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HYLOMORPHISM AND THE MIND-BODY RELATION

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DECLARATION

I, Kevan Norris, declare that the work presented in this thesis is my own.

ABSTRACT

In *Structure and the Metaphysics of Mind* Jaworski argues that “hylomorphism elegantly solves a number of philosophical problems in metaphysics and the philosophy of mind”. Relying on his hylomorphic account of structure, Jaworski develops a metaphysical theory of the mind-body relation whereby minded creatures like us are quantities of physical materials structured in appropriate ways. Our structured parts have powers. Further structuring activity coordinates the exercise of these powers, enabling us to walk, talk, think and feel. Jaworski claims to be able to rely on hylomorphic structure in this way to provide a theory of the mind-body relation that deserves to be taken at least as seriously as more familiar theories in the philosophy of mind. The dissertation considers this claim, concentrating on a comparison between Jaworski’s theory and the mind-body theories of his physicalist rivals. The dissertation first sets out the metaphysical context for assessing Jaworski’s claim by describing the compositional ontological framework that provides the background to the theories of both Jaworski and the physicalists. Having set out this metaphysical context the dissertation carries out an assessment of the competing theories. The first stage of the assessment considers the relative merits of Jaworski’s general hylomorphic metaphysics and the metaphysics of the physicalists, in particular, whether their metaphysics have the ontological resources to provide an acceptable principle of composition. The second stage compares their competing mind-body theories, in particular, their solutions to the problem of mental causation and the hard problem of consciousness. The dissertation concludes that Jaworski’s mind-body theory does deserve to be taken as seriously as the theories of his physicalist rivals but that, ultimately, the merits of Jaworski’s theory depends on whether he is able to dispel concerns over the realist claims that he makes in relation to his hylomorphic structures.

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1. INTRODUCTION

1.1 In *Structure and the Metaphysics of Mind - How Hylomorphism Solves the Mind-Body Problem* Jaworski argues that “hylomorphism elegantly solves a number of philosophical problems in metaphysics and the philosophy of mind”¹. Relying on his hylomorphic account of structure, Jaworski develops a metaphysical theory of the mind-body relation whereby minded creatures like us are quantities of physical materials structured in appropriate ways. Our structured parts - hearts, brains, etc - have powers. Further structuring activity coordinates the exercise of these powers, enabling us to walk, talk, think and feel. Jaworski claims to be able to rely on structure in this way to provide a theory of the mind-body relation that provides elegant solutions to the various mind-body problems. His aim is to show that his hylomorphic mind-body theory “should be taken seriously - at least as seriously as more familiar theories in the philosophy of mind such as non-reductive physicalism, emergentism, and Russellian monism”². In this dissertation I consider how far Jaworski achieves this aim. I concentrate on Jaworski’s rivalry with the physicalists: does Jaworski show that his hylomorphic theory of the mind-body relation deserves to be taken at least as seriously as physicalist mind-body theories? Theories of the mind-body relation have to be considered within the context of a general metaphysical framework. So when contrasting Jaworski’s hylomorphic theory with the physicalist alternatives I look at the competing hylomorphic and physicalist metaphysical worldviews. This not only allows me to assess whether Jaworski’s mind-body theory deserves to be taken at least as seriously as the physicalist theories but also casts light on the ontological nature of Jaworski’s dispute with the physicalists. The rest of this Section provides an overview of the dissertation.

1.2 A metaphysical theory of the mind-body relation provides an account of the relation between mental and physical phenomena. This can be seen as part of the overall metaphysical project of providing a consistent view of the fundamental nature of reality. As Lowe says “reality as a whole is unitary and necessarily self-consistent”³. So when psychology and the physical sciences describe mental and physical phenomena they are describing different aspects of this same reality and must be at least consistent with each other. A metaphysical theory of the mind-body relation provides a

¹ Jaworski (2016), p. 336.

² Jaworski (2016), p. 336.

