

The problem with reductive physicalism is that it does not seem to account for the first person, introspective 'feel' of mental states.

> The quale of a mental state or event (particularly a sensation) is that state or event's feel, its introspectible "phenomenal character," its nature as it presents itself to consciousness. Many philosophers have objected that [reductive physicalism] cannot "explain consciousness," or illuminate or even tolerate the notion of what it feels like to be in a mental state of such-and-such a sort. Yet, say these philosophers, the feels are quintessentially mental – it is the feels that make the mental states the mental states they are. Something, therefore, must be drastically wrong with functionalism [and reductive physicalism in general]. (Lycan, 2003, 55)

Nagel states that any successful response to the mind-body problem must explain the subjective character of consciousness, rather than explain consciousness away by reducing it to behavior or function.

> I do not deny that conscious mental states and events cause behavior, nor that they may be given functional characterizations. I deny only that this kind of thing exhausts their analysis. Any reductionist program has to be based on an analysis of what is to be reduced. If the analysis leaves something out, the problem will be falsely posed. It is useless to base the defense of materialism [or physicalism] on any analysis of mental phenomena that fails to deal explicitly with their subjective character. (Nagel, 1974, 2)

As such, functional, behavioral, or physical identity descriptions of consciousness are insufficient, insofar as they neglect to address the subjective nature of consciousness. If we accept that my desire to move my arm is a cause of my arm moving, any description of

consciousness that refers solely to the movement of my arm, or the brain state associated with such movement, would be incomplete. A complete description of consciousness must also describe my subjective desire to move my arm.

This problem can be expressed in a number of ways. I focus on the 'inverted spectrum argument' (Chalmers, 1996), the 'knowledge argument' (Jackson, 1998) and the 'philosophical zombies argument' (Chalmers, 1996) to illustrate the problems associated with reductive physicalism.

According to the inverted spectrum argument, two people could have inverted experiences of colour, yet have the same physical responses to them. For example, upon seeing an 'objectively' red traffic light, two people could conceivably have different subjective experiences. Your phenomenal experience when seeing the traffic light could be one of red-ness while my phenomenal experience could be different (for example, it could be similar to your phenomenal experience of green-ness). However, our physical responses to a red traffic light could be identical – we would both stop at the light (our behaviour would be identical), our brains would be in the same physical states (identity theory), and our brains could run the same functional 'programs' which cause us to stop at the traffic light (functionalism). However, given that my phenomenal experience of the red light is similar to your phenomenal experience of a green light (and visa versa), clearly our phenomenal experiences are not the same, even though the physical manifestations of our experiences are. As such, the mental is not identical to, nor is it reducible to the physical.

Another argument against reductive physicalism is the 'knowledge argument'. Jackson introduces a specific form of this argument known as 'Mary's room'. We are asked to imagine an omniscient scientist named Mary who has spent her entire life studying colour from within a black and white room. Mary knows all the physical information about what goes on when we see a specific colour. She knows the wavelengths associated with each colour, the brain states of an observer seeing a specific colour, the physical response of such an observer to the colour, etc. The question is, does Mary learn anything new when she is released from the black and white room and has her first experience of seeing red? (Jackson, 1982)

Intuition seems to tell us that, yes, Mary learns what it is like to see the colour red. All her previous knowledge was regarding physical, objective facts about the colour red, but she had never *experienced* red before. And if she learned something new, after already knowing all the

physical facts, then clearly the physical facts are not all there is to know. As such, the mental must be more than the physical, so reductive physicalism must be false (ibid).

The 'philosophical zombie' argument as proposed by Chalmers (1996) further problematizes reductive physicalism. Chalmers asks us to imagine beings which are physically identical to us, but without conscious experience. The bodies of these zombies have the same atomic structure as our bodies do and they behave exactly like we do, but, by definition, there is nothing that it is like to be these zombies. While they may fiercely debate philosophical issues with seeming passion, there are no inner mental states associated with the zombies or their behaviour. Likewise, these zombies may cringe and cry out if we damage their bodies, but they have no inner experience of pain (Chalmers, 1996).

Given that these zombies are conceivable, according to Hume's conceivability principle, they are necessarily possible. And if it is possible for beings to be physically identical to us, but without mental properties, then the mental cannot be reducible to the physical.

Another means of stating the conclusion to these arguments is that there is an 'explanatory gap' between the mental and the physical (Levine, 1983). (I discuss other types of explanatory gaps which apply to other theories of consciousness below.) The explanatory gap between the mental and the physical is the epistemic counterpart to the hard problem of consciousness. The explanatory gap highlights the lack of epistemic necessity between the mental and the physical, while the hard problem highlights the lack of metaphysical necessity between the mental and the physical. The hard problem is that of why physical processes should give rise to an inner subjective life at all (Chalmers, 2017b). And the explanatory gap is between physical processes in the brain and mental experiences, and this gap cannot be explained solely by reductive laws.

All these problems highlight a contradiction inherent in reductive physicalism. If consciousness is nothing more than physical properties, then why are we unable to reduce the mental to the physical? Why does it seem that something gets lost when we state the mental in terms of the physical alone?

One potential response to this question is to rather state that the physical is ontologically primary, and that it *realizes* the mental, but that the mental is not reducible to the physical, as per non-reductive physicalism. Non-reductive physicalists take various approaches towards the relationship between the mental and the physical. Eliminative materialists deny that mental

states exist (Dennett, 1991); Anomalous monists state that mental events are identical to physical events, but under their mental descriptions the relationships between mental events are not exhaustively describable by physical laws (Davidson, 1999); and emergentists argue that the mental *emerges* from the physical but is not reducible to it (Chalmers, 1996).

Eliminative materialists state that our common-sense understanding of the mind is deeply flawed and that some or all of the mental states posited by common-sense do not actually exist and have no role to play in a mature science of the mind (Dennett, 1991; Ramsey, 2019, Churchland, 1981).[12] However, given that various theories attempt to resolve the relationship between physical and mental states, denying the existence of mental states seems to be avoiding the problem.[13]

Anomalous monists state that there is no lawlike relationship between the mental and the physical (Davidson, 1999). But since anomalous monists argue for causal efficacy between the mental and the physical, there must be psycho-physical laws which define this interaction. Accordingly, either these laws must exist, in which case anomalous monism is false, or the laws must not exist, in which case there can be no causal efficacy between the mental and the physical. Therefore, if we assume causal efficacy, then anomalous monism is false.

Finally, emergentists argue that the mental emerges from the physical, but is not reducible to the physical. Emergence can be divided into weak emergence and strong (or brute) emergence. 'A high-level phenomenon is weakly emergent with respect to a low-level domain when the high-level phenomenon arises from the low-level domain, but truths concerning that phenomenon are unexpected given the principles governing the low-level domain' (Chalmers, 2006, 1-2). Contrastingly, 'A high-level phenomenon is strongly emergent with respect to a low-level domain when the high-level phenomenon arises from the low-level domain, but truths concerning that phenomenon are not deducible even in principle from truths in the low-level domain.' (ibid, 1). So, the difference between weak and strong emergence is that in weak emergence, a high-level phenomenon is *unexpected* but ultimately deducible*,* whereas in strong emergence, the high-level phenomenon is *not deducible* even in principle.

[12] A similar, but less radical theory is 'illusionism', which asserts that mental states exist, but that the nature of mental states is illusory and contrary to the common-sense understanding of them (Frankish, 2016).
[13] It is worth noting that numerous critics of Dennett and his book 'Consciousness Explained', refer to his book as 'Consciousness Ignored'!

An example of weak emergence can be seen in the laws governing the behaviour of a gas. A gas is subject to the laws of Brownian motion, which do not exist at the more fundamental, molecular level. Likewise, a gas can be described in terms of temperature and pressure, but these properties also do not exist at the more fundamental, molecular level. However, these laws and properties are ultimately reducible to the laws and properties operating at the low-level domain at the molecular level. So, while the higher level laws and properties may be unexpected, they have a nomological relationship with the lower level laws and properties. Weak emergence is common in scientific theories pertaining to different levels of the physical universe.

In contrast, strong emergence would require revisions to the fundamental laws of physics. Without a revised nomological framework, strong emergence would be akin to magic.

> Although strong emergence is logically possible, it is uncomfortably like magic. How does an irreducible but supervenient downward causal power arise, since by definition it cannot be due to the aggregation of the micro-level potentialities? Such causal powers would be quite unlike anything within our scientific ken…. Their mysteriousness will only heighten the traditional worry that emergence entails illegitimately getting something from nothing. (Bedau, 1997, 3)

Emergentist physicalism, by definition, requires strong emergence, and is thus deemed to be incompatible with the known laws of physics. Weak emergence, on the other hand, would require a nomological relationship between the physical and the mental, and would thus be a form of reductionist physicalism, which would then be subject to the arguments stated above.

As demonstrated above, both reductionist and non-reductionist physicalism are subject to various problems. While there are numerous responses to the problems stated, all of them come at great costs (such as epiphenomenalism), or do not sufficiently address the problems stated. As such, an exploration of alternative theories is warranted.

2.2 – Panpsychism

As previously stated, emergent physicalism requires brute emergence to obtain high-level mental facts from low-level physical facts. But what if mental facts were present at the

fundamental physical level? If mental facts were properties of fundamental physical elements, then brute emergence would not be required to obtain mental facts. If quarks and electrons were associated with mental states, then the human mind could conceivably be a complex combination of these mental states, just as the human brain is a complex combination of quarks and electrons (and other fundamental matter).

This is loosely what panpsychists claim. Chalmers defines panpsychism broadly as the thesis 'that some fundamental physical entities have mental states' (Chalmers, 2015, 1). In the narrow sense, it is the claim that *all* fundamental physical entities have mental states.[14] As such, consciousness can be seen as a property of the fundamental particles of matter (either some or all particles), similar to mass, charge and spin. Alternatively, consciousness can be seen as the mental property *behind* or *associated with* mass, charge or spin. As such, panpsychism addresses two metaphysical problems with one solution – namely, 'what is the place of phenomenal properties in nature, and what are the intrinsic properties underlying physical structure? … Fundamental phenomenal properties play fundamental microphysical roles and underlie fundamental microphysical structure' (ibid, 1). In other words, mental properties are the causal basis for physical dispositions, or mental properties are the underlying categorical ground for the laws of physics (ibid; Chalmers, 2019). As such, there is no explanatory gap or problem of causal interaction between the mental and the physical.

This understanding of panpsychism, as it relates to fundamental *physical* entities, is a type of broad physicalism. According to Galen Strawson, 'panpsychism is the most plausible theoretical view to adopt if one is an out-and-out naturalist, a genuinely realistic monist naturalist who holds, as I do, that physicalism is true, that is, that … everything that concretely exists is physical.' (Strawson, 2017, 376). Broad physicalism is compatible with panpsychism as it holds that 'mind or experience is a fundamental feature of concrete reality, already present in the most basic forms of concrete reality' (ibid, 384). In contrast, narrow physicalism, which holds that the physical is fundamentally non-mental, is incompatible with panpsychism.

According to physicalist panpsychists then, physics describes the dispositional properties of physical entities (mass, charge, or spin), but not the categorical properties that underlie them (Goff, 2015). Physics therefore provides us with an incomplete description of fundamental

[14] And in the *narrowest* sense, it is the claim that all physical entities, including composite entities such as chairs, clouds, and heaps of sand, have mental states (see Roelofs, 2019)

reality. ‘The formal nature of such a description entails that it necessarily abstracts not only from the reality of consciousness, but from any other real, categorical nature that material entities might happen to have (ibid, 2).’

Or as Russell states:

> Physics itself is exceedingly abstract and reveals only mathematical characteristics of the material with which it deals. It does not tell us anything as to the intrinsic character of this material. Psychology is preferable in this respect but it is not causally autonomous… But by bringing physics and psychology together, we are able to include psychical events in the material of physics and to give physics the greater concreteness which results from our more intimate acquaintance with the subject matter of our own experience. (Russell in Banks, 2014, 144)

While physicalist panpsychism states that mentality underlies the laws of physics, there are other forms of panpsychism that are not broadly physicalist. Chalmers states that a number of forms of idealism entail panpsychism, specifically micro-idealism and cosmic idealism (Chalmers, 2019). Also, panprotopsychism, the thesis that fundamental entities are precursors to consciousness, has both physicalist and neutral monist forms, and is loosely related to panpsychism. I discuss these other interpretations in the sections on idealism and neutral monism below but focus on physicalist panpsychism here.

Physicalist panpsychists argue that (narrow) physicalist zombies are conceivable but that panpsychist zombies are not. Under physicalism, atoms can be arranged identically to that of our bodies but have no corresponding consciousness. However, under panpsychism, a specific arrangement of atoms (which have phenomenal categorical natures) will necessarily create a conscious subject of experience. Just as the masses of atoms combine to create the masses of objects, the consciousnesses of atoms combine to create the consciousnesses of subjects such as ourselves.

But herein lies the problem. While panpsychism manages to avert the hard problem of consciousness, by positing mentality at the fundamental level, it is subject to the combination (or ‘de-combination’) problem, which some argue is as dire for panpsychism as the hard problem is for physicalism (Goff, 2006). The combination problem is loosely, ‘how do the

experiences of fundamental physical entities such as quarks and photons combine to yield the familiar sort of human conscious experience that we know and love?' (Chalmers, 2017a, 1).

> The non-panpsychist theorist … must confess to a certain degree of ignorance as to how exactly non-conscious particles sum together to make subjects of experience. But similarly the panpsychist … must confess to a certain degree of ignorance as to how exactly little subjects of experience sum together to make human and animal consciousness, which is after all the kind of consciousness we have a pre-theoretical need to explain. It is not obvious that the former kind of ignorance is any greater than the latter. (Goff, 2009, 6)

Chalmers breaks down the combination problem into numerous smaller sub-problems. I specifically address the subject combination problem, the quality combination problem, and the structure combination problem. I utilize the framework of these three sub-problems to discuss issues pertaining to many alternative theories and revisit these problems throughout this dissertation.

The three sub-problems of the combination problem can be described as follows:

> 1) The Subject Combination Problem: How do micro-subjects combine to yield macro-subjects (like ourselves)?
>
> 2) The Quality Combination Problem: How do micro-level phenomenal qualities combine to yield macro-level phenomenal qualities?
>
> 3) The Structure Combination Problem: How does micro-experiential structure combine to yield macro-experiential structure? (Chalmers, 2017a)

The subject combination problem is the thorniest problem for panpsychists and is expressed in a famous passage by William James:

> Where the elemental units are supposed to be feelings, the case is in no wise altered. Take a hundred of them, shuffle them and pack them as close together as you can (whatever that may 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 physical 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.
>
> Take a sentence of a dozen words, and take twelve men and tell to each one word. Then stand the men in a row or jam them in a bunch, and let each think of his word as intently as he will; nowhere will there be a consciousness of the whole sentence. We talk of the 'spirit of the age,' and the 'sentiment of the people,' and in various ways we hypostatize 'public opinion.' But we know this to be symbolic speech, and never dream that the spirit, opinion, sentiment, etc., constitute a consciousness other than, and additional to, that of the several individuals whom the words 'age,' 'people,' or 'public' denote. The private minds do not agglomerate into a higher compound mind. (James in Chalmers, 2017a, 1-2)

The problem with the combination of subjects is further illustrated by the conceivability of panpsychist zombies (Goff, 2009) and the subject summing problem (Coleman, 2016). The panpsychist zombie argument is that it is conceivable that there could be an identical panpsychist universe where micro-subjects are conscious, but macro-subjects, or people are not. It is possible that a complex arrangement of conscious micro-subjects could yield a universe with unconscious macro-subjects and therefore micro-conscious subjects cannot entail macro-consciousness (ibid).

The subject summing problem is stated by Coleman as follows:

> The negative problem, subjects-summing, is effectively an explanatory gap: no amount of talk of subjects coming together seems to entail anything about any further subject. So it doesn't appear that panpsychism can account for the constitution of a macro-subject, which was certainly the aim of constitutive Russellian panpsychism. The positive difficulty is something like a genuine metaphysical stumbling-block or apparent impossibility: How could you hope to produce a phenomenally unified, single-perspective, subject by assembling a group of subjects each of which essentially has its own perspective? (Coleman, 2016, 11-12)

The quality and structure combination problems also pose issues for panpsychists. The quality combination problem can be expressed through the palette problem, which is the problem of how a limited palette of micro-qualities could possibly correspond to the rich macro-qualities of our human experience (Chalmers, 2017a). The quality combination problem relates to the 'austerity hypothesis', which I discuss in Chapter 3.1 below. The issue is that the ground for macro-consciousness is presumably more limited or austere than macro-consciousness itself. As such, the argument is that it is hard to understand how an austere or limited palette can account for the rich qualities of our experiences.

Similarly, the structure of our macro-experience is rich and complex, involving the structure of our various perceptions, emotions, complex thoughts, etc. How could a presumably simple structure of micro-experiences yield such a complex macro-structure (ibid)? Furthermore, the structural mismatch problem states that 'macrophenomenal structure (of consciousness) seems quite different from macrophysical structure (of the brain, say) where constitutive Russellian panpsychism would seem to require that the structures be the same' (ibid, 13).

One response to the subject combination problem is to 'deflate the subject'. According to this approach, the subject combination problem is only a problem if we assume that the fundamental conscious entity is a *subject*. If, however, we allow for the fundamental conscious entity to be phenomenal, but (somehow) subject-less, then there is no subject combination problem, as there are no fundamental subjects to combine. Russell states that the notion of a subject or self is a 'logical fiction, like mathematical points and instants' (Russell in Banks, 2014, 134-5). He argues that the self is not revealed by observation but is rather a gratuitous assumption that is merely linguistically convenient (ibid).

Critics of panpsychism therefore argue that we 'should retain qualities in micro-ontology, but deny that they require subjects to experience them' (Coleman, 2017, 21). Under this view, subjects are deemed to be composite, rather than simple entities. The fundamental elements constitute subjects but are not subjects in and of themselves. Rather, the fundamental elements are deemed to be 'unexperienced qualities' (ibid). As the fundamental elements are unexperienced, however, they are deemed to be *proto*-experiential, and therefore not strictly mental. As such, this theory is generally deemed to be a form of neutral monism. I therefore discuss this alternative theory in the section on neutral monism below.

In response to the quality combination problem, panpsychists argue that barren or austere qualities regularly combine to create rich qualities in the narrow physical universe, and there is no reason to think that such quality combination should be a problem in the broad physical universe (which includes phenomenal qualities). The qualities of red, blue and yellow, can combine to create the qualities of the entire colour spectrum, so a limited palette can clearly generate a rich tapestry. Coleman utilizes this argument which I return to in Chapter 3.2 on PQ below.

In response to the structure combination problem, panpsychists might argue that, as with the quality combination problem, simple micro-structures regularly correspond to complex macro-structures. For example, the simple structure of bricks can be utilized to generate the complex structure of a building. However, the structural mismatch problem still applies so long as one assumes an isomorphic relationship between the physical and the phenomenal. However, while this assumption applies to Russellian panpsychism, it does not necessarily apply to all other forms of panpsychism or panprotopsychism. The notion of a non-isomorphic relationship between the physical and the phenomenal is central to both PQ and HNM. I discuss such a relationship in chapters 3.2 and 4.9.4 below.

One characteristic of panpsychism, as discussed thus far, is that it operates with a background assumption of priority pluralism, which is the idea that the fundamental 'stuff' of reality exists at the micro-level. (Miller, 2018). But another option is to argue that the fundamental subjects are not *micro*-subjects that *combine* to create macro-subjects, but rather the fundamental subject is a *cosmic* subject that *de-combines* to create macro-subjects (Shani, 2015; Nagasawa & Wager, 2017; Kastrup, 2014, 2017, 2018; Matthews, 2011). This proposition is broadly called 'cosmopsychism' (CP). According to CP, 'phenomenality is prevalent because the whole cosmos instantiates phenomenal or protophenomenal properties.' (Nagasawa & Wager, 2017, 1) Furthermore, according to CP, cosmic consciousness is ontologically primary, and macro-consciousness then supervenes upon it (ibid; Shani, 2015).

However, the strategy of inverting the bottom-up assertion of micro-psychism does little to alleviate the problem of subjects entailing other subjects. 'In essence the problem is about subjects being proper parts of other subjects (the subject-subject proper part-hood relation), hence the 'size' of the subjects in question does not matter (Miller, 2018, 141). And '[A] straightforward conceivability argument…holds that one can conceive of the cosmic subject with

all of its cosmic mental states without any further distinct subjects, and in particular without any macro-subjects' (Chalmers, 2019, 21-2). As such, CP seems to suffer from essentially the same problem as micropsychism.

There are many nuances of CP which relate to my theory of hyperdimensional neutral monism. As such, I discuss CP in detail in Chapter 3.1 and I discuss the relationship between CP and HNM in Chapter 4.8.

There are other strategies for responding to the combination problem, but none seem to adequately resolve the issue without facing other dire consequences. Emergent panpsychists argue that macro-subjects strongly emerge from micro-subjects, but this faces a similar problem of strong emergence to emergent physicalists. Identity panpsychists argue that macro-experiences are identical to micro-experiences, but this requires that the experiences of atoms are identical to human experiences and therefore seems untenable. As such, while panpsychism seems to resolve many of the issues pertaining to dualism and physicalism, the unresolved nature of the various combination problems necessitates the exploration of other options.

2.3 – Idealism

One monistic alternative to physicalism and panpsychism is idealism. Idealism is generally associated with George Berkeley and his statement 'esse est percipi', or 'to be is to be perceived'. According to Berkeley:

> It is evident to any one who takes a survey of the objects of human knowledge, that they are either ideas actually imprinted on the senses, or else such as are perceived by attending to the passions and operations of the mind, or lastly ideas formed by help of memory and imagination… (Berkeley in Downing, 2011, 7)

As such, idealism is a sort of inverse of physicalism. Whereas physicalists broadly believe that the physical is fundamental, and that mind supervenes upon it, idealists broadly believe that the mental is fundamental, and that the physical world supervenes upon it. According to Berkeleyan idealism, the physical world is not fundamentally made of atoms or molecules, but rather ideas. In other words, 'appearance constitutes reality' (Chalmers, 2019, 1).

The question arises of appearances to whom? If they are appearances to humans, then why does my physical world seem to correspond to your physical world, given that each of our physical worlds are just appearances in our distinct minds? And what is the difference between a veridical object of perception and a hallucination? If they are both appearances in my mind, then is there actually a difference between them? Also, what happens when no one is perceiving an object in the physical world? If there is no one to perceive a specific rock, does the rock no longer exist? (Downing, 2011)

Berkeley responds to these questions by arguing that the physical world is an appearance in the mind of god. He notes that we have no volitional control or 'will' over what we perceive, feel or think, and argues that the will for these events must therefore come from god. The existence of god then addresses all the questions stated above. My physical world corresponds to your physical world, because the physical world is an image in the mind of god, rather than in our respective human minds. The difference between a veridical object and a hallucination, is that the veridical object is a stable image in the mind of god, whereas the hallucination is an unstable image in a human mind. And god is always perceiving all aspects of the physical world, so all aspects of the physical world exist regardless of whether any humans are perceiving them (ibid).

According to Berkeley, ideas themselves are passive, whereas god (or spirit) is active. He states that (active) spirit forms (passive) ideas, but ideas cannot form a spirit, as all ideas are passive. The distinction between passive ideas and active spirits is thus in line with a Cartesian view of the self. It implies a distinct subject (god), who has ideas (which are associated with the physical universe). As such, it is incompatible with Humean bundle theory, as it posits that ideas supervene on a subject.

Berkeley's reliance on god raises the question of the relationship between god and human consciousness. If god is the active spirit whose ideas are the physical universe, how do humans fit into the picture? Are we ideas in the mind of god, and therefore passive? Or are we spirits in our own rights, and therefore active? And if we are active, how do we act on a world, which is already pre-determined by god?

A full analysis of the problems with Berkeleyan idealism is beyond the scope of this dissertation. However, I accept that the reliance on god is problematic, and turn to other forms of idealism that don't depend on upon this notion.

Berkeleyan idealism can be classified as a form of anti-realist, or subjective idealism (Chalmers, 2019). It argues that the physical world is 'nothing but' an image in the mind of an observer. However, there are also realist, or objective forms of idealism.[15] According to these various theories, 'appearances concerning the physical world may play no special role. It is the structure and relations among experiences rather than their specific content that matters' (ibid, 3). As such, the physical world is not an image in the mind of a subject, but rather a complex aspect of a mental world. Just as most forms of physicalism accept that mental facts exist, but that they supervene physical facts, realist forms of idealism accept that physical facts exist, but that they supervene on mental facts.

Chalmers broadly defines idealism 'as the thesis that the universe is fundamentally mental, or perhaps that all concrete facts are grounded in mental facts' (ibid, 1).[16] As such the idea that the physical supervenes on the mental does not necessarily result in anti-realist, Berkeleyan type idealism, whereby the physical is nothing more than an image in the mind of some observer (be it human or god) (Guyer & Horstmann, 2015). Rather, '[t]he physical world really exists out there, independently of our observations; it just has a surprising nature…' (Chalmers, 2019, 3). Unlike subjective idealism, objective idealism can be seen as a sort of naturalistic, scientific view which has the potential to explain the relationship between the mental and the physical without explaining either of them away.

> According to idealism, all of reality – the entire universe – exists in mind, although not all in your egoic mind alone … Mind is not generated by configurations of matter and energy. Instead, configurations of matter and energy arise from the dynamics of mind…. Mind is the ground of the real. (Kastrup, 2014, 56-57)

Objective idealism can be compatible with both a Cartesian and a Humean understanding of the self. 'Subjective idealism' states that mental states are had by a distinct subject and is therefore compatible with Cartesian notions of the self. 'Objective idealism' states that mental states exist

[15] The notion of 'realist idealism' is sometimes critiqued as oxymoronic. However, Chalmers uses this term to describe a form of idealism where the physical 'objectively' exists, but it supervenes upon the phenomenal world. As such, the term 'objective' idealism is often used in place of 'realist' idealism.

[16] Chalmers is referring to forms of ontological idealism only. Epistemological idealism, which argues that all of forms of knowledge are forms of self-knowledge as we cannot know anything outside of our own mental events, is beyond the scope of this dissertation. Hume and Kant can both be classified as epistemological idealists, but not ontological idealists. (See Guyer & Horstmann, 2015 for a detailed discussion on the relationship between ontological and epistemological idealism.)

independently of a subject and is therefore compatible with Humean notions of the self. (Chalmers, 2019)

A critical question for idealists to answer is what sorts of minds constitute reality? Chalmers identifies three potential answers to this question, namely micro-idealism, macro-idealism and cosmic idealism. These three forms of idealism correspond with their relative physical scale. Micro-idealists argue that physical reality supervenes on micro-level mentality, or the mentality of fundamental, sub-atomic matter; Macro-idealists argue that physical reality supervenes on macro-level mentality, or the mentality of subjects such as ourselves; Cosmic idealists argue that physical reality supervenes on a cosmic level mentality, or the mentality of the cosmos as a whole (ibid).

Given that macro-idealism corresponds to human level mentality, it does not fit squarely in the realist-idealism category. If human mentality did not exist, according to macro-idealism, neither would the physical world. As such, the physical is dependent on human experience, and I therefore believe that it cannot be realist. Micro- and cosmic idealism, however, do not rely on human mentality. Rather, according to micro – and cosmic idealism, the physical world supervenes on micro- or cosmic-level mentality respectively.

But neither of these views is committed to the notion that mentality is associated with *all* matter. 'Idealism entails that all reality is in mind. But that does not imply that rocks, tables, and chairs have their own form of consciousness. One should not confuse the claim that all of reality is in consciousness with the idea that everything is conscious' (Kastrup, 2014, 66). Here we see a critical distinction between micro- and cosmic- idealism. According to micro-idealism, atoms (or some fundamental matter) are, by definition, conscious. In contrast, according to cosmic idealism, atoms exist *within* consciousness, but are not themselves (necessarily) conscious.

Micro- and cosmic idealism face similar combination problems to their panpsychist counterparts. In the case of micro-idealism, how do the micro-level mentalities combine to create human level consciousness? And in the case of cosmic idealism, how does the cosmic-level mentality de-combine to create human level consciousness? (Chalmers, 2019)

In addition to the combination problem(s), micro-idealists also face the problem of the nature of spacetime. According to micro-idealism, micro-level mentality does not exist in spacetime – rather spacetime supervenes on micro-level mentality. But it is hard to see how these micro-

level properties could 'ground the fundamental relational properties as spatiotemporal properties seem to be…. {I}t is very hard to understand what a fundamental experiential relation between distinct subjects of experience might be' (ibid, 14-15).

Cosmic idealism on the other hand, does not face the problem of spacetime, as spacetime supervenes solely on cosmic mentality so no relations between distinct subjects are required. There are also options available to the cosmic idealist to address the de-combination problem. For example, Bernardo Kastrup suggests an analogy with 'dissociative identity disorder' (DID – previously termed 'multiple personality disorder') to describe cosmic fragmentation. According to Kastrup, macro-subjects, such as ourselves, can be likened to individual alters (or personalities) of the cosmic subject. These alters are all aspects of the cosmic subject, but do not have access to other alters, so they retain their boundedness (Kastrup, 2017a-c, 2018). According to Kastrup, '[y]our egoic mind – that limited awareness you identify yourself with – is, … merely a segment of the broad, universal canvas of mind' (Kastrup, 2014, 58).

Another option in responding to the combination (or de-combination problem) is to describe macro-subjects as 'localizations' or 'vortices' within a cosmic ocean. In this metaphorical context, macro-consciousnesses are likened to whirlpools within the vast ocean. As whirlpools are nothing other than dynamic constructions or localizations of water, macro-consciousnesses are nothing other than dynamic construction or localizations of cosmic consciousness. As such, macro-consciousnesses exist within, and are grounded by, cosmic consciousness (ibid). The notions of macro-subjects as alters, localizations or vortices are employed by both CP and HNM. I discuss these responses in detail in chapters 3 and 4 below.

As idealism is subject to the problem of how micro- or cosmic-subjects constitute macro-subjects, an alternative option is to 'deflate the subject' and state that there are micro- or cosmic-*experiences*, but no micro-or cosmic-*subjects*. Or even experience can be deflated, such that there are micro- or cosmic- *qualities*, but that these qualities are not necessarily *experienced*. These approaches may lead to neutral monism, which I discuss in the following chapter.

2.4 – Neutral Monism

Neutral monism is the thesis that 'minds and physical objects are essentially two different orderings of the same underlying neutral elements of nature' (Banks, 2010, 173). Most neutral monists define the underlying elements as *neither* mental *nor* physical, but other definitions of neutrality, such as *both* mental *and* physical are also utilized (Stubenberg, 2016). Irrespective of the definition of neutrality, neutral monists posit that both mind and matter supervene upon the neutral ultimates.

Neutral monism accounts for the relationship between the mind and the brain in terms of something more basic about the natural order. As such, 'the constituents of the universe have properties that explain not only its physical but its mental character' (Nagel, 2012, 56).

One version of neutral monism is panprotopsychism, which can be described as the view that fundamental entities have properties that are precursors to consciousness, and that these properties can collectively constitute consciousness in macro-systems (Chalmers, 2015). Protophenomenal properties are not themselves phenomenal, but they can constitute phenomenal properties due to their functional relationships.

Chalmers defines panprotopsychism as 'the view that some fundamental physical entities have protophenomenal properties' (ibid, 15). However, this definition is broadly physicalist in that it asserts that physical entities are fundamental particulars with protophenomenal properties. The protophenomenal properties supervene on the physical particles. In contrast, the neutral monist version of panprotopsychism asserts fundamental protophenomenal particulars as the ground for both physical and phenomenal properties. In this sense, the ultimate ground is actually both protophenomenal and protophysical. As Russell states,

> The stuff of which our world is composed is, in my belief, neither mind nor matter, but something more primitive than either. Both mind and matter seem to be composite, and the stuff of which they are compounded lies in a sense between the two, in a sense above them like a common ancestor. (Russell in Banks, 2014, 128)

In this way, neutral monism can be seen as a form of property dualism (Chalmers, 1996). It is monistic in the sense that there is one type of fundamental ultimate or ground, but it is property dualistic in the sense that this type of ultimate has two types of properties – physical and phenomenal. It is important to note that these properties are not necessarily present at the fundamental level. Just as 'liquidity' is not a property of fundamental matter, neither physicality,

nor phenomenality are necessarily properties of fundamental neutral ultimates. Rather, they can be seen as properties that are dependent upon the functional and structural relationships between ultimates, just as liquidity is dependent upon the functional and structural relationships between atoms (Stubenberg, 2016). ‘’Mental’ is a character, like “harmonious” or “discordant”, that cannot belong to a single entity in its own right, but only to a system of entities’ (Russell in Stubenberg, 2016, 3). Arguably, the same can be said for ‘physical’.

As the mental and the physical supervene upon the same underlying neutral elements, it is the functional relations between the neutral elements that determine whether they are expressed as mental or physical (Banks, 2010). In other words, elements ordered in one specific way manifest as physical objects, whereas the same elements ordered in another way manifest as mental experiences.

But neither the physical, nor the phenomenal are fundamental. Rather:

> … the natural world is made up of individualized events embedded in real causal–functional relations to each other. These events and causal–functional relations are what really exist, and the rest (objects, extended bodies, fields, space-time, brains, and minds) are constructed out of them. These events are called “elements” by Mach, “event particulars” by Russell, and “pure experiences” by James. (Banks, 2014, 14)

Irrespective of the labels, how can we understand or describe these ultimates in positive terms? Firstly, we can understand them as being prior to subjects of experience. Neutral monists adopt a Humean, rather than Cartesian, notion of the self. Subjects of experience are understood to be bundles of ultimates which are expressed as both mental and physical, in the form of minds and bodies.

Based on this understanding, how do mind and matter relate to each other? Do mind and matter have causal efficacy with each other? If so, how? And if not, why does it appear that they do? As both the mental and the physical supervene on neutral elements, the mechanism of interaction between the mental and physical must be addressed (Seager, 2002).

Russell states that ‘we cannot say that ‘matter is the cause of our sensations’(Russell in Stubenberg, 2016, 16) and Mach states ‘Bodies do not produce sensations’ (Mach in Stubenberg, 2016, 16). Causation between mind and body rather reduces to causal, functional relations among ultimates (ibid). Given reducibility to ultimates, mind and matter do not have

causal efficacy with each other. Rather, mind and matter *correspond* with each other, due to the fact that they are both reducible to ultimates and/or the functional relationships between ultimates. A similar relationship of correspondence, rather than causation, is critical to the concept of hyperdimensional neutral monism (Frenkel, 2022), which I discuss in chapter 4 below.

As neutral monism refutes the physicalist claim that the mental supervenes on the physical, it is not subject to the hard problem of consciousness, which states that there is an explanatory gap between the mental and the physical (Chalmers, 1996). Likewise, as it refutes the panpsychist and idealist claim that subjects are ontologically primary, it is not subject to the subject combination problem.

However, it is subject to various aspects of the combination problem regarding how neutral elements, which are not themselves mental, can possibly combine to create unified conscious entities such as ourselves (Chalmers, 2015, 2017). This problem can also be expressed as a series of explanatory gaps. The first gap is between protophenomenal and phenomenal entities. How do non-phenomenal ultimates combine to create phenomenal experience? Also, as neutral monism avoids the panpsychist subject combination problem by refuting the fundamentality of subjects, it then faces a non-subject/subject gap. How do non-subjective ultimates combine to create macro subjects?

These gaps demonstrate that there is no a priori relationship between protophenomena, phenomena, or subjects of experience. Each of these gaps can be expressed as conceivability arguments such as zombie visualizations. We can conceive of a world which is protophenomenally identical to our own, but in which the protophenomena do not necessitate phenomena, nor do they necessitate subjects. Subjects are partly defined as a unified stream of experiences, but what, according to neutral monism, performs such unification?

Neutral monism is also subject to the quality- and structure-combination problems:

> 1) The Quality Combination Problem (for neutral monists): How do the qualities of a few neutral ultimates yield the vast array of qualities of which we are aware.
>
> 2) The Structure Combination Problem (for neutral monists): How does the structure of neutral ultimates instantiated in the brain constitute the structure of awareness?

Coleman responds to the quality combination problem from the perspective of PQ. According to Coleman, the quality combination problem can be addressed by comparing the brain to an impressionist painting. Just as the quality of the painting is a composite of the qualities of the dots in the painting, so is the quality of our awareness composed of the qualities of the neutral ultimates. I address this response in the focused section on PQ below.

Regarding the structure combination problem, as with panpsychism, the problem can be made explicit through the structural mismatch problem. This problem applied to neutral monism states that the structure of consciousness seems quite different from the structure of the brain, and as both consciousness and the brain supervene on a single type of neutral ultimate, their structures should theoretically be similar. However, as stated above, neutral monism can be understood as the thesis that neutral ultimates structured in one particular manner manifest as physical, while the same ultimates structured in another manner manifest as phenomenal. As the differentiating factor between manifestation as mental or manifestation as physical is that of structure, it should not be surprising that the mental and the physical have different structures.

Furthermore, there seems to be an implicit assumption within the structural mismatch problem that the structure of the brain must necessarily have an isomorphic relationship to the structure of awareness. But an isomorphic relationship between the consciousness and the brain is not required. I explore the justifications for and implications of a non-isomorphic relationship between brain and mind in the section on HNM below (Frenkel, 2022).

There are two final problems for neutral monism, regarding the term ‘neutral’ and its consequences. Firstly, there is an argument that the description of the fundamental elements is not actually neutral, but rather favors either physical or mental. Chalmer’s definition of panprotopsychism as the view that ‘some fundamental physical entities have protophenomenal properties’, seems to favor physicalism, as the entities are fundamentally physical. And Mach’s, James’, and Russell’s respective terminology of ’sensations’, ‘pure experience’, and ‘sensations and percepts’ seems to favor idealism, as such terminology seems to relate more towards the mental than the physical (Stubenberg, 2016).

The second problem is almost the opposite. In terming the fundamental elements as ‘neutral’, there is a concern that ‘mental’ and ‘physical’ are eliminated. Given that all theories of mind

strive to explain the relationship between the mental and the physical, unwittingly eliminating either (or both) of them would be catastrophic for neutral monists (ibid).

It is therefore critical that neutral monists explain both consciousness and the physical universe without explaining either of them away. As such, any successful version of neutral monism will have to explain the following:

1. What are the [neutral] ultimates and what is their nature?
2. What is the relationship of these ultimates to matter?
3. What is the relationship of these ultimates to mind? (Stubenberg, 2016,1)

In addition to these questions, I also believe it is critical for a successful version of neutral monism to account for:

4. What is the seeming relationship of mind to matter?[17]

I address these questions in relation to both PQ and HNM in Chapters 3 and 4 below.

Chapter 3 – Narrow Focus – Cosmopsychism and Panqualityism

Having broadly explored both dualist and monist responses to the mind-body problem, I turn my focus to a narrow exploration of CP and PQ, as these theories form the foundations for hyperdimensional neutral monism, which I introduce in Chapter 4. For the purposes of this narrow exploration, I specifically focus on CP as per Itay Shani (2015; Shani & Keppler 2018) and Bernardo Kastrup (2014, 2017a-c, 2018) and PQ as per Sam Coleman (2012, 2014, 2016, 2017; Coleman & Goff, 2020).

3.1 Cosmopsychism

Cosmopsychism is broadly the thesis that the universe has mental states (Chalmers, 2019). It can be seen as a branch of panpsychism, and the inverse of micro-psychism. Whereas micro-psychism states that fundamental micro-entities are associated with mental states, CP states that the universe as a whole is fundamental and that there are mental states associated with this monistic universe. Whereas micro-psychism states that the consciousness of micro-entities

[17] Alternatively, if mind and matter do not relate directly to each other, then why does it appear that they do?

combine to create the consciousness of macro-entities such as ourselves, CP states that the consciousness of a single cosmic entity 'de-combines' to create the consciousness of macro-entities such as ourselves.

CP can broadly be divided into 'dual-aspect CP' and 'idealist CP'. Dual aspect CP states that the physical universe is fundamental and that it has mental states; idealist CP states that the mentality associated with a cosmic entity is fundamental, and that the physical universe supervenes on such mentality. (Kastrup, 2018)

Kastrup describes dual aspect CP as follows:

> it sticks to the bottom-up panpsychist view that a phenomenal ultimate has both phenomenal and non-phenomenal properties. This way, whereas it takes the cosmos as a whole to be the sole phenomenal ultimate there is, this interpretation grants that the abstract relational properties of the cosmos are not phenomenal. … [T}he intrinsic aspect of the cosmos is phenomenal, but its extrinsic aspect — the physical structure we can objectively measure in a scientific sense — is non-phenomenal and circumscribes the cosmos's phenomenal field. In a sense, the extrinsic, physical aspect of the cosmos *bears* phenomenality within in. (Kastrup, 2018, 134)

In contrast, according to idealist CP,

> [n]othing exists outside or independent of cosmic consciousness. As such, under this interpretation *one should say that the cosmos is constituted by phenomenality, as opposed to bearing phenomenality.* In other words, here the perceivable cosmos is in consciousness, as opposed to being conscious (Kastrup, 2018, 135 italics mine).

The difference between dual aspect CP and idealist CP is thus the relational grounding of the physical and the phenomenal. For dual-aspect CP, the physical bears the phenomenal, so the physical is the fundamental ground. For idealist CP, the physical literally exists within the phenomenal, so the phenomenal is the fundamental ground. However, as stated above, this does not necessarily result in anti-realist, subjective idealism, as the physical world is still deemed to have an objective existence, but such existence supervenes on the mental.

While the distinction between dual aspect CP and idealist CP is critical, there is another distinction which is equally critical, and which I believe Kastrup conflates with the dual-aspect /

idealist dichotomy. This distinction is between Cartesian and Humean notions of the self. Whereas Kastrup states that according to idealist CP, we 'should say that the cosmos is constituted by phenomenality, as opposed to bearing phenomenality' (2018, 135), he is asserting a Humean, rather than Cartesian notion of the self. According to this view, the cosmic consciousness is constituted by phenomenal experience, in much the same way that Hume asserts that human subjects of experience are constituted by phenomenal experiences. This assertion however is independent of the dual-aspect/idealist dichotomy. I further discuss the relationship between the dual-aspect/idealist and Cartesian/Humean dichotomies below.

I utilize the following seven postulates of CP, as defined by Shani, to explore the intricacies of the theory. Shani defines the seven postulates of CP, loosely as:

1. The cosmos as a whole is the only ontological ultimate there is, and it is conscious (2015, 408).

2. The cosmos as a whole is prior to its parts (priority monism) (Ibid).

3. The cosmic consciousness (or 'absolute') has a concealed and revealed side. The concealed side is the 'intrinsic dynamic domain of creative activity', and the revealed side is the 'outer, observable expression of that activity' (Ibid, 410). This is termed the 'lateral duality principle'.

4. The absolute can be likened to a vast ocean of consciousness.

5. Cosmic consciousness is like a vacuum in quantum field theory. It is the background against which local interference patterns are discerned as phenomenal states.

6. Individual entities are dynamic constructions within the absolute.

7. The relationship between individual entities and the absolute can be likened to aquatic metaphors of the relationship between vortices within the ocean and the ocean itself (My list, derived from Shani, 2015).

By stating that 'the cosmos as a whole is the only ontological ultimate there is, and… it is conscious' (Shani, 2015, 408), Shani provides an inverse of constitutive panpsychism. This move inverts the bottom-up approach of panpsychism with a top-down approach, thereby seeking to bypass the combination problem. However, the reverse of the problem, which Chalmers terms

the 'constitution problem' (2019), arises and must be addressed. The constitution problem is the problem of 'how cosmic experiences can constitute the ordinary macroexperiences of subjects like us' (ibid, 21). A discussion of the constitution problem follows below, but for now it suffices to note that the inverse of the combination problem is an obstacle that both dual-aspect-and idealist- CP must overcome.

In addition to replacing the micro with the cosmic, CP replaces priority pluralism with priority monism by asserting that the fundamental existence is singular and unitary (Shani, 2015, 410). Priority monism states that the single cosmic subject is the *primary* entity in the universe, but it not the *only* entity in the universe (ibid).[18] As such, CP allows for the existence of micro- and macro- subjects, but specifies that they are grounded by the fundamental, ontological cosmic consciousness. This forms the second postulate of CP - priority monism (ibid).

It is worth noting an unstated assumption regarding priority (token) monism in relation to priority (token) atomism or pluralism. It is generally assumed that a bottom-up approach is necessarily atomistic, while a top-down approach is necessarily monistic. For example, Shani & Keppler state that:

> A major trigger for the rise of interest in cosmopsychism is the hope that a holistic [or monistic], top-down, substantiation of macro-level experience will prove a more viable option than an atomistic, bottom-up constitution. (Shani & Keppler, 2018, 392)

I concur that a bottom-up approach is inherently atomistic, as there would need to be multiple micro-level entities that combine to create a macro-level entity. A single micro-level entity would not have anything to combine with, so a monistic micro-level entity is incoherent (unless one accepts that the macro-level entity is *identical with* the micro-level entity, but since macro-level entities are not identical with each other, this is a problematic assertion). However, I do not believe that a top-down approach is necessarily holistic or monistic. A top-down approach to physical entities could consistently state that an atom is a part of a marble, without stating that there is only one marble in existence. As such, I believe that the unstated assumption that a top-down approach is necessarily monistic is unfounded. I return to this issue in the discussion on HNM in Chapter 4 below.