³ Lowe (2002), p.3.

metaphysical framework within which this consistency can be achieved. Both Jaworski and his physicalist rivals can agree to a compositional ontology whereby reality consists of fundamental physical materials arranged in varying degrees of complexity. And they can agree that this fundamental reality can be described in different ways depending on whether the description is concerned with the behaviour of the fundamental physical materials, and is thus part of physics, or with the behaviour of complex arrangements of such materials, and is thus part of the special sciences, including psychology. Where Jaworski and the physicalists part company is over the ontological implications of the special sciences. This leads to different ontologies - different worldviews of the fundamental nature of reality. This difference in their ontological commitments, in turn, leads to different theories of the mind-body relation. Physicalists (at least according to Jaworski - see below) claim that everything can be exhaustively described by the most empirically adequate physics. This means that for them the phenomena described by psychology must not be distinct from, must be nothing over and above, the phenomena described by physics. Jaworski's ontology, on the other hand, includes hylomorphic structure in addition to the phenomena included in the physicalists' ontology, so that his theory of the mind-body relation can draw on these extra ontological resources.

1.3 A way of assessing these competing theories of the mind-body relation is required. I carry out the assessment in two related stages. First, I consider the merits of Jaworski's hylomorphism as a general metaphysical theory or worldview. In particular, I consider whether Jaworski's hylomorphic principle of composition is preferable to the principles of composition available to the physicalists and thus provides support for his general metaphysical theory. If his hylomorphic theory of the fundamental nature of reality is preferable to the competing physicalist theories then this provides one basis for preferring his hylomorphic theory of the mind-body relation, being a specific application of his general hylomorphic ontology. Secondly, I consider how far Jaworski's hylomorphic theory of the mind-body relation is an attractive theory, distinct from and potentially superior to the physicalist theories. In particular, does Jaworski's mind-body theory enable him to provide a better solution to the problem of mental causation and

the hard problem of consciousness⁴. This two stage assessment is related. A general metaphysical theory of the fundamental nature of reality must be judged, in part, by how far it successfully accounts for the place of the mind within a physical world. And a theory of the mind-body relation must be judged, in part, by reference to its place within an acceptable general metaphysical theory. My main focus throughout is on clarifying the nature of the ontological disagreement between Jaworski and the physicalists concerning the mind-body relation.

1.4 The dissertation is arranged as follows:

In Section 2 I describe a compositional ontological framework for the purpose of providing the background for the general metaphysical theories of Jaworski and the physicalists and for the development of their theories of the mind-body relation, and consider the different ways in which the framework can be interpreted.

In Section 3, I describe physicalist interpretations of the framework and the implications this has for physicalist theories of the mind-body relation.

In Section 4 I describe Jaworski's interpretation of the framework and set out Jaworski's hylomorphic theory of the mind-body relation.

In Section 5 I carry out the first stage of the assessment of Jaworski's hylomorphism, considering its merits as a general metaphysical theory of the nature of reality in the light of some of the arguments of its critics.

In Section 6 I carry out the second stage of the assessment, considering the arguments for Jaworski's theory of the mind-body relation, in particular how it purports to solve the mind-body problems relating to mental causation and consciousness. This allows me to assess Jaworski's claim that his mind-body theory deserves to be taken at least as seriously as the more familiar physicalist

⁴ This two stage assessment follows Jaworski's argument for his theory of the mind-body relation in Jaworski (2011). At p. 309 of that work he says: "There are at least two arguments in favour of a hylomorphic theory of the mind. The first appeals to the general hylomorphic worldview. Since there is good reason to endorse hylomorphism in general ..., says the argument, there is good reason to endorse a hylomorphic approach to mental phenomena specifically. The second argument claims that a hylomorphic theory of mind does a better job solving mind-body problems than competing theories ...".

theories. I conclude that Jaworski's theory deserves to be taken seriously but that the potential advantages of his theory over the theories of his physicalist rivals ultimately depends on the credibility of his structural realism, and that there are grounds for questioning what I refer to as his realist credentials.