[18] In contrast with *existence* monism, priority monism allows for the existence of micro- and macro-subjects, as well as micro- and macro- physical entities, but asserts that they are all grounded in a single cosmic subject.

Given the first two postulates, I argue that Shani's version of CP is necessarily Cartesian. Since the cosmos as a whole is deemed to be the sole ontological ultimate, which is prior to its parts, it logically cannot be constituted by its parts, as such parts depend on the whole for their existence. The cosmic consciousness must therefore be a substance that *has* phenomenal experience, rather than an entity which is *constituted* by phenomenal experiences.

The third postulate is the lateral duality principle. On the surface, this principle seems to align with dual-aspect CP. It states that the 'concealed side' is the inner domain and relates to the subjective experience of the cosmic subject; and the 'revealed side' is essentially the physical universe (or the 'observable expression'). However, Shani goes on to say that:

> The revealed dimension of the absolute constitutes the structural domain of observable regularities, the proper province of scientific inquiry, while the concealed dimension corresponds to an inscrutable categorical domain *which grounds this observable order* (Shani, 2015, 410– italics mine).[19]

Given that the concealed dimension (which corresponds to the mental states of the absolute) grounds the revealed side (which corresponds to the physical universe), the physical supervenes on the mental. As such, Shani's version of CP (at least as presented in 2015) is a form of idealist, rather than dual-aspect, CP[20]. Irrespective of the dual-aspect/idealist dichotomy, Shani's cosmic subject is necessarily Cartesian as per the discussion on the first two postulates above.

The remaining postulates of Shani's CP deal with how we can understand the relationship between cosmic- and macro- consciousnesses and the way in which the absolute de-combines to create individual macro-consciousnesses. Essentially, the cosmic consciousness is likened to a vast ocean of consciousness. The concealed side of cosmic consciousness is metaphorically likened to the ocean itself, while the revealed side of cosmic consciousness (which is associated with the physical universe) is metaphorically likened to the *appearance* of the ocean (Shani, 2015). As nothing exists outside of cosmic consciousness, the notion of appearance is specifically from *within* the ocean itself.

[19] It is worth noting Shani's use of the term 'dimension' throughout multiple articles. The notion of dimensions is critical to hyperdimensional neutral monism, which I introduce below.
[20] In 2018, Shani & Keppler introduce the zero point field (ZPF), which allows for both dual-aspect and idealist versions of CP (2018). More on this below.

In this metaphorical context, macro-consciousness is likened to vortices within the vast ocean. As vortices are nothing other than dynamic constructions or localizations of water, macro-consciousnesses are nothing other than dynamic construction or localizations of cosmic consciousness. As such, macro-consciousnesses exist within, and are grounded by, cosmic consciousness (ibid).

This aquatic metaphor provides a powerful tool for conceptualizing and exploring CP (Mathews, 2011). I believe that a slight modification is required to prevent a misreading of such metaphors as anti-realist. While Shani (2015), Kastrup (2014, 2017a-c, 2018), Matthews (2011) and others equate the revealed side of cosmic consciousness with the *appearance* of cosmic consciousness, I am concerned that this visualization might be misleading for a number of reasons. Firstly, it raises the question of the existence of the revealed side of cosmic consciousness in the absence of observation. If the physical world is equated with the revealed side of cosmic consciousness, and the revealed side is what cosmic consciousness *looks like*, then what happens if no one is looking? What happens if there is no one for it to *appear* for? (Kastrup, 2017c). This problem seems to unnecessarily link CP to anti-realist, subjective idealism (Frenkel, 2022). Secondly, I believe that the metaphor misses an opportunity to introduce the concept of dimensionality (which will become critical for HNM below) (Ibid).

I therefore prefer a modification whereby the revealed side of cosmic consciousness is rather analogous to the *surface* of the ocean, instead of what the ocean *looks like*. This modification removes any anti-realist (mis)conceptions, as the surface of the ocean exists in 'objective' reality and is not dependent on any observation. This modification is not a rebuttal of the appearance metaphor, but rather a clarification. In physical terms, since light is reflected off the surface of the ocean, the surface of the ocean can be said to have a *disposition* towards a certain appearance. The notion of the physical universe as the surface of an ocean of consciousness is a critical step towards HNM, which I explain below. I also believe it is a useful analogy to employ in discussions around various forms of CP (Ibid).

3.1.1 – The Various Constitution Problems for Cosmopsychism

Having explained the general postulates of CP, I turn to the various constitution problems it faces. 'Constitution problems' are similar to combination problems but address the problem in both directions – bottom-up and top-down. As such, they encompass both 'combination' and 'de-combination' problems. Specifically, the problem for CP, is that of how cosmic consciousness

can constitute macro-consciousness, or how cosmic experiences can constitute macro-experience (Chalmers, 2019).

These constitution problems for CP are loosely the inverse of those faced by micro-psychism, and can be stated as follows:

1. Subject constitution problem – How can a cosmic subject constitute macro-subjects?

2. Quality constitution problem - How do cosmic phenomenal qualities constitute macro-phenomenal qualities.

3. Structure constitution problem – How does cosmic experiential structure constitute macro-experiential structure? (ibid).

Both the quality and structure combination problems can be illustrated through the austerity hypothesis, which is similar to the palette problem as discussed above. If one assumes that the fundamental cosmic consciousness is phenomenally austere or homogenous in relation to the rich phenomenal world of macro-consciousness, then how can cosmic consciousness ground macro-consciousness? How can the qualities and structure of a rich phenomenal world supervene upon the qualities and structure of a barren one? (Shani & Keppler, 2018)

In order to respond to these problem, Shani & Keppler utilize the 'zero-point-field' (ZPF) as per stochastic electrodynamics (SED) to explain how an austere cosmic background can ground rich macro consciousness. SED 'is based on the conception that the universe is imbued with an all-pervasive electromagnetic background field' which serves 'as the origin of the quantum behavior of matter.' (ibid, 396). While a detailed discussion of SED and the ZPF is beyond the scope of this dissertation, the critical point is that there is an austere background field which grounds the rich nature of the physical universe. Shani & Keppler then take this one step further to argue that the ZPF also grounds the rich nature of macro-consciousness. They state that the ZPF is perfectly suited for playing the dual role as the carrier of both matter/energy and of consciousness. They therefore posit that the full palette of phenomenal experience is inherent in the potentiality of the ZPF (ibid).

This then relates to the 'concealed' and 'revealed' sides of cosmic consciousness as discussed earlier. The revealed side is understood as a 'vibrant pool of activity' which corresponds to the physical universe, while the concealed side is understood as a 'formless sea of consciousness or

unstructured ocean of awareness that carries an enormous range of potentially available phenomenal nuance' (ibid, 399). This phenomenal potential is the ground from which macro-conscious systems extract their states of consciousness. As such it serves as the barren palette of phenomena which grounds the qualities of macro-consciousness.

> [W]hile we take the ZPF to be phenomenally indescribably rich, its richness is implicit and in potentia. Thus, we make no assumption to the effect that the universal background field from which our experiences are ultimately derived is phenomenally affluent in the same explicit manner in which human experience may be said to be so. Instead, our approach enables us to explain how the phenomenal character of our everyday experience is grounded in cosmic consciousness without violating the letter of the austerity hypothesis. (ibid, 402)

The notion that the phenomenal richness of the cosmic ground is 'implicit and in potentia' also relates to the subject constitution problem. According to the subject constitution problem, 'one can conceive of the cosmic subject with all of its cosmic mental states without any further distinct subjects, and in particular without any macro-subjects' (Chalmers, 2019, 21-2). In other words, the cosmic subject does not entail macro-subjects.

So, while micropsychism struggles to explain how micro-subjects combine to create macro-subjects, CP struggles to explain how a single cosmic subject can de-combine to create macro-subjects. 'In essence the problem is about subjects being proper parts of other subjects (the subject-subject proper part-hood relation), hence the 'size' of the subjects in question does not matter (Miller, 2018, 141). As such, CP seems to suffer from essentially the same problem as micropsychism (ibid).

Shani attempts to resolve this problem through the introduction of 'foundational panpsychism', according to which ontological ultimates are subjects of experience, and '[t]he relation between the subjectivity of ultimates and the subjectivity of macro-phenomenal subjects … is that of… partial grounding (Shani, 2015, 403).

The notion of partial grounding is utilized as a means of bypassing the issue of entailment which is encountered under full grounding. The cosmic subject does not need to entail macro-subjects, it is argued, because macro-subjects are only *partly* grounded by the cosmic subject. The question, however, arises regarding what else macro-subjects are grounded by if they are only

partly grounded by the cosmic subject. Shani argues that macro-subjects are partly grounded by facts about the cosmic subject and partly grounded by micro-level facts (ibid).

The problem with partial grounding, however, is that CP postulates a single cosmic subject and given the paradigm of priority monism, all facts *must* be directly or indirectly grounded by the cosmic subject. If the cosmic subject can be said to have parts[21] then all facts must be grounded either by those parts or by the cosmic subject itself. As Jonathan Schaffer states, 'Monism is equivalent to the thesis that every proper part of the cosmos depends on the cosmos' (Schaffer, 2010, 42).

But if 'micro-level facts' are deemed to be part of the cosmos (what else could they be part of?), then those micro-level facts are grounded by the cosmos. As such, macro-subjects must be fully, even if indirectly, grounded by the cosmic subject. Given that macro-subjects are fully grounded by the cosmic subject, irrespective of the claim of partial grounding, Miller's critique that CP suffers from essentially the same problem as micropsychism is valid. As such, this version of CP seems untenable as it fails to successfully resolve the subject combination problem.

However, this argument is based on the presupposition that the phenomenal experiences of macro-subjects are literally constituted by the phenomenal experiences of a fundamental cosmic subject. But not all versions of CP are committed to this presupposition. Rather than a macro subject being constituted from a cosmic subject, it is conceivable that 'each subject obtains its phenomenal character by tapping directly into the universal pool of cosmic consciousness immanent to the ZPF and by extracting from it a system-specific set of correlated resonance frequencies… (Shani & Keppler, 2018, 401). As such, while the entire palette of phenomena is inherent in the ZPF, no phenomenal experience is realized in its default state. The ZPF is thus the ground for phenomenal experience, but there is no phenomenal experience associated with it in its default state (ibid).

The problem here seems to be that in eliminating the cosmic subject, CP runs the risk of eliminating cosmic phenomenology, which is the basis for CP. Given that the ZPF is described in terms of 'potential states' rather than actual states, to what extent can the ZPF and its associated states be considered phenomenal, as opposed to protophenomenal? While the entire phenomenal palette may be immanent in the ZPF, if this palette is implicit and in

[21] Hence priority, rather than existence monism.

potentia, then it is not yet realized in its dormant state. If, as Shani & Keppler state, 'no ordinary concrete experience can be read into the ZPF in its default state…' (ibid), one is left wondering whether *any* experience can be read into it. And if no experience can be read into it, to what extent can it be considered phenomenal? In an effort to avoid the subject constitution problem, CP may thus collapse into a form of neutral monism or panprotopsychism.

In response to this problem, Shani argues that while the cosmic consciousness does not have any phenomenal experience, it does have 'ipseity' which is understood as an implicit sense of self.

> …every perspective has a point of origin which is the position from which it casts its unique angle on reality. In the phenomenological literature this conscious point of origin is identified as ipseity, or I-ness, by which is meant an implicit sense of self which serves as the dative (or the indirect object) of experience, namely, as that to whom things are given, or disclosed, from a perspective … Cosmopsychism, however, takes a step further in that it holds that the ultimate source of the implicit sense of self which lies at the basis of each relative perspective is the absolute's own core-selfhood. (Shani, 2015, 426)

But given that the ipseity of the cosmic consciousness grounds the ipseity of macro consciousness, it seems that we, once again, return to the constitution problem. How does the ipseity of the cosmic consciousness constitute the ipseity of macro consciousness? The ZPF version of CP states that the subject constitution problem does not apply to it because the cosmic consciousness is not a subject of *actual* experience (only of experience in potentia). But how does it respond to an ipseity constitution problem, when such ipseity is not only actual, but the categorial property that defines the cosmic consciousness as a subject?

Furthermore, the notion that the 'conscious presence [is] … ready to assume ordinary qualitative tones … if the right conditions for the emergence of an individual conscious perspective materialize' (Shani & Keppler, 2018, 403), once again alludes to panprotopsychism rather than panpscychism. As such, CP seems to either suffer from the subject (or ipseity) constitution problem or collapse into a form of panprotopsychism or neutral monism. With a collapse into panprotopsychism, the *potential* for mentality may be fundamental, but mentality itself is not. This is a notion that strongly relates to both PQ and HNM, which I discuss below.

It therefore seems as though CP must either accept that it cannot resolve all aspects of the constitution problem, or it must collapse into neutral monism. I explore various aspects of neutral monism in the form of PQ in the next section. Before proceeding, however, it is worth reviewing one final possibility for resolving the cosmopsychist subject constitution problem, which I briefly covered in the section on idealism above – the analogy with Dissociative Identity Disorder.

3.1.2 – The Dissociative Identity Disorder Analogy

Kastrup provides a potential response to the subject constitution problem by referencing the reported experience and brain states of those suffering from dissociative identity disorder (DID). DID is a condition whereby a person exhibits multiple discrete centers of self-awareness called 'alters' (Barude in Kastrup, 2019). In other words, a number of seemingly distinct subjects of experience seem to be associated with a single brain or body.

Kastrup posits that the constitution of macro-subjects from the cosmic subject is analogous to the constitution of alters from a unified macro-subject. He states that dissociation in cosmic consciousness results in the formation of relative macro-subjects. Each relative macro-subject can be seen as an alter of cosmic consciousness, and each of their private qualitative fields corresponds to a specific part, or localization, of the cosmic consciousness (Kastrup, 2019).

While the individual experiences of different alters may vary in a manner similar to the differing experiences between humans, the experience of ipseity remains consistent.

> …[T]he primary sense of I-ness of all alters is that of cosmic consciousness itself; the very consciousness of the alters … is cosmic consciousness. But the particular phenomenal field of an alter, which defines its identity as a seemingly separate individual, is demarcated by a local dissociative process — analogous to DID… Naturally, because alters are fully grounded in cosmic consciousness, it is incoherent to say that they become separated from it; only an illusion of separation arises as a particular phenomenal content in the alter's dissociated qualitative field. (ibid, 142-3)

The critical point in relation to DID is that one mind *seemingly* constitutes multiple minds. And while critics may debate whether the alters in DID are *actually* separate minds, the illusion of separate minds is sufficient for the purposes of the argument. As macro-subjects are fully grounded in cosmic consciousness, we are *not actually* separate minds, but the illusion of

separation is part of our 'dissociated qualitative field'. As such, just as DID alters incorrectly believe themselves to be separate from the unified macro-consciousness, 'healthy' humans (not suffering from DID), incorrectly believe themselves to be separate from cosmic consciousness.[22]

Exactly how the dissociated alters are grounded by, and differentiated from, unified macro-consciousness is unclear. However, the point is that it happens. As such, we have empirical evidence to support the hypothesis that minds can seemingly constitute other minds, specifically through the top-down process of de-combination or fragmentation. And if that is the case, we have no reason to presume that it is logically inconsistent for a cosmic mind to seemingly constitute macro-minds. So, while we may not fully understand exactly how dissociation happens, the knowledge that it happens allows us to deduce that subject constitution is possible.

One issue with this analogy is that it assumes the fundamentality of a Cartesian self. In stating that one mind becomes many minds, the assumption is that mind is prior to experience. Under a Humean view, however, minds supervene on experience, so rather than one mind becoming multiple minds, one bundle of experiences becomes multiple bundles of experience. Of course, this corresponds nicely with the notion that one mind seemingly becomes multiple minds, but the fundamentality of mind is disputed. As such, while DID demonstrates the possibility of one mind becoming multiple minds, it is compatible with both idealism and neutral monism or panprotopsychism. It is compatible with the notion that the fundamental ontological ground is not a cosmic subject of experience, but rather a subject-less tapestry of phenomena. I revisit this possibility in the chapter on PQ below.

In addition to the problem of the supervenience relation between mind and experience, Chalmers problematizes DID as follows:

> There are many disanalogies between the universe and a DID subject, and it is not at all clear how to find analogous within-subject fragmentation at the level of cognitive processes in the universe. The view is also massively revisionary about our minds and our relations to one another. It makes our ordinary mode of existence pathological, since in this mode we are unaware of the vast majority of experiences we are having.

[22] Based on the comparison to DID, cosmic consciousness is necessarily Cartesian. It is the ground for all phenomenology. However, macro-subjects and their 'private qualitative fields' can be seen as either Cartesian or Humean. Subjects can supervene on the contents of the fields or visa versa.

> This entails a massive failure of introspection, where our ordinary beliefs reflect a near-complete lack of knowledge about our own consciousness. (Chalmers, 2019, 24)

But again, the point here is not that the cosmic consciousness *is* a DID subject, nor that the process of fragmentation is analogous. Rather, the point is that in a very specific circumstance (DID), one mind can seemingly 'fragment' into multiple minds, and so such fragmentation, or de-combination, is simply possible (or at least the illusion of fragmentation is possible, insofar as minds are composed of more fundamental experience).

Furthermore, the notion that such a theory makes our ordinary mode of existence pathological is in line with numerous mystical traditions such as Advaita Vedhanta and various forms of Buddhism. Such traditions argue that our belief in ourselves as separate subjects, distinct from the rest of the universe, is in fact, pathological. Regardless of one's philosophical leanings (with the possible exception of solipsism), it is obvious that we are part of the universe, rather than distinct from it. And yet, we tend to intuitively feel that we have a separate subjective dimension, which is distinct from the objective universe. This intuition can certainly be labeled pathological, so a theory that purports that our ordinary mode of existence is pathological, is at the very least conceivably consistent.

Furthermore, our lack of awareness of the vast experiences of the cosmic consciousness from which we are dissociated is not a massive failure of introspection, but rather the nature of dissociation. Dissociation 'carves out private phenomenal fields such that alters must become blind to all phenomenality taking place outside their respective field, which then explains why I cannot read your thoughts' (Kastrup, 2018, 143). Macro subjects are thus unified and bound dissociations of cosmic consciousness, without access to experiences outside of their dissociative boundaries.

Based on the arguments above, I argue that CP is a consistent response to the mind-body problem. The critical steps are then to explain *how* cosmic consciousness constitutes macro-consciousness, and to prevent CP from collapsing into a form of neutral monism. Kastrup's DID analogy demonstrates that fragmentation is possible, but exactly how phenomenal fragmentation happens is not yet clear. Nor is it clear that such fragmentation is situated within an idealist or panpsychist framework as opposed to a neutral monist or panprotopsychist framework.

In order to both clarify and challenge the process of fragmentation or de-combination, I introduce the concept of dimensionality in relation to HNM in Chapter 4 below. First, however, I turn to a detailed analysis of PQ, which will also serve to form the foundations for HNM.

3.2 – Panqualityism

Panqualityism (PQ) is a form of neutral monism which posits that the fundamental ontological ultimates are 'unexperienced qualities' or 'phenomenally qualitied ultimates' (Coleman, 2012). These unexperienced qualities are neither mental nor physical but are the ground for both the mental and physical.

PQ seeks to resolve the subject combination problem by 'deflating the subject' (Chalmers, 2019), such that subjects are deemed to be compositional entities rather than ontological primaries. According to PQ (and all forms of subject deflationism) there is a tacit background presupposition in the subject combination problem that subjects are metaphysically primitive entities, and this presupposition poses a false problem for combinatorial panpsychism (Chalmers, 2017). By assuming that phenomenal ultimates are micro-subjects and that micro-subjects aggregate to form macro-subjects, panpsychists expose themselves to the subject combination problem. However, if phenomenal ultimates are deemed to be non-subjects that assemble in myriad (not only aggregative) ways, the subject combination problem can be bypassed (Coleman, 2014).

As a form of neutral monism PQ must respond to the questions posed for neutral monism in general as stated above. Namely:

1. What are the [neutral] ultimates and what is their nature?
2. What is the relationship of these ultimates to matter?
3. What is the relationship of these ultimates to mind?
4. What is the seeming relationship of mind to matter?

Regarding question 1, Coleman states that '…the world is ultimately constituted of quality-instances, where we can usefully think of these as unexperienced qualia—properties just like the qualia we experience, only without anyone experiencing them' (2016, 1). As the fundamental ultimates, these unexperienced qualities then ground both the physical and the

mental. For example, the 'blue-ness of blue' is a fundamental quality which grounds both the physical quality of blue-ness as well as the conscious experience of blue-ness. 'Just as the sky's blueness or a fire-engine's redness persist when no-one is around to see them … so the qualities of the ultimates persist whether or not any subject is aware of them' (Coleman, 2014, 31).

The relationship between these unexperienced qualities and matter (question 2) is similar to that proposed by naïve realists. According to this view, the blue-ness of blue really exists in the objective physical world just as we perceive it. As such, physical blue-ness is the physical manifestation of the 'neutral' quality of blue-ness. Matter, then, can be seen as the physical manifestation of unexperienced phenomenal qualities.

The relationship to mind (question 3) requires an additional element as the ultimate qualities are, by definition, unexperienced. And since they are unexperienced, how could they possibly constitute conscious experience? In order to account for conscious experience, Coleman argues that the *functional relationships* between qualia (or unexperienced qualities) constitute awareness, and such awareness is equivalent to consciousness.

> …unexperienced qualities permeate basic matter. Certain portions of matter exhibit a configuration which provides for awareness of the qualities they bear: matter, when specially arranged, can apprehend its own quality, in effect. This is consciousness (Coleman, 2014, 29-30).

Accordingly, it is thus the *awareness* of qualities which constitutes consciousness. As phenomenal qualities do not have to be experienced in order to exist, *awareness* is not a fundamental aspect of these qualities, but rather a functional relationship between qualities. As such, qualities need to be specifically arranged to create awareness of themselves, and such awareness is equivalent to consciousness, which is equated with 'the subjective presence to one of qualities' (Coleman, 2016, 45).

However, this raises the question of where 'subjective presence' or 'one' (the subject of experience) come from. This then moves the critique from a quality/awareness gap to a quality/subject or quality/subjective presence gap. One way or another, there seems to be an epistemic gap between unexperienced qualities (including their functional relationships) and awareness, consciousness, or subjectivity. We could conceive of a group of qualities being arranged identically to how they are arranged in our universe, with the same functional

relationships, but with the absence of awareness. In other words, PQ zombies appear to be conceivable, so awareness cannot be reducible to functional relationships of unexperienced qualities. 'For any set of instantiated qualities and physical properties it is conceivable that all those qualities and properties are instantiated without any awareness of qualities (Chalmers, 2017, 43). In other words, there is no conceivable arrangement of qualities which necessitates awareness of qualities. I return to this problem, and other related problems below.

In terms of question 4 - the seeming relationship between mind and matter - as with all forms of neutral monism, mind and matter correspond with each other as they both supervene upon the neutral ultimates, but this *correspondence* does not necessarily involve *causation.* As stated above in the section on neutral monism, causation between mind and body reduces to causal, functional relations among ultimates (Stubenberg, 2016).

As brains are constituted from neutral qualities, '[s]uch qualities are physical when they play physical/chemical/biological roles in the brain, and mental when they provide the content that appears in consciousness' (Coleman, 2017, 6). In and of themselves, unexperienced qualities are neither mental nor physical. But the mental and physical relate to each other, such that 'when you are conscious of a colour that is also playing a physical role (as, say, a constituent of a physical object), the colour counts as simultaneously physical and mental' (ibid, 6).

3.2.1 – The various combination problems for PQ

According to Chalmers:

> PQ (like other forms of panprotopsychism) has the advantage that it has no microsubjects at the basic level, so it avoids James's subject-summing problem. Still, as the view stands, it seems to leave all three main strands of the combination problem open. It is unclear how microqualities can constitute a macrosubject, or how they can constitute macro-qualities, or how they can constitute the structure of macroexperience. One needs one of the other solutions to handle each of these issues. (Chalmers, 2017a, 27)

PQ can be seen largely as a response to the subject combination problem for panpsychists. Coleman states that 'since minds (subjects) are fenced off from one another, they cannot combine. You cannot mix or pool minds to create a larger mind, no matter how closely you bind

them together: not even when they are arranged into the structure of a brain' (Coleman, 2012, 11).

Given that the most pressing issue for panpsychism is the seeming incoherence of combining subjects, why not eliminate subjects from the fundamental base, and posit that the base is rather comprised of non-subjective experience or qualities?

One of the main advantages of PQ in relation to panpsychism is that it does not rely on the fundamentality of (combining) subjects and is therefore not affected by the subject constitution problem. Panpsychists assume that phenomenal ultimates must themselves be subjects of experience and, as a result of this assumption, they assume that phenomenal assembly can only be aggregative (ibid). As aggregative combination of subjects seems to be impossible, panpsychism is necessarily prone to the subject combination problem.

The problem with the combination of subjects is due to the perspectival nature of subjects.

> That a given subject has a particular phenomenological point of view can be taken as saying that there exists a discrete 'sphere' of conscious-experiential goings-on corresponding to this subject, … A subject, then, can be thought of as a point of view annexed to a private qualitative field (Coleman, 2014, 15-16).

The 'private qualitative field' can be seen as the phenomenal contents of consciousness. It is the unexperienced qualities that constitute the content of experience. The point of view, however, is not combinable as it consists of both inclusive and exclusive elements. In other words, the point of view that includes redness to the exclusion of all else, cannot combine with the point of view that includes blueness to the exclusion of all else, as such combination would be contradictory.

The contents of consciousness (qualities) are therefore combinable, but points of view are not. So, why not drop points of view from the fundamental ontological ground? In other words, if subjects are not combinable, then why not posit non-subjective neutral ultimates, which combine to create subjects of experience?

> Panpsychists are plausibly correct in holding that qualia—the qualitative properties we find in experience—are irreducible, and so … fundamental. Where they err is in attaching subjectivity essentially to qualia: the notion that there must exist 'someone' to

> experience any given quale. Making the ultimates little subjects blocks them from being able to constitute a macro-subject. The moral of this failure is that qualia must be divorced from subjectivity—the awareness of qualia by subjects (Coleman, 2012, 29).

By divorcing qualia and subjectivity, PQ bypasses the subject combination problem. As unexperienced qualia are taken to be the ontological ground, only they are required to combine to create macro-subjects. There is simply no need for awareness, subjects or points of view to combine, so the problem is averted.

The issues with this assertion are two-fold. The first is that the existence of phenomenal qualities independent of the existence of subjects of experience is controversial and arguably incoherent. Secondly, as noted above, this move opens up the possibility of a quality/awareness gap, which notes that no functional arrangement of qualities necessitates awareness. I discuss both of these concerns below. For now, however, I accept that the omission of subjects at the ontological level bypasses the subject combination problem.

PQ is also subject to other aspects of the combination problem, such as the structure combination problem and the quality combination problem. The structure combination problem for PQ is that 'the structure among qualities instantiated in the brain is very different from the structure among qualities of which we are aware, and it is hard to see how the former could constitute the latter' (Chalmers, 2015, 29). And the quality combination problem can be illustrated through the palette problem, which is that 'it is hard to see how a few primitive qualities … could yield the vast array of qualities of which we are aware' (Ibid, 29-30).

The quality combination problem is clearly still relevant for PQ. In fact, the quality combination problem becomes central as PQ replaces subjects with qualities. In a sense, by deflating subjects such that they are constituted by *qualities* rather than *subjects*, Coleman replaces the primacy of the subject combination problem with that of the quality combination problem.

Coleman addresses the quality combination problem by likening the combination of qualities to the combination of painted patches within a painting. [W]e understand the composition of a painting by thinking about the various painted patches filling the canvas: we consider their qualities in isolation, and see how, by assembling the qualitative patches, we obtain the complete image' (Coleman, 2014, 10). He explains various means of combining paint patches, such as mixing, overlapping, or placing them side by side (Coleman, 2012). It is clear that in the

case of placing paint patches (or pixels) side by side, the patches are not qualitatively interacting with each other, and yet '[e]ach contributes to the overall qualitative impact of the canvass, and they may affect each other without having to mix' (ibid, 22).

Given these three means of blending paint patches, we see that a vast array of macro-qualities are, in fact, reducible to a few primitive qualities. This notion can also work the other way around, in a monistic (or top-down) framing of PQ. From this perspective, the quality combination problem relates to the austerity hypothesis faced by CP. Just an austere cosmic subject can give rise to rich macro-subjects under CP (Shani, 2015), an austere monistic quality (or tapestry of qualities) can give rise to rich macro-qualities. I further explore this possibility in relation to the structure combination problem for PQ below.

While this resolves the issue of how a few primitive qualities (or a single, austere, cosmic quality) could yield a vast array of macro-qualities, it still leaves open the question of how we are *aware of those qualities.* While paint patches may be able to combine to create a complex painting, the question still arises as to where the observer of the painting comes from. As such, while PQ seems to resolve the quality combination problem, it still faces a quality/awareness gap, which questions how we become aware of the complex combination of qualities.

The structure combination pertains to the relationship between the structure of the brain and the structure among qualities of which we are aware. Given that these structures are radically different, how could the structure of the brain constitute the structure of qualities of which we are aware?

In addressing the issue of structure, Coleman states that it is 'the essentially structured … nature of the phenomenally-qualitied systems posited that enables them to be subjects of their own phenomenal qualities, something beyond the reach of simple ultimates' (Coleman, 2012, 24). But what is this structure? And why do the physical and phenomenal structures differ so radically?

The distinction between qualities and awareness of qualities is critical here. Coleman states that 'The panqualityist has one job explaining how microqualities combine, and a separate task to account for consciousness of qualities, plus the unity and boundaries of macro-consciousness….' (Coleman, 2016, 25). Given that qualities and awareness of qualities are separate with separate explanations, there is seemingly no problem if the structure of a brain doesn't isomorphically

align with the structure of experience (ibid). As awareness is more than the combination of qualities, awareness and qualities do not need to have an isomorphic relationship with each other, or with the structure of the brain.

This non-isomorphic relationship can also be seen through an alternative, monistic approach to PQ. Up to this point, I have assumed a token pluralist version of PQ – there are a number of different qualities, and these qualities combine to create both the physical universe, as well as the contents of conscious experience. However, Coleman also notes the possibility of a monist version, whereby there is a single, monistic, tapestry of qualities, and this tapestry grounds both the (monistic) physical universe as well as the contents of consciousness.

> The universe could be conceived of as an enormous enqualitied fabric, with each quality instance being deeply related and entwined with all the others. The quality of a given co-ordinate in that web to some extent supervenes on what qualities are present at all the other co-ordinates, so yielding a massively holistic qualitative universe. (Coleman, 2016, 24)

Given a holistic entangled quantum universe, all aspects of the universe correspond to, or are entangled with, all other aspects of the universe. As a result, there is a one-to-many or one-to-all relationship between individual qualities and the universe as a whole. Again, this seems to indicate a non-isomorphic relationship between various aspects of the universe, so the non-isomorphic relationship between the structure of the brain and the structure of awareness becomes far less salient.

The notion of a non-isomorphic relationship between consciousness (or awareness) and the brain is a critical aspect of HNM, and I return to it in the section on HNM below.

3.2.2 - Un-resolved criticisms

As stated above, there are a number of criticisms of PQ that are not specifically related to the combination problem. These problems can be understood primarily as (1) the conceivability of PQ zombies and the quality awareness gap, and (2) the problem of the existence of qualia independent of, or prior to, subjects of experience that ‘have’ these qualia. I argue that the existence of such independent qualia is coherent, but the quality/awareness gap is a serious problem for PQ, analogous to the wide variety of explanatory gaps faced by other monistic theories.

Chalmers describes the quality/awareness gap as follows:

> … no instantiations of qualities ever necessitate awareness of qualities. Or in the key of conceivability: for any set of instantiated qualities and physical properties, it is conceivable that all those qualities and properties are instantiated without any awareness of the qualities. … And even if only some phenomenal properties involve awareness of qualities, this will be enough to make the case against constitutive panqualityism. (Chalmers, 2015, 29)

While PQ does not involve fundamental subjects of experience combining to form macro-subjects of experience, it does involve fundamental qualia combining in certain ways to create awareness of the qualia. To use an example from Goff's critique of panpsychism, we could imagine the qualia of coldness, tiredness, and roast beef smelling-ness combining, but doing so in the absence of awareness of these qualia (Goff, 2009). These zombies would have a correlation with the *contents* of our consciousness, but unlike us, they would not be *aware* of these contents. PQ zombies appear to be conceivable and therefore possible.

The quality/awareness gap can be exposed through Coleman's description of awareness. He describes awareness as lacking in phenomenology, and thus differentiates it from the unexperienced phenomenal ultimates:

> That awareness might lack phenomenology doesn't appear terribly surprising, when considered as a general matter: It is via awareness that we encounter sensory qualities and the appearances of things, but why should the faculty that presents sensory qualities to us itself make some appearance among our sensory qualities? That would be akin to the camera appearing in the periphery of every shot of a television show. (Coleman, 2016, 42-3)

The problem with this analogy, however, is that a camera is completely distinct from every shot on a TV show as well as from the pixels on a TV screen. As Coleman argues that awareness is the functional relationship between unexperienced qualia, the analogy would be like arguing that a camera is identical to the functional relationship between shots on a TV show or pixels on a TV screen. As awareness has been omitted at the fundamental level (largely to bypass the combination problem), a gap presents itself in trying to sneak awareness back in.

Similarly, Coleman employs the metaphor of a searchlight, shining awareness on the pre-existing qualities. The idea is that the qualities constitute the contents of consciousness, but these contents go unexperienced until the light of awareness 'discloses' them (Coleman, 2014). But just like with the TV camera analogy, this metaphorical searchlight is not equivalent to the functional relationship between the entities it illuminates. Rather, it is a completely separate existence, which stands completely outside of that which it illuminates. As Shani states in his critique of PQ,

> A searchlight sweeping the night landscape illumines certain portions of the nearby terrain but it cannot reveal a single fact about the surroundings unless someone (some sentient being) is situated behind the instrument, at the receiving end of things, and experiences the disclosed scenery. (Shani, 2021, 21).

As such, it seems that awareness, or consciousness, cannot be derived from the functional relationships of non-aware or non-conscious ultimates.

The dialectic between qualities and awareness results in an apparent paradox, as unexperienced qualities are 'both sufficient and insufficient for experience: sufficient in respect of the qualitative component of experience; insufficient in respect of the subjective component' (ibid, 13). The problem here is that of how qualities which necessitate no experience could possibly constitute the subjective character of experience (ibid). It seems clear that no functional relationship between non-experiential entities could possibly create experience. As such, PQ seems to face a fairly dire critique similar to that of physicalist functionalism as discussed above.

The second unresolved problem for PQ seems to be less intractable. This is the problem of the existence of unexperienced qualia. As stated above, Coleman likens unexperienced qualia to the unexperienced red-ness of red or blue-ness of blue. While critics may contend that red-ness is nothing other than a specific wavelength of light, such a contention assumes a physicalist ontology. It assumes that the physical properties of light are fundamental, and that the qualitative properties of colour supervene on the physical. But this is the point in question, and the PQ assertion that physical properties supervene on qualitative properties is coherent, even if counter-intuitive.

However, another problem arises in relation to the use of colour as demonstrative of the existence of phenomenal qualities independent of subjects. While it may be conceivable that

blue-ness exists independently of subjects, is it equally conceivable that affective qualities exist independently of subjects? 'Might the phenomenal qualities constituting a sensation of itchiness, a feeling of joy, or a sombre mood exist wholly unexperienced? (ibid, 13)

> We can imagine a world adorned with unexperienced colours — and perhaps with greater difficulty, unexperienced sounds and scents. But can we imagine a world populated with unexperienced tactile or proprioceptive phenomenal qualities, let alone the phenomenal qualities constitutive of affects, sensations, or moods? (ibid, 14)

In response to this problem, it is firstly important to note that PQ is not committed to the view that itchiness, joy, or a sombre mood are fundamental. Rather, PQ states that these types of experiences are complex compositions of fundamental qualities, including their functional relationships or awareness of such qualities. I discuss what type of unexperienced fundamental qualities could possibly constitute the complex quality of itchiness below.

Furthermore, panqualityists would likely accept that *some complex* phenomenal experiences, do in fact, require a subject of experience to have them. The redness of red may exist independently of a subject, as do the constitutive qualities of itchiness. But itchiness itself requires a subject, as the particular qualities that constitute itchiness only combine in the context of a subject of experience. So unexperienced itchiness does not exist because itchiness does not exist at the fundamental level of unexperienced qualia.

But then what are the fundamental qualities that constitute itchiness, which can exist independently of a subject? One answer to this can be found in Morch's understanding of phenomenal powers. Mørch argues that phenomenal properties are 'intrinsically powerful', meaning that they produce their physical effects solely in virtue of their intrinsic, phenomenal character (Mørch, 2017).

> [T]he view takes the intrinsic character of phenomenal properties to consist in their phenomenal, qualitative character, i.e., what it is like or how it feels for a subject to experience them. According to the view, then, pain makes subjects who experience it try to avoid it simply in virtue of feeling bad, and pleasure makes subjects try to pursue it simply in virtue of feeling good. (ibid, 16)

While Mørch references subjects and subjective experience ('what it is like or how it feels') in this theory, it is perfectly consistent with a non-subject involving view, such as PQ. The critical

point is that phenomenal properties are intrinsically powerful. Upon this view, the objective physical facts of repulsion or attraction, for example, are ultimately grounded in the unexperienced hedonic qualia relating to repulsion or attraction, namely unexperienced pain or unexperienced pleasure. So, physical repulsion is then grounded by unexperienced pain and physical attraction is grounded by unexperienced pleasure. In this way, unexperienced affective qualia seems perfectly conceivable.

This relates to the Russellian notion that physics tells us the dispositional, rather than categorical, properties of matter:

> it turns out upon reflection—at least according to Russellian monism—that physical science is confined to telling us about the behavioural dispositions of physical entities.… Physics tells us that an electron has mass and negative charge, among other properties. How does physics characterize these properties? Mass is characterized in terms of gravitational attraction and resistance to acceleration. Charge is characterized in terms of attraction and repulsion. All of these characterizations concern how the electron is disposed to behave, and the same is true with respect to the ways in which physics characterizes other physical properties. Physics is silent on the features of matter that underlie its behavioural dispositions, generally referred to as the 'categorical properties' of matter. (Coleman & Goff, 2020, 301-2)

However, in contrast to panpsychism, PQ disputes the claim that 'categorical properties' are fundamental properties of matter. Rather, it states that the categorical properties are neutral, and that these neutral properties underly the behavioural dispositions of both mind and matter.

Given this understanding, the constituents of affective experience can, in fact, exist separate from, and prior to, subjects of experience. On this view, the repulsion between electrons is the physical manifestation of neutral elements, in the same way that phenomenal repulsion (i.e., disgust) is the phenomenal manifestation of neutral elements. And just as the ground for physical repulsion can exist without subjects of experience, so can the ground for phenomenal repulsion. In fact, they are both grounded (at least partially) in the same fundamental, neutral categorical quality of repulsion.

In this way, itchiness or a sour mood can be seen as a complex combination of both unexperienced affective qualia and unexperienced qualia more directly related to sensory

experience, such as colour qualia or sound qualia. In other words, itchiness is the complex combination of unexperienced hedonic qualia and unexperienced tactile qualia, which is why we could say that itchiness is an 'unpleasant sensation'. (Of course, the problem of *awareness* of the combination of these qualia is still a serious issue for PQ.)

Alternatively, as stated above, PQ can be viewed through a monistic lens, in which case the universe can be seen as a holistic enqualitied tapestry. Under this version, itchiness for example, is not the combination of unexperienced tactile and hedonic micro-qualia, but rather the de-combination (or constitution) of the enqualitied tapestry. Either way, itchiness has both sensory and hedonic qualities, but in the pluralist version, such fundamental qualities are non-aggregately combined, whereas in the monistic version, such qualities are derived from the fundamental tapestry.

This monistic version of PQ has a strong relationship to CP, which I discuss in the following section on the relationship between the two theories.

3.3 – On the Relationship Between CP & PQ – Charting the Way Forward

Having explored both CP and PQ in detail, I briefly turn to the relationship between them, to set the tone for the introduction of HNM in Chapter 4.

One of the most obvious points of comparison between CP & PQ is regarding the pluralism/monism dichotomies. Both theories are *type* monist, in that they both posit one fundamental type of substance or existence. CP posits that the fundamental 'stuff' is mental, while PQ posits that it is neutral.

While both theories are, by definition, type monist, they differ regarding *token* pluralism or monism. CP is necessarily token priority monist – there is one cosmic consciousness, and all parts supervene upon this single holistic entity. PQ is compatible with both token priority monism and token priority pluralism – there can be a plurality of phenomenally qualitied ultimates which combine to create macro-qualities and awareness of such qualities (through their functional relationships); or there can be a single holistic enqualitied tapestry which constitutes (or de-combines to create) macro-qualities and awareness of such qualities (again,

through functional relationships). In order to compare like-theories, I discuss the relationship between CP (which is inherently token-monist) and token-monist PQ.

Returning to type monism, the critical difference between CP and PQ is that CP posits mentality as fundamental, whereas PQ posits unexperienced neutral qualities as fundamental. Interestingly, both theories face problems as a result of their differing claims – these problems then serve to highlight some of the universal problems pertaining to any mind-body theory and the assumptions that underly the problem in the first place.

By starting with consciousness as fundamental, CP bypasses the need for strong emergence. However, by starting with consciousness as fundamental, it faces the subject constitution problem. And while Kastrup's analogy with DID may demonstrate that one subject can seemingly become multiple subjects, it does so in a way which does not differentiate it from monistic PQ. The fact that one subject seemingly becomes multiple subjects may be a result of one unified and bound grouping of phenomenally qualitied ultimates becoming multiple unified and bound groups of phenomenally qualitied ultimates. So, the subject constitution problem remains.

Contrastingly, by starting with neutral ultimates as fundamental, PQ bypasses the subject constitution problem, but faces the problem of strong emergence. By positing neutral ultimates as fundamental, subjects do not need to constitute other subjects, but consciousness itself must then emerge from the functional relationship between neutral ultimates. And as no functional arrangement of enqualitied ultimates necessitates awareness of such ultimates, strong emergence is required. So, the quality/awareness gap remains.

These problems can also be understood through the relationship between ipseity (as per CP) and awareness (as per PQ). Ipseity is independent of, and prior to, phenomenal qualities, whereas awareness supervenes on the functional arrangement of phenomenal qualities. As ipseity is linked to the default state of the ZPF, it exists prior to any disturbances of the ZPF, which are equated with phenomenal experience. Again, the problem arises of how cosmic ipseity can constitute macro-ipseity. In contrast, awareness is dependent upon the functional relationships of phenomenal qualities. But as these qualities are unexperienced and have no subjective dimensions to them, awareness must be strongly emergent, and so the quality/awareness gap remains.

So, again we see that by starting with the critical aspect of subjectivity (ipseity), CP faces a constitution problem; and by generating the critical aspect of subjectivity (awareness), PQ faces an explanatory gap.

These problems seem to apply to all monistic philosophies of mind. Physicalism faces an explanatory gap because it starts with non-conscious entities and must generate consciousness from them; Panpsychism faces various combination problems because it starts with fundamental conscious entities (micro- or cosmic) and must derive macro-consciousness from them; Idealism also faces various combination problems because it starts with fundamental conscious entities and must derive both the physical universe and macro-consciousness from them; Neutral monism faces an explanatory gap because it starts with neutral entities and must generate both the physical universe and consciousness from them.

Given that all philosophies of mind face seemingly insurmountable tasks, it is worth asking if there are any underlying assumptions which are common to all current philosophies, that might underly the common problems. *I argue that the problematic underlying assumption common to all theories of consciousness is that consciousness must necessarily be a substance, entity, process or event, either fundamental or constitutional* (including functional relationships). This notion spans the spectrum from bottom-up physicalism, whereby consciousness is constituted from fundamental physical entities (such as quarks, atoms, or strings) to idealist CP whereby consciousness is attributed to a monistic cosmic idealist subject. In either extreme, and in all theories along the spectrum, consciousness is equated with a substance or event (in the broadest senses of the terms), rather than a 'space' of sorts, within which mental events occur. This assumption can be likened to focusing *exclusively* on matter and energy to resolve physical questions, rather than addressing matter and energy within the broader context of spacetime.

In the following chapter, I introduce the possibility that *dimensionality* is critical to resolving the mind-body problem. Perhaps by engaging with such dimensionality as the 'space' within which mental events occur, some explanatory gaps will be bridged. Specifically, I will argue that the physical world of spacetime is a hypo-dimensional aspect of a more-than-4-dimensional universe, and that consciousness is the protrusion of spacetime into the 'depths' of such a multi-dimensional universe (Frenkel, 2022).

Chapter 4 – Hyperdimensional Neutral Monism[23]

4.1 Prelude

Before I introduce the concepts behind HNM, I believe it is worthwhile to recount my (flawed) thought process from when I was a teenager learning about the dimensions of spacetime. This re-counting should not be seen as a validation of any theory at all, but rather a brief description of the thought process that led me to engage with the possibility that dimensionality is relevant to consciousness. I ask the reader to withhold any judgement until I have had the opportunity to fully explain the relevant philosophical idea.