2. A COMPOSITIONAL ONTOLOGICAL FRAMEWORK

2.1 Jaworski says that hylomorphism, like physicalism, is committed to the claim that structured individuals are ultimately "exhaustively decomposable into fundamental physical materials"⁵. This is part of the intuitively attractive view that all physical things, such as molecules, tables, and minded creatures like us, are composed of the same type of physical material, the material that will be exhaustively described by a future empirically adequate physics. At the same time this view on the composition can make it difficult to explain how minded creatures like us, with our mental properties, fit into a physical world so conceived. In developing an ontological framework within which to consider hylomorphism and physicalism I will adopt this compositional assumption. Developing this type of framework is first and foremost a metaphysical project, albeit one informed by science. The different interpretations of the framework set out the metaphysical possibilities, leaving it to science and experience to tell us which of the metaphysical possibilities are plausibly true in the actual world⁶. In developing the framework it is necessary to say something about the nature of the basic physical building blocks that are assumed to be its basic constituents, the principle of composition determining when the building blocks compose a composite object, and the view to be taken of the properties that characterise the building blocks and composite objects. For the purpose of developing the framework I will, like Jaworski, adopt a substance-attribute ontology, with substances and attributes being irreducibly conceptually distinct and fundamental. And, again like Jaworski, I will use the term 'property' in place of 'attribute' and understand it to cover both monadic properties and relations, n-adic properties (although sometimes I will refer to properties and relations if this makes things clearer). A state on this view can be treated as an object instantiating a property at a particular time or during a particular period of time. Events can then be treated as changes of states.

⁵ Jaworski (2016), p. 251.

⁶ As Lowe says: "Knowing how the world *could* be in respect of its fundamental structure, we must judge as best we can how it *is* by determining how well our experience can be accommodated with this or that alternative metaphysical possibility as regards that structure" - Lowe (1998), p.23 (italics in original).

Basic building blocks of reality

2.2 I will assume that there are fundamental physical entities, the basic building blocks, that are capable of composing composite wholes. Further I will treat these fundamental entities as basic particles, to be understood as simples, that is, entities without proper parts⁷. These simples are simple substances, non-composite bearers of properties. I will refer to the properties characterising the basic particles as basic properties. I will then refer to composites of such particles as objects, composite substances, composite bearers of properties⁸. In keeping with what I have said above about the development of the framework being informed by science, the reference to the fundamental particles can be treated as a placeholder for whatever microscopic entities physics eventually discovers to be actually down there.

Principle of composition

2.3 Once the basic building blocks are in place the next part of the process of constructing the framework is to adopt a principle of composition. This can be discussed in terms of van Inwagen's special composition question: when is it true that for some object y, the xs compose the y?⁹. If we take 'the xs' to be a plural referring expression referring to two or more basic particles, then this question is asking in what circumstances an arrangement of such particles compose an object. Insofar as an arrangement of particles compose an object - y - that object will be a composite object with the particles as its proper parts. A mereological universalist endorses unrestricted composition whilst a mereological nihilist denies any form of composition, recognising only mereological simples. Van Inwagen's answer to his special composition question falls between these two extremes, a position of restricted composition. For van

⁷ As Lowe says "it is natural to assume that although an object's component parts may themselves be composite objects ... there must eventually be an end to such a series of whole-part relations, the terminus being provided by objects which are by their very nature simple or non-composite". Lowe (2002), p. 60.

⁸ Jaworski's hylomorphism is not committed to the fundamental building blocks being particulate on the basis that it is for the "relevant empirical disciplines to tell us what their natures are" - Jaworski (2016), p. 107. He prefers to use the term 'fundamental physical materials' to indicate his neutrality on the basis that this leaves it open whether such entities are particulate or continuous. I find it easier to refer to, and to conceive of, the basic building blocks as if they were particulate. I do not, however, intend anything substantive to turn on this departure from Jaworski for present purposes.

⁹ See van Inwagen (1990), p. 30.