In high school I was taught that the universe consists of four dimensions – three spatial dimensions and one temporal dimension, or four dimensions of spacetime as per Einstein's theory of relativity. I learned that if we understood the position and velocity of every particle in the four dimensions of spacetime, we would know everything there was to know about the universe. But this struck me as incomplete. It seemed similar to arguing that if we knew the position and velocity of every pixel on a screen, we would know everything there is to know about the moving image on the screen. But I asked myself, what about colour? If we knew the position and velocity of every particle on the screen, we would perfectly describe a dynamic black and white image but would not describe its colour. So, it seemed to me at the time, that the universe must have more than 4 dimensions of spacetime – it must also have a colour dimension.

Upon voicing this concern, I learned that colour *can* in fact, be described in the four dimensions of spacetime. Colour is simply the human perception of different wavelengths of light, and wavelengths of light can be simply described in the four dimensions of spacetime. This explanation made sense to me, and I accepted that no additional dimensions are required to explain colour. However, 25 years later, when I first read about the hard problem of consciousness, it occurred to me that additional dimensions may be relevant in explaining consciousness, as the four dimensions of spacetime are arguably insufficient.

I revisit how additional dimensions can be related to consciousness, and how we can understand these additional dimensions below. First, however, it is important to address the

[23] Most of this chapter has been adopted from Frenkel, 2022. Thank you to Philosophia for allowing me to re-use much of this article in this dissertation

cost of these extra dimensions to our understanding of the universe. I accept that the cost of *adding* dimensions to address the mind-body problem would be problematic and would likely disqualify my thinking from serious consideration on the grounds of parsimony. However, string theory already posits the existence of multiple dimensions 'beyond' those of spacetime. There are numerous versions of string theory, but all of them require a minimum of 10 dimensions (some require 11, 26 or 27 dimensions). As such, I am not *adding* any extra dimensions, but rather *reframing* extra dimensions which are already thought to exist.

These extra dimensions are generally thought to be beyond the capacity for human understanding and none of these dimensions have ever been detected by experiment. There are many thought experiments and visualization tools to help us imagine them, but none of these tools allow us to directly engage with or directly understand them. So, it seems to me, that on the one hand, string theory has additional dimensions that it cannot explain or detect, and the hard problem consciousness could possibly be resolved (or at least addressed) by utilizing additional dimensions. What if the additional dimensions posited by string theory have some relationship to the mystery of consciousness? This is the question which I explore throughout the remainder of this dissertation.

4.2 – Definitions and Conceptual Frameworks

Hyperdimensional neutral monism (HNM) concurs with neutral monism in general, that there is a single type of ontologically primary ultimate, which both the physical and the mental supervene on. But HNM expands on this concept by defining the physical world of spacetime as a 4-dimensional aspect of an 'ocean' comprised of these ultimates, and the mental as the protrusion of the physical world of spacetime into the hyperdimensional realm.

I utilize the term 'dimension' in the literal sense in which space and time are considered dimensions[24]. According to the scientific theory of general relativity and the metaphysical theory of physicalism, the universe consists of the four dimensions of spacetime, which can be understood as length, width, depth (or height), and time. In contrast to general relativity, and somewhat in line with string theory, I posit that the universe consists of more than four

[24] This contrasts with its usage in dimensional analysis, whereby 'dimensions' refers to base quantities such as length, mass, temperature, charge, etc.

dimensions, and that the physical world of spacetime is the 4-dimensional aspect or abstract 'surface' of this realm (more on surfaces below). I utilize the term 'realm' to refer to that which is defined by multiple *types of* dimensions, such as the realm of spacetime, which is defined by both spatial and temporal dimensions.

The concept of surfaces as hypodimensional aspects of hyperdimensional realms is illustrated in figures 1 and 2 below. Figure 1 shows a 3-dimensional cube with a 2-dimensional surface. The cube has length (x-axis), width (y-axis) and depth (z-axis), whereas the surface has length (x) and width (y) only. The surface is a 2-dimensional aspect of a 3-dimensional cube. The surface lacks any depth (or 3-dimensionality).

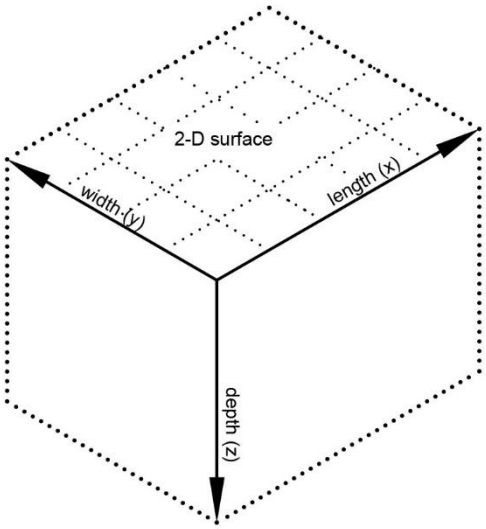

Fig 1 3D cube with 2D surface

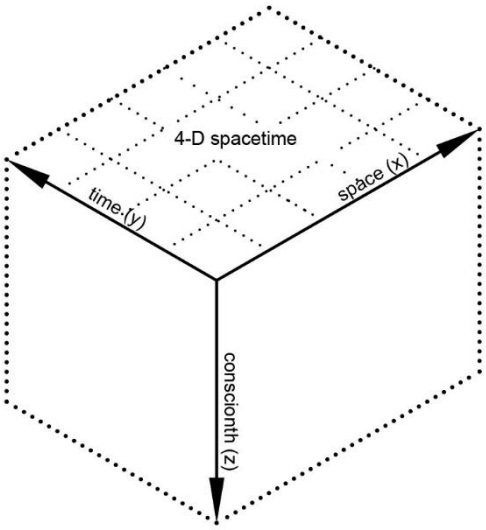

Fig 2 >4D cube with 4D surface

Figure 2 shows a similar diagram, but the three spatial dimensions of length, width and depth have been compactified into a single dimension of 'space' on the x axis. The y-axis represents time. The z-axis represents a dimension orthogonal to the plane of spacetime, and for this axis I introduce the term 'consciounth'. 'Consciounth' is derived from a combination of the word 'conscious' with the 'consonant-th' as found at the end of the terms 'lenGTH', 'wiDTH' and 'dePTH'. I introduce this term as HNM asserts dimensions 'beyond spacetime', which are neither spatial nor temporal in nature. Rather, these 'extra' dimensions relate to consciousness (more on this below).

The surface of the cube in figure 2 can be said to be a 4-dimensional aspect of a more-than-4-dimensional realm and is associated with the physical world of spacetime. This surface lacks any

'consciounth' (or more-than-4-dimensionality). It should be noted that while the term 'consciounth' is derived from 'length', 'width', or 'depth', it is more comparable to that of 'space', as it may contain additional dimensions within it (just as space contains length, width, and depth).

I utilize the term 'existence' or 'existences' in the broadest sense of the term to refer to 'that which exists'. I specifically use 'existences' in place of terms like 'entities', 'objects' or 'subjects' where appropriate, as these terms imply various metaphysical and ontological assumptions. I refer specifically to 'objects' or 'subjects' only where the differences between these terms are relevant. Given the assertion that the physical world of spacetime is an aspect of a more-than-4-dimensional realm, existence does not imply *physical* existence. As such, I accept that existences include not only entities, objects, and subjects, but also numbers, thoughts, concepts, hallucinations, etc.[25]

The term 'hyperdimensional' means 'more dimensions than' and I generally use it to refer to more dimensions than those of spacetime, or 'beyond spacetime' (Hardy, 2019, 1015). 'Hyperdimensional neutral monism' refers to a type of neutral monism which relies on more dimensions than those of spacetime. However, I also utilize 'hyperdimensional' to refer to more dimensions than a comparative existence. For example, the cube in figure 1 is the hyperdimensional ground of the plane defined by the dimensions of length (x) and width (y). Conversely, the term 'hypodimensional' means 'fewer dimensions than' and relates to the notion of 'surface' as defined below.

I utilize the term 'surface' in an abstract sense to refer to a hypodimensional aspect of an existence. In other words, a plane is the 'surface' of cube, in the sense that it is a 2-dimensional aspect of a 3-dimensional existence – see figure 3. However, in the abstract sense, the term 'surface' refers to *all* hypodimensional aspects of an existence, so a line or a point can also be the surface of a cube – see figure 4. It is in this way that the physical, 4-dimensional world of spacetime is deemed to be a hypodimensional aspect, or surface, of the more-than-4-dimensional ontological ocean.

[25] See Nelson, 2020 for a detailed discussion on existence

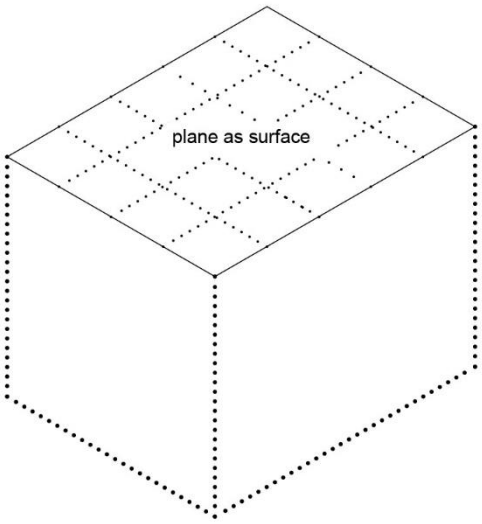

Fig 3 Plane as surface of cube

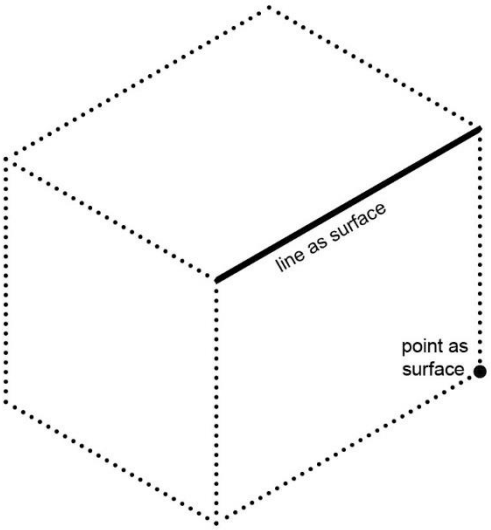

Fig 4 Line and point as surface of cube

The surface of a finite element can also be conceived of as the intersection of two finite or infinite elements. For example, a line can be seen as either the surface of a finite plane, or the intersection of two planes. For simplicity, I utilize surface, rather than intersection, throughout this dissertation until the distinction between them becomes relevant.

4.3 - Overview

Hyperdimensional neutral monism states that ultimates exist in more than the four dimensions which define spacetime. These ultimates constitute a more-than-4-dimensional 'ocean', the surface of which is the 4-dimensional world of spacetime. As such, the relationship between ultimates and spacetime is a dimensional relationship – spacetime is the 4-dimensional aspect (or surface) of the more than 4-dimensional ocean of ultimates (or 'ontological ocean')[26]. This ocean is *more than* spatio-temporal as it exists within space, time and consciounth. Instead of a spatio-temporal universe, I propose a spatio-temporo-concsiounsal universe, of which spacetime is the surface - see figure 2 above.

Subjects of experience appear within this ontological ocean as protrusions of the surface into the dimension of consciounth. These protrusions can be likened to whirlpools or vortices appearing within an ocean of water (Shani, 2015)[27]. Just as physical vortices have surfaces which

[26] Ultimates can be conceived of as zero-dimensional points.

[27] The metaphor of vortices, whirlpools, or localizations as subjects of experience is a common tool amongst idealist and cosmopsychist thinkers. In addition to Shani, see Kastrup (2014), Matthews (2011), and Nagasawa

are part of the surface of the ocean, subjects of experience have bodies (including brains), which are part of the physical world of spacetime.

It is within this framework that I explore the relationship between brains and consciousness (or the objective and subjective). Contrary to the physicalist assertion, brains do not create consciousness; and contrary to the idealist assertion, consciousness does not create spacetime within which the brain exists. Rather, *I assert that the human brain is the surface of human consciousness.* Or more specifically, the human brain is the 4-dimensional spatio-temporal aspect of human consciousness; And human consciousness exists in the hyperdimensional realm of space-time-consciounth.

4.4 - Intrinsic vs extrinsic curvature

A vortex is a 3-dimensional entity, as compared to the 2-dimensionality of the surface of the ocean (excluding time for both). However, the *surface* of a physical vortex is still 2-dimensional, as *all physical* surfaces in spacetime are, by definition, 2-dimensional. For the purposes of this dissertation however, I assume that the curvature of the surface of the vortex is *extrinsic,* meaning that it curves into a higher dimension and therefore must *exist within* three dimensions or more (Casey, 2012).

The difference between intrinsic and extrinsic curvature is important and can be seen in figures 5 and 6 respectively. Intrinsically curved surfaces can be thought of as *stretched* flat planes, whereas extrinsically curved surfaces can be thought of as *rolled* flat planes.

& Wager (2017). The notion of vortices has no relationship to Cartesian vortices, which refer primarily to planetary motion.

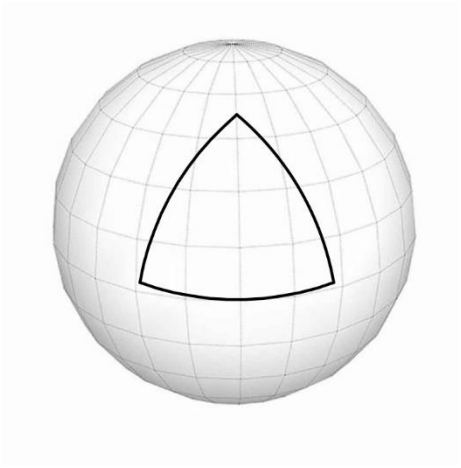

Fig 5 Intrinsic curvature

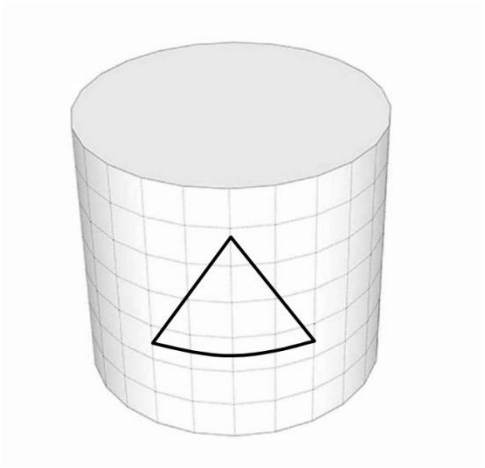

Fig 6 Extrinsic curvature

Intrinsically curved surfaces[28] do not maintain the geometric rules of flat surfaces and they do not require additional dimensions to describe their curvature. For example, on an intrinsically curved plane such as the surface of a sphere, parallel lines converge, and the angles of a triangle are greater than 180˚[29] (see figure 5). Intrinsic curvature can be completely determined by measuring angles and distances on the surface without reference to the manner in which the surface is embedded in its hyperdimensional space (for example by measuring the angles of a triangle) (Ibid).

Extrinsically curved surfaces such as the surfaces of cylinders on the other hand, maintain the geometric rules of flat surfaces but require additional dimensions to describe their curvature. For example, on the surface of a cylinder, parallel lines do not converge, and the angles of a triangle equal 180˚ (see figure 6). Extrinsic curvature is not detectable without reference to the manner in which the surface is embedded in its hyperdimensional space (because the angles of a triangle equal 180˚ regardless of the extrinsic curvature) (Ibid).

Einstein's theory of general relativity asserts *intrinsic* curvature of spacetime and therefore does not require additional dimensions beyond those of spacetime. In contrast, HNM asserts *extrinsic* curvature of spacetime (in addition to the intrinsic curvature of general relativity) and therefore *does* require additional dimensions. I therefore utilize the terms 'extrinsic curvature' and 'dimensional protrusion' in relation to surfaces interchangeably.

[28] Also known as Gaussian curved surfaces.

[29] A sphere has a positive intrinsic curvature. For a negative intrinsic curvature, such as a hyperbolic plane (or saddle) parallel lines diverge, and the angles of a triangle are less than 180˚.

4.5 - Consciousness and dimensional protrusion

Having introduced the notion of extrinsic curvature, we can see that a vortex is not just a complex combination of atoms. Critically, a vortex is also the extrinsic curvature of the surface of the ocean, or the protrusion of the surface into three dimensions. It is through this protrusion that the surface acquires depth. Similarly, it is not just the complex combination of qualities that results in the formation of consciousness, but the protrusion of the 4-dimensional surface (spacetime) into more than four dimensions. It is through this protrusion that spacetime acquires consciounth.

Figure 7 shows how the surface of an ordinary, volumetric cube can protrude into the dimension of depth. This surface now exists in three dimensions (including depth) and can no longer be described solely in planar terms. Figure 8 shows a similar diagram for the more-than-4-dimensional cube, of which the surface is the 4-dimensional world of spacetime. The surface now exists in more than four dimensions (including consciounth) and can no longer be described solely in spatio-temporal terms. I assert that the protrusion of the surface into the consciousal dimension *is consciousness*.

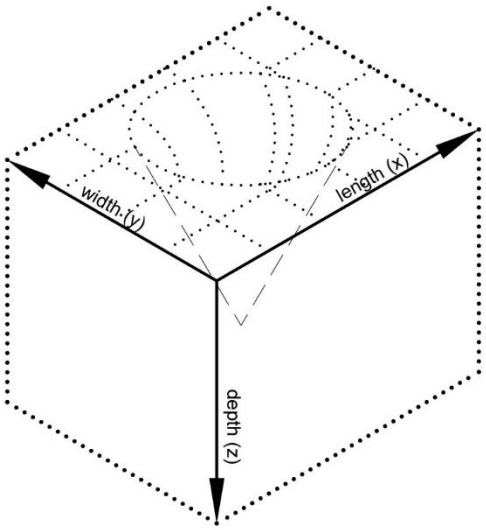

Fig 7 2D surface 'protrudes' into 3D cube

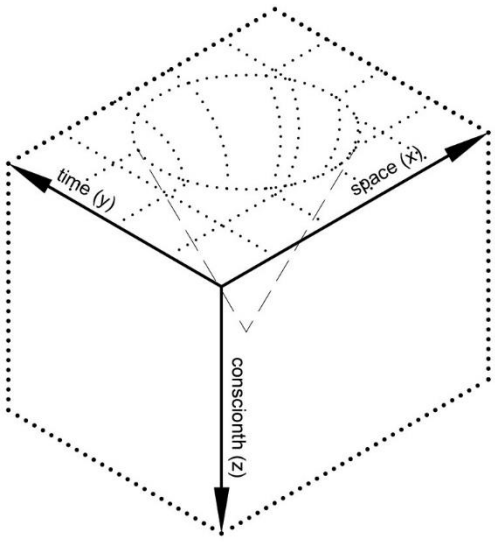

Fig 8 4D surface 'protrudes' into >4D cube

In order to explain the relationship between dimensional protrusion and consciousness, a deviation from both PQ and the aquatic metaphor is required. As stated above, according to PQ, awareness is identified with the act of reflective access to phenomenal qualities of one's own

brain. As such, awareness is a purely functional process, and consciousness must therefore be an emergent phenomenon (Shani, 2021).

In contrast to PQ, HNM asserts that the fundamental dimension of consciounth *is* the subjective dimension. But this is not a 'dimension' in the sense that the ultimates *experience it* in the form of awareness, perceptions or feelings. Rather, it is a dimension in the sense that the ultimates exist *within it* as well as within the dimensions of spacetime. The relationship between ultimates and space-time-consciounth is analogous to the relationship between fundamental matter and spacetime.

Thus, I am not claiming that there are additional *spatio-temporal dimensions* beyond the four that we perceive. Rather*,* I am claiming that there are additional dimensions beyond the four that we perceive*, and that these additional dimensions are not spatial nor temporal, but rather consciousal. To exist as a spatio-tempero-consciousal entity, is to be a conscious subject of experience which has a physical existence in spacetime.*

As the consciounth dimension is in some ways neither spatial nor temporal, and in other ways more than spatial and temporal, it cannot be conceived of in spatial or temporal terms. Rather it must be conceived of in terms relating more closely to consciousness. Here, the deviation from the aquatic metaphor is required. *While the assumption of depth by a 2-dimensional surface is identical to a 3-dimensional* ***object*** *(a cone), the assumption of depth by the 4-dimensional surface is identical to a hyperdimensional* ***subject*** *– a conscious subject of experience*.

There is a relationship here with identity theory, which asserts that consciousness is identical to the brain (Lewis, 1966, 1980; Smart, 2000). But under HNM, the identity relationship is not between consciousness and the brain, but rather between consciousness and the hyperdimensional existence, of which the brain is the surface. And if consciousness itself is identical to a hyperdimensional existence, then a specific state of consciousness is identical to the *structure* of the hyperdimensional existence, or the way in which the surface protrudes into the consciounth dimension. For example, rather than pain being synonymous with C4 firing (to use an oft used, over-simplified example), it is synonymous with a specific hyperdimensional structure, which corresponds to C4 firing. This correspondence is not a logical (a priori) necessity, but rather a natural (a posteriori) result of hyperdimensional laws. As such, pain is a priori identical to a particular hyperdimensional structure, and it corresponds, a posteriori, to C4 firing.

It should be noted, however, that the proposed identity relation between a conscious subject or a conscious experience and a specific hyperdimensional existence seemingly introduces another explanatory gap, as one can imagine a hyperdimensional existence which does not correspond to a conscious experience. In other words, HNM zombies appear to be conceivable. I will address this concern in part 5 below.

4.6 - Consciousness and the brain

The identification of hyperdimensional existences with conscious subjects of experience can be further explicated through more diagrams of dimensionality. Figure 9 shows two seemingly identical circular patterns on a simple plane consisting of a rigid checkerboard pattern. The circular patterns have far greater complexity than the checkerboard context which surrounds them. The circular patterns, however, are only identical when viewed from a particular vantage point, orthogonal to the plane itself.

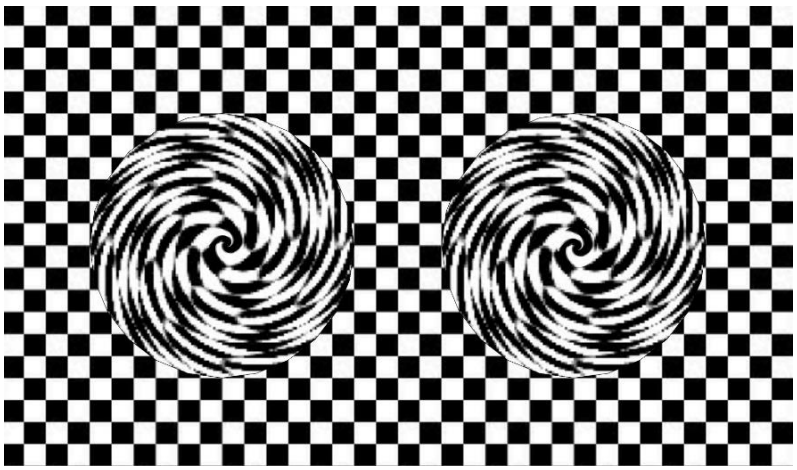

Fig 9 Two seemingly identical circles with greater complexity than their context

Figure 10 demonstrates that these patterns are not identical when viewed from another angle. In this diagram, we can clearly see that the circle on the left is actually a cone (or vortex), while the circle on the right is a planar circle as it originally appeared in figure 9. While the circle on the right does, in fact have more complexity than the checkerboard context, it is still a 2-dimensional object and therefore does not have any depth.

Fig 10 The 'circle' on the left is actually a cone. It only appears identical to the circle on the right from the specific perspective of figure 9.

These diagrams demonstrate the relationship between brains, which exist in the four dimensions of spacetime, and subjects of experience which exist in the hyperdimensional realm of space-time-consciounth. To assume that the universe is fundamentally 4-dimensional is equivalent to the assumption in figure 9, that the circular patterns and their contexts are 2-dimensional. Based on this assumption, it seems that the circular patterns are differentiated from their context purely in terms of complexity. The circular patterns are more complex than their surroundings, just as brains are more complex than their physical surroundings.

This complexity is generally assumed to be what creates consciousness, at least from a physicalist perspective.[30] Given that physicalists assume that the universe is spatio-temporal, they assume that consciousness must also be spatio-temporal as it is a part of the universe. Hence, the only thing which differentiates a brain from a table or a cloud, is its relative physical complexity. It is this complexity, the argument goes, which must create consciousness, as there are simply no other tools available.

However, from the perspective of figure 10, we see that the difference between (what we previously called) circular patterns, and their context is not just one of complexity, but one of dimensionality. We see that what seemed like a circular pattern on the left is actually a vortex or a cone. As the surface of this vortex is extrinsically curved, it protrudes into the dimension of depth. Likewise, the difference between brains and tables or clouds is not just a difference of complexity, but also of dimensionality. A brain, which is the surface of a subject of experience, is

[30] Other theories such as integrated information theory (Tononi, 2012) also correlate complexity with consciousness. For IIT, however, it is complexity of information, rather than complexity of physical composition which creates consciousness.

extrinsically curved and thus protrudes into the dimension of consciounth. This protrusion *is consciousness.*

The differentiation between consciounth and consciousness can be seen here. *Consciounth* is the dimension(s) which is (are) orthogonal to spacetime, whereas *consciousness* is the protrusion of spacetime into the dimension(s) of consciounth. In this way, consciounth is an ontologically fundamental dimension like space and time, whereas consciousness supervenes on both spacetime and consciounth.[31]

It is crucial to note that consciousness is described not just in terms of consciounth, but rather in terms of space-time-consciounth. Just as a vortex exists in 4 spatio-temporal dimensions, consciousness exists in more than four spatio-tempero-consciousal dimensions. While depth may be necessary for the existence of a vortex, it is not sufficient. Vortices exist in three spatial dimensions and one temporal dimensions. Similarly, while consciounth may be necessary for the existence of subjects of experience, it is not sufficient. Subjects exist in three spatial dimensions, one temporal dimension and at least one consciousal dimension.[32] As such, protrusion into the dimensions of consciounth can be seen as a means of obtaining a spatio-tempero-consciousal existence. It is this spatio-tempero-consciousal existence which is identical to a subject of experience.

Given that spacetime is necessary for consciousness, an account of the relationship between spacetime and consciousness is critical. While I have thus far engaged with the *dimensional* relationship between brains and subjects of experience, a detailed discussion of the *functional* relationship between brain states and mental states is still required.

When I, as a subject of experience, experience the red-ness of a fire engine, a particular wavelength of light is reflected off the surface of the fire engine into my retina. My retina then

[31] While consciousness supervenes partly on the physical dimensions of spacetime, HNM can be differentiated from physicalism in that spacetime supervenes on the ontological ocean and is thus derivative rather than fundamental.

[32] I generally refer to the dimension of consciounth as a single dimension for the sake of simplicity. However, just as space is compactified into 1 dimension, the same can be said for consciounth. Different explanatory gaps can potentially be addressed by protrusions into different dimensions of consciounth. Speculatively, the dimensions of consciounth could conceivably consist of the dimensions of awarenth, experienth, etc. Alternatively, dimensions of consciounth could be linked to the hedonic dimensions of pleasure and pain (Morch, 2017). Dimensions of consciounth will be explored in future work.

sends signals to my brain. The fire engine, my retina, and my brain are all part of the physical, objective world of spacetime. But my retina and brain are also part of a system which is extrinsically curved in the dimension of consciounth and are therefore part of a system which is conscious. The objective facts of the light hitting my retina and my retina sending a signal to my brain are subjectively experienced as a result of the dimensional protrusion of the system. The consciousness of this system combined with the specific qualities corresponding to the redness of the fire engine, *is the subjective experience of seeing red.*

As stated above, the notion of subjective experience can be defined as a specific perspective or point of view combined with a private qualitative field (Coleman, 2014). Private qualitative fields have two essential components – unity and boundedness (Miller, 2018, 142-143). Unity refers to a 'conjoint phenomenology…, i.e. there is something which it is like to have [phenomenal experiences] 'together' (Ibid). Boundedness refers to being 'phenomenally unified and… not phenomenally unified with any other experience…' (Ibid).

According to HNM, my experiences are *unified* by virtue of the fact that they occur within the same existence, whose surface protrudes into the dimension of consciounth. The experience of the red-ness of the fire engine is conjoined with the experience of the sound of the fire engine by virtue of the fact that these experiences occur within the same unified existence. And the existence itself is unified by virtue of the fact that it protrudes into the dimension of consciounth. Just as a physical vortex serves to unify its constituent atoms into a constantly fluctuating unified *object*, a dimensional protrusion of the surface of the ontological ocean serves to unify its constituent qualities into a constantly fluctuating unified *subject*. But as this subject has a spatio-temporal aspect, it must also have an objective aspect. As such, it is both a subject and an object. This aligns with the fact that a subject of experience also corresponds to an objective physical body.[33]

Furthermore, experiences are *bound* by virtue of the fact that they occur within one protrusion and not another. Simply put, I experience the red-ness of a fire engine which I am looking at, while you do not, because the light from the fire engine is hitting my retina, but not yours. As my retina is part of a protrusion which corresponds to me, while your retina is part of a

[33] Thank you to the Philosophia anonymous reviewer for pointing out that under HNM, a subject of experience also has an objective aspect.

protrusion which corresponds to you, I experience the red-ness of the fire-engine, while you do not.

4.7 - Consciousness and life

So, who or what is conscious? Or in the HNM framing, what types of physical existences protrude into the dimension of consciounth? It is clear from our own experience that humans are conscious. And it seems reasonably safe to assume that apes, cats and dogs are conscious. But what about bees and worms? Or cells and viruses? What about fundamental matter, such as atoms or subatomic particles? Are computers or computer networks conscious? Could they become conscious?

I argue that the threshold for dimensional protrusion corresponds with the existence of life. According to this threshold, all life protrudes into the dimension of consciounth, while all inanimate objects do not. In other words, inanimate objects are spatio-temporal, while all life forms are spatio-tempero-consciousal.[34]

This understanding broadly aligns with common intuitions regarding consciousness. It is generally assumed (at least by non-panpsychists) that non-living existences are non-conscious, regardless of their complexity. For example, computers or networks of computers are generally deemed to be non-conscious, even though they have high levels of complexity. While the complexity of the internet may rival or surpass that of the brain of a worm, intuition (or *my* intuition at least) would have us accept the consciousness of a worm before it would accept the consciousness of the internet.

However, this does not imply substrate dependence. HNM does not assert that only life *can* protrude in the dimension of consciounth, but rather that only life *does* protrude into the dimension of consciounth and therefore *only life is conscious*. The link between life and consciousness is *a posteriori* rather than *a priori.* If computers protruded into the dimensions of consciounth, they would also be conscious. But, so long as they exist solely in the realm of space-time, they are not. As such, in order for us to create conscious computers, we would need

[34] This does not imply that consciounth is unnecessary for the existence of inanimate objects. Rather all spatio-tempero-consciousal dimensions, including consciounth, are necessary for inanimate existences, in the same way that all spatio-temporal dimensions, including depth, are necessary for the existence of the surface of the ocean.

to understand exactly how to extrinsically curve them in the dimension of consciounth. Creating complex spatio-temporal existences will simply not be sufficient.

One objection to the proposed correspondence between consciousness and life is that there is a vague line between living and inanimate forms. In other words, there is no consensus on the definition of 'life'. As such, the life-inanimate distinction seems arbitrary or artificial.[35]

However, the fact that there is no consensus on the definition of life corresponds with the fact that there is no consensus on which existences are conscious. The proposed correspondence between life and consciousness is therefore a correspondence between two categories which both evade a consensus. As such, why couldn't they correspond with each other?

Another objection to the correspondence between life and consciousness is that of why molecules or atoms don't also protrude into consciounth? Why draw a line at life, rather than allowing for consciousness 'all the way down'? The main difference between bunches of molecules and living existences is in terms of complexity and organisation - but this raises the question of why that particular complexity or organisation? Why not rather adopt a panpsychist version of HNM which allows for consciousness at all levels of complexity?[36]

The problem with a panpsychist version of HNM is one of parsimony. Like most versions of panpsychism, panpsychist HNM would ascribe consciousness to atoms, molecules and/or sub-atomic particles. But unlike more traditional forms of panpsychism, these conscious particles do not add any explanatory power in the context of HNM. Under other forms of panpsychism, conscious particles are required in order to explain macro-level consciousness. They ascribe consciousness to atoms in order to explain how consciousness arises in humans. However, HNM explains human consciousness through dimensional protrusion, so conscious particles are simply not required. In the context of HNM, conscious atoms do not contribute anything. As such, the version of HNM which establishes the threshold for consciousness at life is qualitatively more parsimonious than a panpsychist version of HNM which ascribes consciousness to all matter.

Furthermore, the question of 'why that particular complexity or organization' is misleading in the context of HNM. The complexity or organization is not what corresponds to consciousness. In fact, as demonstrated in figures 9 and 10 above, it is possible to have an identical physical

[35] Thank you to the Philosophia anonymous reviewer for this critique.
[36] Thank you again to the Philosophia anonymous reviewer for these questions.

structure without corresponding to consciousness. We can see that hypodimensional complexity *can* correspond to its hyperdimensional ground but is not required to. Physical complexity is thus an *indicator* of dimensional protrusion but is not equivalent to it.

As such, HNM would challenge the statement that the main difference between bunches of molecules and living existences is one of physical complexity. Rather HNM states that the main difference is that living forms are spatio-tempero-consciousal existences while bunches of molecules are spatio-temporal existences. In this light, just as computers which protrude into the dimension of consciounth would be conscious, complex arrangements of molecules which are physically identical to living organisms, but do not protrude into the dimension of consciounth, would not be conscious. Rather they would correspond with physicalist zombies as discussed above.

The correlation between life and consciousness may also seem to present a form of the combination problem for HNM. If viruses and cells are conscious, then how do they combine to create human consciousness?[37] However, this problem is based on a misinterpretation of HNM. According to HNM, the dimensional protrusion of viruses and cells do not *combine* to create human consciousness. Rather, both viral and human consciousness are protrusions of the surface into the realm of space-time-consciounth, and these protrusions may occur at different, but interrelated scales. Viral consciousness does not combine to create human consciousness; and human consciousness does not de-combine to create viral consciousness. Rather, viral and human consciousnesses are interrelated spatio-temporo-consciousal existences – see figure 11.[38]

[37] It is worth noting that the classification of viruses as living is contentious. This contention pertaining to the boundary between living and non-living things, however, also applies to boundary between conscious and non-conscious things. I argue that this may be as a result of the correlation between life and consciousness.
[38] This notion also seems to allow for (or even require) the existence of consciousness at a higher scale than human consciousness, such as an earth-wide consciousness or Gaia.

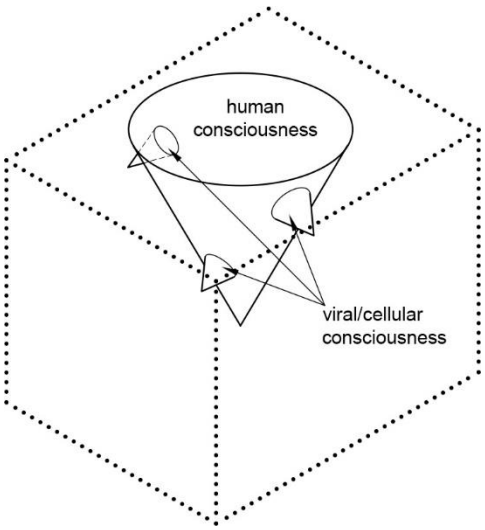

Fig 11 Relationship between related spatio-tempero-consciousal existences

Readers may note that the cardinal axes of space, time and consciounth have been omitted in figure 11. This omission allows for a further clarification, in that human consciousness and viral/cellular consciousness seem to protrude from different surfaces - human consciousness protrudes from the top surface of the cube, whereas viral/cellular consciousnesses protrude from the surface of the human vortex. The point, however, is that both humans and viruses/cells are spatio-temporo-consciousal existences *as a result of their respective protrusions.* As such, we see that the critical issue regarding consciousness is existence in the realm of space-time-consciounth. We see that the surface protrusions obtain such existences and the dimensions of space, time and consciounth are all equally fundamental and equally necessary for consciousness.

It is important to note that just as the physical structure of a virus is radically different from the physical structure of a human, viral consciousness is radically different from human consciousness. As Nagel notes, 'our own experience provides the basic material for our imagination, whose range is therefore limited' (Nagel, 1974, 3). As such, we cannot imagine what it is like to be a bat or a virus. However, this does not preclude the possibility that bats and viruses are conscious. Rather, according to HNM, viruses and bats are conscious, but as their consciousnesses (or spatio-tempero-consciousal existences) are radically different from human consciousness, we simply cannot imagine what it is like to be them.

4.8 - Hyperdimensional Neutral Monism and Cosmopsychism

While hyperdimensional neutral monism is a form of neutral monism, it shares a reliance on the aquatic metaphor with various forms of idealism (Kastrup, 2014, 2017a-c, 2018) and CP (Nagasawa & Wager, 2017; Shani, 2015; Matthews, 2011). I therefore utilize this metaphor to compare HNM to CP as well as to explain various subtle aspects of HNM. I also note that HNM is likely to be subject to the 'incredulous stare' objection (Shani, 2021) even from the fringes of panpsychism and PQ, and I therefore note the similarities between HNM and CP as a means of inferring metaphysical viability and respectability.

As stated above, Shani lists seven postulates of CP. For ease of reference, I re-list these postulates again here:

1. The cosmos as a whole is the only ontological ultimate there is, and it is conscious (2015, 408).

2. The cosmos as a whole is prior to its parts (priority monism) (Ibid).

3. The cosmic consciousness (or 'absolute') has a concealed and revealed side. The concealed side is the 'intrinsic dynamic domain of creative activity', and the revealed side is the 'outer, observable expression of that activity' (Ibid, 410). This is termed the 'lateral duality principle'.

4. The absolute can be likened to a vast ocean of consciousness.

5. Cosmic consciousness is like a vacuum in quantum field theory. It is the background against which local interference patterns are discerned as phenomenal states.

6. Individual entities are dynamic constructions within the absolute.

7. The relationship between individual entities and the absolute can be likened to aquatic metaphors of the relationship between vortices within the ocean and the ocean itself (My list, derived from Shani, 2015).

Postulates 6-7 are the basis for the comparison between HNM and CP and are thus mostly taken as a given. The primary difference between CP and HNM with regards to these postulates is that CP deems individual entities to be 'dynamic constructions', whereas HNM deems them to be

dimensional protrusions. As such, CP identifies human consciousness with a localization of cosmic consciousness– 'a knot or bulge of consciousness with an appearance of self-containment' (ibid, 418) – whereas HNM attributes human consciousness to a protrusion into the fundamental dimension of consciounth.

This difference relates to postulates 4-5, which seem to be at odds with the HNM claim of neutral ultimates insofar as they allude to the primacy of consciousness. However, I believe that the fundamentality of consciousness can be de-coupled from the metaphor of an ocean which serves as the background against which local interference patterns are discerned. As such, postulates 4-5 relate to HNM insofar as the 'cosmic consciousness' or 'absolute' can be reframed as the ontological ocean, which is not necessarily conscious.

Postulate 5 refers to the background in quantum field theory but can also be likened to the ZPF as discussed in Chapter 3.1 above. In the context of HNM, the 'background against which local interference patterns are discerned as phenomenal states' can be understood as the 'flat' surface of the ontological ocean, or the physical world prior to protrusion into the dimension of consciounth. It is the surface of the ontological ocean in its default state which contains the potentiality for phenomenal states. But unlike with CP, this unperturbed surface is not itself conscious. It is not correlated with the property of ipseity. Rather, it is only through the perturbation of the surface that it protrudes into the dimension of consciounth, and thus becomes associated with phenomenal states, including both awareness and ipseity.

Postulates 1 and 2 share some common ground, as they both refer (directly or indirectly) to token priority monism – there is one ontological ultimate, and all 'parts' of the ultimate are dependent on that ultimate for their existence. The first postulate states that the one ontological ultimate is conscious, which contradicts the HNM claim of neutrality.

Regarding the claim of monism, HNM clearly identifies with *type* monism in general, as it states that there is one *type* of fundamental 'stuff' in the universe (hence the 'monism' in 'hyperdimensional neutral monism'). This assertion, however, says nothing about *token* monism as stated in the first and second postulates of CP. Token monism as per CP is *priority* token monism as opposed to *existence* token monism (Schaffer, 2010). It is a top-down, rather than bottom up, approach.

Based on the assertion that ultimates combine to create the ontological ocean, HNM appears to identify with token priority pluralism (or atomism) as opposed to token priority monism. There are many qualities, and these qualities combine to create the ontological ocean.

But is HNM *necessarily* a token pluralist view? Why should we necessarily assume that the qualities *constitute* the ocean, instead of the ocean *being comprised of* the qualities? Why must the qualities be prior to the ocean? While HNM is compatible with either token monism or token pluralism, I argue that token monism is preferable for two primary reasons. The first reason is that of parsimony. Based on the arguments presented thus far, both physical *objects* and conscious *subjects* (or subjective experiences) can be accounted for by the surface of the ontological ocean and its protrusion into the dimension of consciounth respectively. As such, there is simply no need for the ocean itself to further supervene on parts. The ocean itself is sufficient for the existences of which we are aware (objects and subjects), so the supposition of qualities which constitute the ocean in a bottom-up manner is unnecessary and therefore unparsimonious. This does not imply that qualities do not exist. Rather, qualities exist, but they supervene on the ontologically primary ocean, which can now be understood as an enqualitied tapestry as per token monist PQ. It is a top-down, rather than bottom-up supervenience relation.

Based on this notion, we can now explore the subtle difference between a token monist position and a top-down position. Recall that I previously noted that these two positions tend to be seen as identical. A token monist position is necessarily top-down (barring a strict identity relation between the monistic whole and its parts). But a top-down position is not necessarily token monist. Previously, I used the example that an atom is a constituent part of a marble and there is more than one marble in the universe. But given the notion of dimensionality, we can see that there is a more profound distinction between token monism and a top-down approach. If the physical universe is a hypo-dimensional aspect of a hyper-dimensional ocean, what is to say that the ocean is not simultaneously a hypo-dimensional aspect of some other fundamental existence? Just as a point is a hypo-dimensional aspect of a line, which is a hypo-dimensional aspect of a plane, which is an aspect of a cube, etc, the ontological ocean could be a hypo-dimensional aspect of a ‘hyper-ocean’.

In some sense, this understanding would still be token monistic, as there would still be a single multi- (or infinite-) dimensioned realm. But recall that, while I have utilized the notion of a

surface as an example of a hypo-dimensional aspect, the notion of an *intersection* is equally applicable. For example, as stated above, a line can be seen as either the surface of a finite plane, or the intersection of two planes. As such, the physical universe could potentially be the intersection of multiple ontological oceans; And those oceans can in turn be intersections of multiple 'hyper-oceans'. Thus, while HNM is necessarily top down, it is not necessarily token monistic.[39]

Critics may object to this possibility on the grounds of infinite regress. However, some forms of infinite regress are benign rather than vicious, so not all forms of infinite regress are problematic. '[W[hether or not an ontological infinite regress is vicious or benign depends on what we set out to give an account of. If all we want is an account of why each thing exists, then it is benign; but if we want an account of why there are things at all, it is vicious.' (Cameron, 2022, 8).

The second advantage of priority token monism is based the arguments that Schaffer (2010) presents in relation to quantum entanglement. Two particles can be said to be entangled when '[no] matter how far apart the particles are, a spin measurement on one will immediately set the spin state of the other to the opposite' (Schaffer, 2010, 52). This seems to require 'communication' between the two particles at a speed faster than light, which is impossible according to the laws of general relativity. Alternatively, however, if the physical universe is deemed to be a monistic whole, no 'communication' between the particles is required, as both particles are defined by their mereological relation to the whole.

While a detailed discussion of quantum entanglement is beyond the scope of this article, Schaffer notes that the entangled universe displays an 'unbroken wholeness', which can be seen as evidence to support token monism (ibid, 53). This can be likened to the monistic enqualitied tapestry as relating to monistic PQ. And while critics may note that Schaffer applies his arguments for token monism specifically to the physical world, he also notes that if token monism is true, it is true with metaphysical necessity (ibid, 56). I therefore accept his arguments in favour of priority token monism and apply such monism to both the spatio-temporal aspect of the universe as well as the spatio-tempero-consciousal universe.

[39] HNM still identifies as type monist, irrespective of the question of token monism.

The CP notion that the single monistic ultimate is conscious is also worth exploring in detail. According to CP, the ocean as a whole is conscious. But according to HNM, it is the protrusion of the *surface* of the ontological ocean into the dimension of consciounth which is identical to a conscious physical subject. The relationship between the surface and consciounth is critical here, and consciounth alone is insufficient.

This concept can be explored through an analogy with spacetime. While time may be necessary for the existence of physical objects, it is insufficient. Physical objects require spacetime for their existence. Similarly, conscious physical subjects require space-time-consciounth for their existence. Furthermore, just as space and time can be said not to exist independently of each other, but rather as aspects of spacetime, spacetime and consciounth can be said to not exist independently of each other, but rather as aspects of space-time-consciounth.

The importance of the surface can be seen through the holographic principle as postulated by Stephen Hawking and Jacob Bekenstein. Loosely, the holographic principle states that '…the amount of information you can cram into a region of space is proportional to the area of the surface surrounding that space…' (Hoffman, 2019, 105).[40] While the holographic principle relates to the amount of *information* which can be described by the surface, I argue that it is relevant to *consciousness* as well. As such, a deep ocean with no surface protrusion would not be conscious, but a shallower ocean, with pockets of surface protrusion would contain pockets of consciousness. It is in this way that the cosmic whole is not conscious, but protrusions of the surface of the cosmic whole are.

HNM is thus differentiated from CP. Whereas CP states that the ocean as a whole is conscious and that macro-consciousnesses are localizations or 'knots' of the whole, HNM argues that the protrusion of the surface is necessary for consciousness. As such, the ontological ocean as a whole is not (necessarily) conscious, but consciousness exists within it because of the extrinsic curvature of its surface within the dimension of consciounth.

An exploration of postulate 3 offers further clarification on the relationship between HNM and CP. As previously stated, CP posits that the cosmic consciousness has a dual nature – a concealed side which corresponds to the cosmic consciousness, and a revealed side which corresponds to the observable universe (Shani, 2015). The revealed side is dependent on

[40] Information can be defined as the number of yes/no questions you need answer to fully specify a system (Wheeler, 2018,)

observers, as it is understood as 'what the universe looks like'. While Shani explains that these observers must be within the ocean as there is nothing outside of the ocean, the dependence on revelation to these observers nonetheless alludes to idealism.

In contrast, HNM does not posit that the physical supervenes on the mental. As the protrusion of the surface into the consciounth dimension is equated with consciousness, the physical world of spacetime is prior to the phenomenal world of consciousness[41]. However, HNM is not a form of physicalism as it posits that the physical world is an aspect of the fundamental ontological ocean, rather than a fundamental ontological ultimate in and of itself.

Whereas CP asserts that the physical world is the *revealed side* of the ultimate, HNM asserts that the physical world is the *surface* of the ultimate (or the surface of the ocean composed of ultimates from a token pluralist position). But if the surface is disposed to reveal the ocean in a particular way, then perhaps the revealed side and the surface are one and the same. Perhaps the 'revealed dimension of the absolute' is none other than the surface of the ontological ocean.

Critics may contend that the surface and consciounth of the HNM ocean seem to correspond to two different types of existences, thereby alluding to a sort of dualism, rather than neutral monism. In the physical word, for example, the surface of a crystal ball is made of crystal and the surface of the ocean is watery. So, in the physical world, the surface and the depth are of the same kind. Contrastingly, in HNM, the depth corresponds to consciounth, while the surface corresponds to a spatio-temporal medium. In other words, the surface and depth seem to correspond to two categorically different types of existences, and so the mind-body problem seems to, once again, apply to the relationship between these types of existences.[42]

This is a valid critique which underlies the limitations of the surface metaphor. However, while the surface metaphor alludes to hypo-and hyper-dimensional aspects of the same *type* of dimensions (spatial), similar metaphors can be made utilizing different types of dimensions, such as space and time. In this regard, space and time can be seen as different types of hypodimensional aspects of spacetime. I explore a metaphor of protrusion of different types of dimensions in section 4.9.3 below.

[41] This does not mean that spacetime is prior to consciounth, however.
[42] Thank you to the external reviewers for this insight.

The notion of dimensionality is also relevant to exploring the concealed side of the absolute. Shani states that

> … no concrete system consists merely of a revealed form, an observable causal structure, without also comprising a concealed intrinsic dimension… It follows that all concrete objects, all relatives, are abodes of consciousness … However, that all relatives are loci of experience does not imply that they are subjects of experience… [W]hether or not [a system] is endowed with a unified consciousness depends on the nature of its causal organization. (2015, 416)

The CP notion that all concrete objects are 'abodes of consciousness' is contrary to HNM. In the context of HNM, such a statement is equivalent to stating that all parts of the surface have depth, which is clearly false. Rather, only those parts which are extrinsically curved have depth. Likewise, only those parts of spacetime which protrude into the consciounth dimension are conscious or 'abodes of consciousness'.

Shani acknowledges that 'abodes of consciousness' are not necessarily subjects of experience, and in agreement with PQ states that causal organization determines whether a system is 'endowed with a unified consciousness.' HNM has explanatory potential here as it specifies what type of causal organization is required to endow a system with unified consciousness. A system with an extrinsically curved spatio-temporal surface into the dimension(s) of consciounth is conscious, while a system with an intrinsically curved spatio-temporal surface (or a system with a 'flat' spatio-temporal surface) is not.

4.9 - Refuting Criticisms

In this section, I respond to various critiques which could be levelled at HNM. The first critique is the argument from parsimony, which has two aspects. The first aspect is that the extra dimensions posited by HNM are unparsimonious, and that a simpler solution, which does not require such dimensions would be preferable. The second aspect is that even if we accept the additional dimensions, why would we posit hyperdimensional qualities (or a single hyperdimensional ultimate) which exist in these dimensions? Wouldn't it be simpler to accept the additional dimensions where they offer explanatory power, but omit the additional hyperdimensional qualities or monistic enqualitied tapestry? In responding this critique, I

introduce (and problematize) an alternative to HNM, which I call 'hyperdimensional physicalism'.

The next critique regards the causal interaction between mind and body as well as causal closure of the physical world. If the mental and physical exist in different dimensions, how could they possibly interact with each other? And if the physical world is the 4-dimensional surface of a hyperdimensional reality, then how could it possibly be causally closed as science seems to suggest?

The third critique refers to the issue of explanatory gaps and HNM zombies. As HNM claims an identity relation between the protrusion of the surface of the ontological ocean and a subject of experience, this identity relation needs to be explained. In other words, *why* is the protrusion of the surface identical to a subject of experience. Failure to adequately address this critique simply moves the explanatory gap from a quality/awareness gap to a protrusion/awareness or protrusion/subject gap.

The fourth critique concerns the quality and structure combination problems as discussed above. The final critique regards the definition of the term 'neutral' in HNM.

4.9.1 – The Argument from Parsimony

The first critique is that the supposition of additional dimensions is unparsimonious. Introducing additional dimensions seems to be a heavy price to pay to explain consciousness.

There are two responses to this concern. The first is to note that all philosophies of mind are subject to a milieu of problems, such as the hard problem of consciousness, the combination problem(s), or the problem of causal interaction. No theory seems to adequately address these issues, so a radical reframing seems justified. As additional dimensions can allow for consciousness without positing brute emergence (as per physicalism) or fundamental subjects of experience (as per idealism), it seems like an option which, at the very least, is worth exploring.

The second response is to note that numerous scientific theories, in particular various string theories, allow for more than four dimensions. Specifically, most types of string theory predict

either 10 or 26 spatial dimensions and 1 temporal dimension (Kaku, 2016). Some of these dimensions can exist within spacetime, while others can be seen to contain spacetime (such as various 'brane' theories) (Kaku, 2012). While the intricacies of string theory are beyond the scope of this dissertation, the string theory assertion that there are more than four dimensions than those of spacetime serves to provide validity to the similar assertion made by HNM. While the string theory assertion is far from *proof* of more than four dimensions, it demonstrates that the assertion can be compatible with rigorous scientific thinking and is not necessarily a crackpot assertion.

Furthermore, the fact that string theory asserts more than four dimensions demonstrates the parsimoniousness of HNM. HNM is not *adding* addition dimensions, but rather *reframing* additional dimensions which are already thought to exist. While string theory posits the existence of more than four *spatial or temporal* dimensions, HNM asserts that the additional dimensions are neither spatial nor temporal, but rather *consciousal*.

The claim of more than four dimensions differs from that of string theory on an epistemological as well as metaphysical level. Metaphysically, the claim differs regarding the *type* of dimensionality – the additional dimensions are neither spatial nor temporal. But these dimensions also differ regarding epistemic access. The additional dimensions posited by string theory generally do not relate directly to human experience (Wertheim, 2018). However, the additional dimensions posited by HNM *are the ground for conscious human experience*. The assumption of the dimension of consciounth is what allows for it to 'be like something'. This is a critical distinction. Rather than extra-spatio-temporal dimensions being outside of conscious human experience, they are deemed to have the most intimate relationship with conscious human experience. In a sense, these dimensions (or protrusions into these dimensions) are not *beyond* our consciousness; they *are* our consciousness.

As such, I argue that HNM is more parsimonious than string/brane theories as well as all other philosophies of mind. It is more parsimonious than string/brane theories because the introduction of additional dimensions relates to something that we know exists (consciousness), rather than something which is beyond human comprehension (additional spatial or temporal dimensions). It is more parsimonious than physicalism as it does not require brute emergence of consciousness; It is more parsimonious than panpsychism as it does not require conscious

atoms; and it is more parsimonious than idealism as it does not require fundamental subjects of experience.

Critics, however, may accept the additional dimensions as both parsimonious and scientifically viable, but question the existence of an ontological ocean (or qualities which constitute the ontological ocean) which exists in the hyperdimensional realm. If consciousness is identical to the protrusion of spacetime into space-time-consciounth, why not accept these dimensions, but discard the ontological ocean and its qualities?[43] Spacetime can seemingly curve into the realm of space-time-consciounth without positing any additional elements or qualities beyond those of spacetime. In other words, could we rather assert that the previously termed 'surface' of the ontological ocean is a self-contained[44] existence in the way that we usually conceive of spacetime, rather than a hypodimensional aspect of a hyperdimensional ocean?

See figures 12 and 13 for a graphic illustration of this argument. Figure 12 shows HNM as previously conceived – a spatio-tempero-consciousal ocean, the surface of which is the physical world of spacetime. Figure 13 shows a similar spatio-tempero-consciousal realm, but the physical world of spacetime is not a hypodimensional aspect of the ontological ocean. It is a self-contained 'plane' rather than a hypodimensional aspect of a 'cube'.

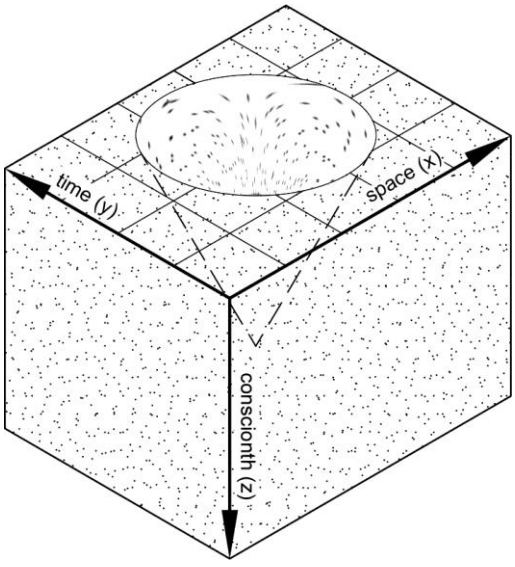

Fig 12 HNM

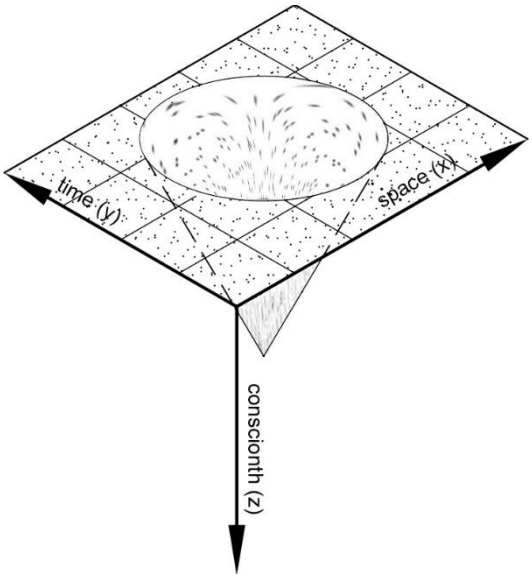

Fig 13 Hyperdimensional physicalism

[43] Thank you to the Philosophia anonymous reviewer for challenging me on the necessity of the ontological ocean.

[44] I utilize the term 'self-contained' to refer to an existence which does not supervene on a hyperdimensional ground but is rather an existence in and of itself.

This is a valid approach which states that the physical world is fundamental, but consciousness is the extrinsic curvature of the physical world in the dimension of consciounth. As it posits the physical as the fundamental ontological ground, it is most closely linked to physicalism. However, it deviates from physicalism in that it requires the existence of the consciounth dimension for spacetime to extrinsically curve within.[45] I call this alternative theory 'hyperdimensional physicalism'.

Hyperdimensional physicalism has the advantage of parsimony, as it states that consciousness is simply the extrinsic curvature of spacetime into space-time-consciounth. As such, while it still requires hyper-dimensions, it does not require (nor does it allow for) an ultimate (or ultimates) which exist in these dimensions other than those on the self-contained plane of spacetime.

This is an exciting alternative which warrants further study. However, for the purposes of this dissertation, I simply note my primary objection, which is the problematic notion of self-contained, hypodimensional existences within hyperdimensional realms. In the 4-dimensional world of spacetime, all seemingly 3-dimensional spatio-temporal entities are hypodimensional aspects of 4-dimensional grounds. For example, the 2D surface of the ocean (3D if we include time) is a hypodimensional aspect of the 3D ocean itself (4D if we include time). Also, a 3D object with no extension in time amounts to a non-existent object.[46] Given that hypodimensional entities within hyperdimensional realms are impossible in 4-dimensions, there is no reason to believe that they are possible in more than four dimensions. Hence the idea of four-dimensional spacetime as a self-contained 'plane' in more than four dimensions is problematic. While this is far from a knock-down argument, I take it as sufficient for the purposes of this dissertation and leave detailed discussions of hyperdimensional physicalism for future work.

4.9.2 - Causal Interaction and Causal Closure

Regarding the issue of the relationship between mind and body, critics may argue that HNM faces a similar challenge to dualism – that of the problem of causal interaction. If the mental and

[45] Readers may also note similarities between hyperdimensional physicalism and physicalist panpsychism as per Strawson (2017). However, these theories differ in that physicalist panpsychism argues that there is nothing beyond spacetime, whereas HNM posits space-time-consciounth. Furthermore, panpsychist physicalism asserts conscious fundamental matter, whereas hyperdimensional physicalism attributes consciousness to the extrinsic curvature of spacetime. As such, under panpsychist physicalism atoms are conscious, whereas under HNM, they are not.

[46] Thank you to the Philosophia anonymous reviewer for this insight.

physical exist in a differing number of dimensions, how could they possibly interact with each other? (Carter, 2014, 62)

However, the notion of causal interaction between mind and body misses the point of the dimensional relationship between them. Given that mind and body are different dimensional aspects of one thing, they *correlate* with each other, but do not *interact* with each other. The 4D ocean can be said to ground the surface of the ocean, but we would not say that it causally interacts with it.[47]

A thornier problem for HNM regards the causal closure of the physical world. It seems to be a well-accepted theory that the physical world is causally closed. But if the physical world is the surface of the ontological ocean, how could it possibly be causally separable from the ontological ocean?

The issue of causal closure is, to my mind, the thorniest issue for HNM. In order to address this issue, I contest the claim of causal closure of the physical world. While this is clearly an unpopular approach, which seems to put any theory at odds with most current scientific thinking, it is a viable approach for HNM. And while this approach may be unpopular, it is not inconceivable.

Quantum physics provides an avenue by which the physical universe may not be causally closed. While an analysis of quantum physics is beyond the scope of this dissertation, it is important to note that quantum physics allows for the prediction of *probabilities* of quantum events but not the prediction of actual events. It can predict, with incredible accuracy, that a specific outcome will happen a specific percentage of the time, but it cannot predict what outcome will happen in a single trial. Furthermore, quantum physics seems to involve the collapse of the quantum wave function upon observation or measurement, and thus *seemingly* relies on consciousness itself (Carroll, 2017).[48]

Both the probabilistic nature of the quantum world, and the seeming dependence on observation or measurement are problematic for quantum physics, and one approach to resolving these problems is the introduction of hidden variables. The 'hidden variables'

[47] Thank you to both Philosophia anonymous reviewers for highlighting the distinction between interaction and correlation.

[48] Other theories, such as the 'many worlds theorem' posit that the wave function does not actually collapse. Rather, all possibilities happen in different universes, and we just find ourselves in one of the many universes.

approach states that there are unobservable entities (or dimensions) which have explanatory power for the predictive nature of quantum physics. In some versions, this approach states that the reason why quantum events seem to be probabilistic is simply because we don't have all the necessary information (Ibid, 166).

HNM is committed to the idea that the probabilities are determined by what happens beneath the spatio-temporal surface, which constitutes a hidden variable. And since what happens beneath the spatio-temporal surface (or within the spatio-tempero-consciousal realm) is linked to consciounth and consciousness, it is not surprising that observation or measurement play a role in the quantum realm. As such, HNM is committed to the unpopular idea that the physical universe is simply not causally closed. Rather, the physical universe is subject to hyperdimensional laws, of which the physical laws we have already discovered are a subset, just as the surface of the ocean is subject to physical laws, of which planar laws are a subset.

It is important to note that gaps in the laws of physics would not manifest as observable *violations* of the laws of physics. Rather, the gaps would manifest as *limitations* on the laws of physics. These limitations are then evident in the probabilistic nature of quantum mechanics. In other words, we should not expect to find instances where the laws of physics seem to be *wrong*. Rather, we should find instances where the laws of physics seem to be *incomplete*, which is, in fact, what we do find in the probabilistic nature of quantum physics.

It should also be noted that, while beyond the scope of this dissertation, hyperdimensional physicalism has the advantage of causal closure, as nothing exists beyond the physical world, even as the physical world is extrinsically curved within space-time-consciounth.

4.9.3 – HNM Zombies and the Explanatory Gap

Regarding the issue of the explanatory gap and the existence of philosophical zombies, critics will contend that HNM simply moves the bump under the rug, as there is still an explanatory gap between the protrusion of the surface into the dimension of consciounth and the existence of a conscious subject of experience. A circle extended in the spatial dimension of depth can result in a cone or a cylinder, but obviously the resultant 3D form is not conscious. So, if protrusion into another spatial dimension is not identical to a conscious subject of experience, why would protrusion into the hypothesized consciounth dimension be? We can arguably conceive of

hyperdimensional existence in space-time-consciounth, without conceiving of a conscious subject of experience, so HNM zombies are thus conceivable, or so it could be argued.

Given the difficulty in visualizing additional dimensions which are neither spatial nor temporal, I propose a thought experiment, loosely based on Edwin Abbott's 1884 novel 'Flatland' (Abbot, 2015).

Imagine a hypothetical 2-dimensional world, which contains 2-dimensional conscious subjects. These subjects can be thought of as two-dimensional shapes, such as circles or squares. For the purposes of this thought experiment, let us imagine that this world is described by the dimensions of space and consciounth (hence the conscious subjects), and that time is seemingly absent. In other words, it is apparently a spatio-consciousal universe – See figure 14. The subjects of this universe would have an atemporal experience of shape-hood.[49] As time is absent from their universe, their consciousness would clearly be very different from the type of consciousness that we experience. Thought would be impossible as thoughts require a temporal progression of consciousness. Likewise, experiences of music, movement, and change in general would be impossible.

Let us now imagine that time exists but is perpendicular to this plane and thus is not recognized by the inhabitants of Flatland. Given that Flatland exists at a specific value for time, we, as three-dimensional observers, can say that Flatland is defined by t=0- see figure 15.

[49] I refer to their experience as 'atemporal' rather than 'static', as 'static' refers to unchanging over time, whereas time does not seem to exist in this hypothetical universe. I also accept that critics might argue that experience is necessarily temporal, but ask the reader to suspend judgement on this issue for the sake of the thought experiment.

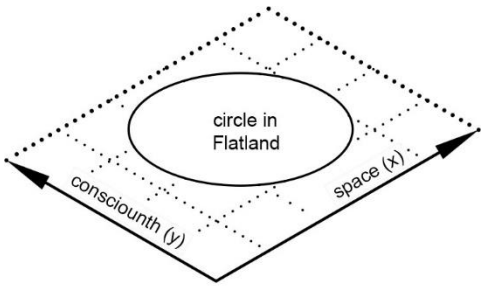

Fig 14 Circle in a spatio-consciousal universe

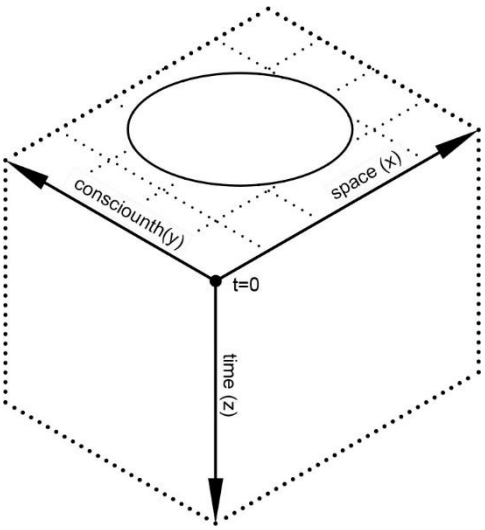

Fig 15 Circle in spatio-consciouso-temporal universe

Now imagine that these shapes protrude into the temporal dimension - see figure 16. With this protrusion, the conscious experience of a circle is no longer limited to t=0.

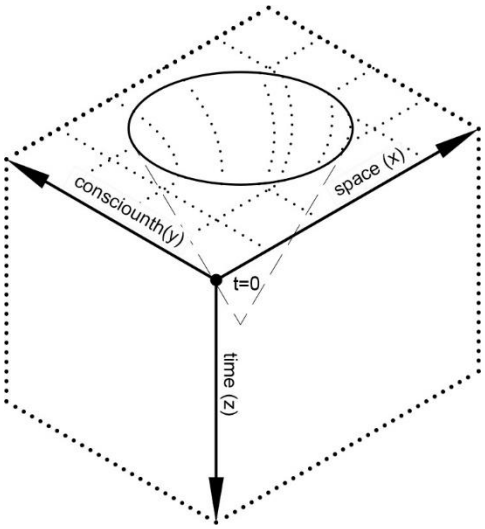

Fig 16 Circle protruding into temporal dimension

At t=1, the experience of the circle is *smaller*, and again it is smaller at t=2. In other words, the experience of an atemporal circle becomes the experience of a *shrinking* circle. In other words, the circle experiences *change.* See figures 17 and 18.

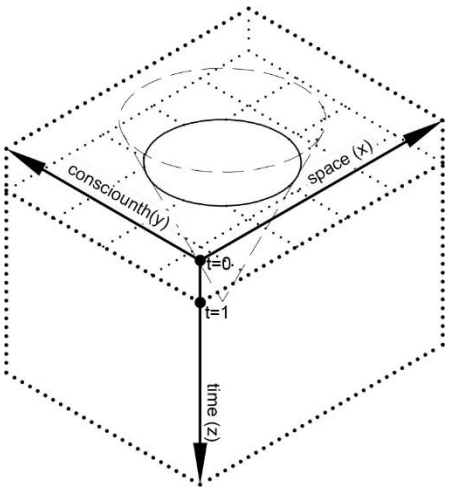

Fig 17 Smaller circle at t=1

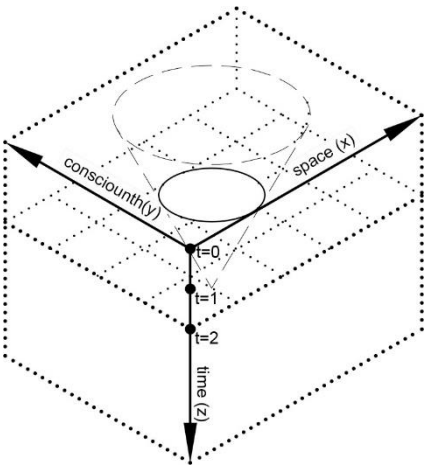

Fig 18 Even smaller circle at t=2

We can now imagine the relationship that the inhabitants of Flatland would have to change or dynamic experince. As the inhabitants protrude into the dimension of time, they would have dynamic experiences. But as they do not recognize the existence of the temporal dimension, they would have no way to explain dynamic experience. We could imagine them scouring the spatio-consciousal universe (in some weird, atemporal way) in search of change, but from our perspective, we can see that they will never find it in the spatio-consciousal universe. In order for them to explain change, they would need to understand that the universe is spatio-consciouso-temporal and that certain shapes protrude into the temporal dimension. They would need to understand that change *is* the protrusion into the temporal dimension.

The significance of this for HNM is hard to overstate. This is not the transition from a circle to a cone (even though it looks like it in the above diagrams). Rather, this is a transition from an atemporal experience to a dynamic one. It is the transition from a world which can be described by nouns, such as circles or squares, to a world which requires verbs, such as shrinking, folding, rotating, or more generally *changing.* Similarly, according to HNM, protrusion into the consciounth dimension is not a transition from a simple physical existence to a complex hyperphysical existence, but rather a transition from a non-conscious existence to a conscious one.

Based on this thought experiment, the original question of why protrusion into the consciounth dimension is identical to consciousness, can now be equated to asking why protrusion into the

temporal dimension is identical to change. Just as there is no explanatory gap between change and protrusion into the temporal dimension, there is no explanatory gap between consciousness and protrusion into the consciousal dimension. Change requires time for its existence, just as consciousness requires consciounth for its existence.

Critics may argue that the analogy between time and consciounth is misguided, as we have some understanding of what time is, but no understanding of what consciounth is (beyond the circular definition of 'that which enables consciousness'). However, this critique assumes that we know what time is beyond 'that which enables change' (or that we know what space is beyond 'that which enables extension').[50]

4.9.4 – The Structure and Quality Combination Problems

As noted above, Chalmers states the structure and quality combination problems in relation to neutral monism as follows:

1. Structure combination problem – how can the qualities instantiated in the brain constitute the qualities of which we are aware?
2. Quality combination problem – how can a few primitive qualities yield the vast array of qualities of which we are aware? (Chalmers, 2015, 29-30)

As the physical universe is deemed to be the *surface* of the ontological ocean and conscious subjects are deemed to be dimensional protrusions within that ocean, it should be unsurprising that the physical and the mental have radically different structures. As the surface and the volume of the ocean exist in different dimensions, their structures have a non-isomorphic relationship. Again, this can be seen in figures 9-10 above. Under HNM, the mismatch between the structure of the physical and that of the mental is as unsurprising as the mismatch between the structure of the 2-dimensional surface of the ocean and that of 3-dimensional vortices within the ocean.

As the structure combination problem assumes that the qualities instantiated in the brain constitute the qualities of which we are aware, it assumes an isomorphic relationship between the qualities in the brain and the qualities of which we are aware. However, the refutation of

[50] Thank you to the external moderators for this insight.

this assumption, and the acceptance of a non-isomorphic relationship as seen above, seems adequate to counter the structure combination problem.

Next, the quality combination problem of how a few primitive qualities could possibly yield the vast array of qualities of which we are aware. Again, dimensionality is central, but the response to this problem also requires reference to token monism or pluralism as discussed above.

If one assumes a token monist position, the ontological ultimates are not a few primitive qualities, but a single enqualitied tapestry which encompasses all the qualities in the universe, including those of which we are aware. If that is the case, the single enqualitied tapestry simply contains of all the qualities which are localized within it.

On the other hand, under the token pluralist position, ultimates combine to create a hyperdimensional ocean. As these ultimates are not themselves hyperdimensional, it seems that hypodimensional entities can combine to create a hyperdimensional system. For example, points can be arranged in such a way as to create a line, a plane, or a volume. This ability allows for the generation of complexity from simplicity, thereby allowing for the generation of rich phenomenal qualities from an austere ground. Just as points can combine to create complex lines, shapes and forms if combined in multiple dimensions, simple qualities can combine to create a vast array of qualities. And in contrast to PQ, there is no explanatory gap between the vast array of qualities and awareness of these qualities, as awareness of qualities is linked to consciousness, which is identical to protrusion into the dimension of consciounth.

4.9.5 - Critiquing the Term ‘Neutral’

One critique levelled at all forms of neutral monism regards the use of the term ‘neutral’. Mach, James and Russell all used terminology that leaned towards experience, when defining neutrality. ‘Sensations’, ‘pure experience’, and ‘sensations and percepts’ respectively, all tend towards the phenomenological and are thus critiqued as being non-neutral (Stubenberg, 2016 , 3). But what of neutrality as it pertains to HNM?

Critics might ask, if the physical is a hypodimensional aspect of the ontological ground, how could the ontological ground be ‘non-physical’ or neutral?[51] However, this critique assumes that neutral is defined as *non*-physical or *non*-mental, rather than *more than* physical or *more than*

[51] Thank you to Philosophia anonymous reviewer for this question.

mental. HNM utilizes the term 'neutral' in a way which is both *neither* physical *nor* mental as well as *more than* physical *and* mental.

This can be seen through an exploration of dimensionality in the spatio-temporal universe. As stated above, a cube can be seen as the hyperdimensional ground of a plane (see figure 1 above). However, the description of the relationship between a cube and plane is ambiguous. How would we define the dimensionality of a cube in relation to a plane? Is a cube 'non-planar'? In some sense it is, as 'planar' can be defined as 2-dimensional, whereas a cube is 3-dimensional, so a cube is therefore 'non-planar'. However, this description is not specific, as a line or a point are also 'non-planar'. In order to specifically describe the dimensional relationship, I have utilized the terms hypo- and hyper-dimensional to describe these relationships. A cube is therefore hyper-planar, while a line or a point are hypo-planar. So, to describe a cube as non-planar, may be technically correct, but it is also not specific. In order to describe a cube in relation to a plane, we would say that it is both non-planar as well as hyper-planar.

Given this understanding, we can see that the ontological ocean is *neither* mental *nor* physical, as well as *more than* mental *and more than* physical. In other words, the ontological ocean is 'neutral' in relation to both the mental and the physical.

Critics may still argue that the description of the ocean as both more than mental and more than physical is a sort of dual-aspect (rather than neutral) monism, as the ocean *contains* both mental and physical types of dimensions. Given that these two types of dimensions are irreducible, HNM should rather be classified as a type of dual-aspect monism. However, this critique assumes that the mental (or consciounth) dimensions and physical dimensions are primary and that the realm of space-time-consciounth is constituted from them. To clarify though, HNM argues that space-time-consciounth is fundamental, and that the dimensions of space, time and consciounth supervene on this realm.

Finally, it is worth noting that critiques of the term 'neutral' are critiques of the *classification*, rather than of the consistency, parsimony or explanatory power of HNM. The critical point of this dissertation is that the universe is fundamentally spatio-temporo-consciousal, and that the physical and mental supervene upon this fundamental realm. As such, critiques of 'neutrality' may be valid, but they would necessitate a reclassification, rather than a refutation of HNM.

5. Conclusion

In this dissertation, I have introduced multiple versions of hyperdimensional neutral monism. While these versions differ on numerous issues, they all rely on the notion of the non-spatial and non-temporal dimension of consciounth. Many of the arguments outlined above remain speculative, but I believe that the notion of a spatio-tempero-consciousal universe has the potential to address many of the issues related to the mind-body problem.

Future work is required to address and explore various issues relating to HNM. While much of the required work is philosophical in nature, other fields, such as art and science are also highly relevant. I address some avenues for future research in various fields below.

From a philosophical perspective, future work will focus on applying consciounth to other theories of consciousness. I briefly mentioned hyperdimensional physicalism and panpsychist HNM above - both of these versions require deeper exploration. Furthermore, the dimension of consciounth can also be applied to idealism, whereby the surface of the ontological ocean is still equated with the physical universe, but consciousness is equated with *any* spatio-tempero-consciousal existence within this ocean, rather than the protrusion of the surface alone. As such, the universe as a whole would be conscious (cosmic idealism), and the possibility of non-physical conscious entities would arise (in the form of existences beneath the surface). Issues of token monism/pluralism also require further exploration, specifically pertaining to quantum holism and quantum entanglement.

Furthermore, the notion of consciounth can be applied to various non-dual eastern philosophical traditions such as Advaita Vedhanta, Dzogchen, Yogacara, and others. Presumably, the application of consciounth to such theories has the potential to further bridge eastern and western philosophical traditions. Exploration of consciounth in relation to eastern philosophical traditions can take the form of both analytic research as well as meditative introspection.[52]

In addition to philosophical explorations, I am also interested in pursuing this line of inquiry from an artistic perspective. Given the centrality of the aquatic metaphor in the exploration of dimensionality, I believe that an artistic exploration of water, vortices and surfaces has great potential. This potential is two-fold. On the one hand, it could help to express the ideas explored

[52] Such introspection was critical to the development of many of the ideas presented in this dissertation. Explicit exploration of such introspection could be relevant to future work.

in this dissertation, and on the other hand, it could help to develop them. While the figures included in this dissertation are critical to explaining concepts of dimensionality, such figures are limited in their static, simplified nature. A dynamic artistic exploration of moving water could help to clarify some of the ideas regarding the relationship between water, vortices, and surfaces.

Equally important, though, is that the exploration can serve not to just explain the ideas, but also, to develop them. By exploring how water behaves when manipulated in various ways, ideas are likely to be further generated pertaining to how the ontological ocean could behave, including the behaviour of vortices and surfaces.[53] While the comparison between water and the ontological ocean is largely metaphorical, I believe that such an exploration could be invaluable in stimulating creativity and generating additional ideas relating to the ideas presented in this dissertation.

Finally, while outside of my personal skillset, an exploration of HNM from a scientific perspective could be illuminating. Such investigations could include explorations of how the consciounth dimension(s) can be expressed mathematically in relation to various string/brane theories; or how the probabilistic nature of quantum mechanics could be framed as a limited hypodimensional understanding of more fundamental deterministic hyperdimensional laws.

I also believe that there is potential for applying the protrusion of the surface of the ontological ocean to our understanding of the expansion of the universe. Briefly, the universe is expanding faster than cosmological models show that it 'should be' based on the amount of matter in the universe; And galaxies are held together tighter than cosmological models show that they 'should be' based on the amount of matter in them. These two observations have resulted in the scientific postulation of 'dark energy' and 'dark matter' respectively. It is worth noting that neither dark energy nor dark matter have been directly observed, however.

But if we are viewing the universe from the metaphorical eye of our collective vortex, and that vortex is expanding, perhaps when we see the universe expanding faster than our models predict, we are actually seeing our own expansion into the dimension of consciounth, combined with the expansion of the universe as it 'should be'. Likewise, when we see galaxies held

[53] This process could be similar to the architectural design process, whereby the act of drawing or modelling a building helps with the development of ideas. The drawing process is not only about communicating pre-conceived ideas, but also about developing ideas through the act of drawing.

together tighter than our models predict, perhaps we are seeing the unifying power of dimensional protrusion within those galaxies.

Recent astronomical observations indicate that the universe may not be expanding consistently in all directions. This observation 'would contradict one of the most basic underlying assumptions we use in cosmology today' (Dunbar, 2020). But perhaps the varying rates of the expansion of the universe and the varying cohesion of galaxies are the result of the physical universe expanding into the dimension of consciounth at varying rates. Perhaps consciousness is ubiquitous throughout the universe, and when we measure the expansion of the physical universe, we are partially measuring its expansion into the dimension of consciounth.

While this hypothesis is highly speculative, it serves to provide a sense of the potential applicability of HNM to scientific inquiry. And while the ideas expressed in this dissertation were specifically developed to address the mind-body problem, they may be broadly applicable in addressing other problems regarding the nature of our universe and our place within it.

REFERENCES

Abbott, E.A., 2015. *Flatland*. Princeton University Press.

Banks, E.C., 2014. *The realistic empiricism of Mach, James, and Russell: Neutral monism reconceived*. Cambridge University Press.

Banks, E.C., 2010. Neutral monism reconsidered. *Philosophical Psychology*, *23*(2), pp.173-187.

Casey, J., 2012. *Exploring curvature*. Springer Science & Business Media.

Bedau, M.A., 1997. Weak emergence. *Philosophical perspectives*, *11*, pp.375-399.

Bloom, P,. 2004. Natural Born Dualists. Edge, viewed 18 September, 2021. https://www.edge.org/conversation/paul_bloom-natural-born-dualists

Cameron, Ross, "Infinite Regress Arguments", *The Stanford Encyclopedia of Philosophy* (Fall 2022 Edition), Edward N. Zalta & Uri Nodelman (eds.), URL = <https://plato.stanford.edu/archives/fall2022/entries/infinite-regress/>.

Carroll, S., 2017. *The big picture: on the origins of life, meaning, and the universe itself*. Penguin.

Carter, P.J., 2014. Consciousness and Perception in Higher-Dimensional Quantum Space-time. *NeuroQuantology*, *12*(1).

Chadha, M., 2019. Abhidharma Panprotopsychist Metaphysics of Consciousness. In *The Routledge Handbook of Panpsychism* (pp. 25-35). Routledge.

Chalmers, D., 2021. Idealism and the mind-body problem 1. In *The routledge Handbook of idealism and immaterialism* (pp. 591-613). Routledge.

Chalmers, D.J., 2017a. The combination problem for panpsychism. *Panpsychism: contemporary perspectives*, *179*, p.214.

Chalmers, D., 2017b. The hard problem of consciousness. *The Blackwell companion to consciousness*, pp.32-42.

Chalmers, D., 2015. Panpsychism and panprotopsychism. *Consciousness in the physical world: Perspectives on Russellian monism*, pp.246-276.

Chalmers, D.J., 2006. Strong and weak emergence. *The re-emergence of emergence*, pp.244-256.

Chalmers, D.J., 1996. *The conscious mind: In search of a fundamental theory*. Oxford Paperbacks.

Churchland, P.M., 1981. Eliminative materialism and propositional attitudes. *the Journal of Philosophy*, *78*(2), pp.67-90.

Coleman, S., and Goff, P 2020. Russellian Monism in U. Kriegel (ed.) Oxford Handbook of the Philosophy of Consciousness. Oxford: Oxford University Press.

Coleman, S. "Neutral Monism: A Saner Solution to the Problem." *Philosophy Now* 121 (2017): 9-11.

Coleman, S., 2016. Panpsychism and Neutral Monism. *Panpsychism: Contemporary Perspectives, ed. Godehard Bruntrup and Ludwig Jaskolla (Oxford: Oxford University Press, 2017)*, pp.249-282.

Coleman, S., 2014. The real combination problem: Panpsychism, micro-subjects, and emergence. *Erkenntnis*, *79*(1), pp.19-44.

Coleman, S., 2012. Mental Chemistry 1: Combination for Panpsychists. *dialectica*, *66*(1), pp.137-166.

Davidson, D., 1999. Anomalous monism. *Aporia*, *20*(2-2010).

Dennett, D.C., 1991. Real patterns. *The journal of Philosophy*, *88*(1), pp.27-51.

Downing, Lisa, "George Berkeley", *The Stanford Encyclopedia of Philosophy* (Fall 2021 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/fall2021/entries/berkeley/>.

Dunbar, B., 2020. Universe's Expansion May Not Be The Same In All Directions. NASA, viewed 2 September, 2022. https://www.nasa.gov/mission_pages/chandra/news/universe-s-expansion-may-not-be-the-same-in-all-directions.html

Frankish, K., 2016. Illusionism as a theory of consciousness. *Journal of Consciousness Studies*, *23*(11-12), pp.11-39.

Frenkel, J., 2022. Hyperdimensional Neutral Monism: A Dimensional Approach to the Mind–Body Problem. *Philosophia*, pp.1-36.

Goff, P., 2017. Panpsychism. *The Blackwell Companion to Consciousness*, pp.106-124.

Goff, P., 2015. Against constitutive Russellian monism. *Consciousness in the physical world: Perspectives on Russellian monism*, pp.370-400.

Goff, P., 2009. Can the panpsychist get around the combination problem?. *Mind that abides: Panpsychism in the New Millenium;[ed. D. Skrbina]. Amsterdam: Benjamins*, pp.129-135.

Goff, P., 2006. Experiences don't sum. *Journal of Consciousness Studies*, *13*(10-11), pp.53-61.

Graham, George, "Behaviorism", *The Stanford Encyclopedia of Philosophy* (Spring 2023 Edition), Edward N. Zalta & Uri Nodelman (eds.), forthcoming URL = <https://plato.stanford.edu/archives/spr2023/entries/behaviorism/>.

Hoffman, D., 2019. *The case against reality: Why evolution hid the truth from our eyes*. WW Norton & Company.

Hume, D., 2003. *A treatise of human nature*. Courier Corporation.

Frank, J., 1982. Epiphenomenal qualia. *The Philosophical Quarterly*, *32*(127), p.127.

James, W., Burkhardt, F., Bowers, F. and Skrupskelis, I.K., 1890. *The principles of psychology* (Vol. 1, No. 2). London: Macmillan.

Kaku, M., 2016. *Hyperspace: A scientific odyssey through parallel universes, time warps, and the tenth dimension*. Oxford University Press.

Kaku, M., 2012. *Introduction to superstrings and M-theory*. Springer Science & Business Media.

Kastrup, B., 2018. The universe in consciousness. *Journal of Consciousness Studies*, *25*(5-6), pp.125-155.

Kastrup, B., 2017a. Transcending the brain. *Scientific American*, *29*.

Kastrup, B., 2017b. An ontological solution to the mind-body problem. *Philosophies*, *2*(2), p.10.

Kastrup, B., 2017c. On the plausibility of idealism: Refuting criticisms. *Disputatio*, *9*(44).

Kastrup, B., 2014. *Why materialism is baloney: How true skeptics know there is no death and fathom answers to life, the universe, and everything*. John Hunt Publishing.

Levine, J., 1983. Materialism and qualia: The explanatory gap. *Pacific philosophical quarterly*, *64*(4), pp.354-361.

Lewis, D., 1980. Mad pain and Martian pain. *Readings in the Philosophy of Psychology*, *1*, pp.216-222.

Lewis, D.K., 1966. An argument for the identity theory. *The Journal of Philosophy*, *63*(1), pp.17-25.

Lycan, W.G., 2003. The mind-body problem. *The Blackwell guide to philosophy of mind*, pp.47-65.

Mathews, F., 2011. Panpsychism as paradigm. *The Mental as Fundamental: New Perspectives on Panpsychism*, pp.141-156.

Miller, G., 2018. Can Subjects Be Proper Parts of Subjects? The De-Combination Problem. *Ratio*, *31*(2), pp.137-154.

Mørch, H.H., 2017. The evolutionary argument for phenomenal powers. *Philosophical Perspectives*, *31*(1), pp.293-316.

Nagel, T., 1974. What is it like to be a bat. *Readings in philosophy of psychology*, *1*, pp.159-168.

Nagasawa, Y. and Wager, K., 2017. Panpsychism and priority cosmopsychism. *Panpsychism: Contemporary Perspectives,* pp. 113-129

Nelson, Michael, "Existence", *The Stanford Encyclopedia of Philosophy* (Winter 2022 Edition), Edward N. Zalta & Uri Nodelman (eds.), URL = <https://plato.stanford.edu/archives/win2022/entries/existence/>.Robinson, H., 2020. Dualism.

Robinson, Howard, "Dualism", *The Stanford Encyclopedia of Philosophy* (Spring 2023 Edition), Edward N. Zalta & Uri Nodelman (eds.), forthcoming URL = <https://plato.stanford.edu/archives/spr2023/entries/dualism/>.

Ramsey, William, "Eliminative Materialism", *The Stanford Encyclopedia of Philosophy* (Spring 2022 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/spr2022/entries/materialism-eliminative/>..

Roelofs, L., 2019. Can we sum subjects? Evaluating Panpsychism's hard problem. In *The Routledge handbook of Panpsychism* (pp. 245-258). Routledge.

Schaffer, J., 2010. Monism: The priority of the whole. *The Philosophical Review*, *119*(1), pp.31-76.

Seager, W., 2002. *Theories of consciousness: an introduction*. Routledge.

Shani, I., 2015. Cosmopsychism: A holistic approach to the metaphysics of experience. *Philosophical Papers*, *44*(3), pp.389-437.

Shani, I. and Keppler, J., 2018. Beyond combination: how cosmic consciousness grounds ordinary experience. *Journal of the American Philosophical Association*, *4*(3), pp.390-410.

Shani, I., 2021. Eden Benumbed: A Critique of Panqualityism and the Disclosure View of Consciousness. *Philosophia*, pp.1-24.

Smart, J. J. C., "The Mind/Brain Identity Theory", *The Stanford Encyclopedia of Philosophy* (Winter 2022 Edition), Edward N. Zalta & Uri Nodelman (eds.), URL = <https://plato.stanford.edu/archives/win2022/entries/mind-identity/>.

Stoljar, Daniel, "Physicalism", *The Stanford Encyclopedia of Philosophy* (Summer 2022 Edition), Edward N. Zalta (ed.), URL = <https://plato.stanford.edu/archives/sum2022/entries/physicalism/>.

Strawson, G., 2017. Physicalist panpsychism. *The Blackwell Companion to Consciousness, 2nd edition. New York: Wiley-Blackwell*, pp.374-90.

Stubenberg, Leopold and Donovan Wishon, "Neutral Monism", *The Stanford Encyclopedia of Philosophy* (Spring 2023 Edition), Edward N. Zalta & Uri Nodelman (eds.), forthcoming URL = <https://plato.stanford.edu/archives/spr2023/entries/neutral-monism/>.

Tononi, G., 2012. The integrated information theory of consciousness: an updated account. *Archives italiennes de biologie*, *150*(2/3), pp.56-90.

Van Gulick, Robert, "Consciousness", *The Stanford Encyclopedia of Philosophy* (Winter 2022 Edition), Edward N. Zalta & Uri Nodelman (eds.), URL = <https://plato.stanford.edu/archives/win2022/entries/consciousness/>.

Velmans, M. and Nagasawa, Y., 2012. Introduction to monist alternatives to physicalism. *Journal of Consciousness Studies*, *19*(9-10), pp.7-18.

Wertheim, M., 2018. Radical Dimensions. *Aeon*, viewed 6 July, 2021. https://aeon.co/essays/how-many-dimensions-are-there-and-what-do-they-do-to-reality

Wheeler, J.A., 2018. *Information, physics, quantum: The search for links* (pp. 309-336). CRC Press.