Inwagen the point at which an arrangement of particles - the xs - compose an object is when the arrangement reaches a level of complexity at which it is characterised by a novel property, that is, a property that cannot be understood in terms of the joint effect of the properties of the constituent basic particles. I will refer to such novel properties as emergent properties. Jaworski develops a principle of composition that is similar to van Inwagen's. It is possible to adopt a position of restricted composition without relying on emergent properties. Thus physicalists, who do not admit emergent properties within their ontology, can set out a principle of composition in purely physicalist terms. The issue for the physicalists, however, is whether they can provide a principle of composition in this way which is otherwise acceptable on ontological grounds. In Section 5 I say more about emergent properties and look in detail at van Inwagen's, Jaworski's and possible physicalist principles of composition. I suggest an argument on Jaworski's behalf seeking to justify his hylomorphism on the basis that it provides ontological resources for a principle of composition that is preferable to any rival physicalist principles.

Properties and predicates

2.4 This brings us to the properties that may be recognised in the kind of compositional ontological framework that I am developing and the predicates that denote those properties. This is central to theories of the mind-body relation given that, within the context of the ontological framework that I am developing, such theories are concerned with the relation between mental and physical properties and the predicates that denote them. Predicates are part of our language, our conceptual schemes. I am assuming that a predicate truly applies to a particle or object in virtue of some property or properties that it instantiates. This does not imply an abundant view of properties, the view that there is a property corresponding to every predicate we can construct. Like many philosophers, Jaworski adopts a sparse view of properties. This view follows from what he calls the Eleatic Principle, the view that the only material objects that exist are ones that can enter into causal relations and the only properties that exist are ones that empower objects to enter into those relations¹⁰. As Jaworski points out, this has the implication that properties do not correspond to predicates one to one, that not every predicate denotes a property, and different predicates may denote the same

¹⁰ See Jaworski (2016), p. 30. He is not concerned with abstract objects and properties.

property¹¹. I will adopt these views of Jaworski's on properties and predicates for the purpose of developing the ontological framework and comparing Jaworski's hylomorphism with the metaphysical theories of the physicalists. And I will refer to sparse properties when I need to emphasise that I am talking about 'real', causally efficacious, properties.

2.5 A distinction relating to properties that will be relevant in what follows is the distinction between the levels and orders of properties, a distinction drawn, for example, by Kim¹². A property's level depends upon what level of object it characterises¹³. The basic properties that characterise the fundamental particles are at the same level, the properties that characterise me are at the same level, and so on. At each level there may be a number of distinct properties. Some of the properties at the same level may be arranged hierarchically in orders whilst others may not. For example, if we treat '... is wearing blue jeans' and '... is wearing a blue jumper' as predicates that denote properties that characterise me independently of each other, then these are distinct first order properties at the same level with no hierarchy. In other cases, however, there may be a hierarchy of higher and lower order properties at the same level. This hierarchy can be expressed in terms of supervenience, with the higher order property supervening on the lower order property. Three points should be noted in relation to higher and lower order properties that will be relevant in the following discussion -

- (1) By higher order property is not meant a property had by another property. In this context a higher order property is a property of an object.
- (2) On one view higher order properties are not really properties at all. Jaworski describes such properties as logical constructions - "properties whose definitions quantify over other properties. If $F_1, F_2 \dots, F_n$ are properties, we might define a property, H , by stipulating that something has H if and only if it has *some* F -property or other"¹⁴. As Jaworski says, the Eleatic Principle implies that these so-called properties do not exist. H is not a distinct higher order

¹¹ The implications of the Eleatic Principle for the sparseness of properties depends on the view of causation with which it is coupled. As will be seen below, Jaworski couples it with causal pluralism, which results in a less sparse view of properties than may first appear to be the case.

¹² See, for example, Kim (1998), pp. 80 et seq.

¹³ The idea of levels of objects relates to the layered view of reality discussed later in this Section.

¹⁴ Jaworski (2016), p. 88 (italics in original).

property over and above the F-properties, rather 'H' is a higher order predicate that picks out the F-properties¹⁵.

- (3) Insofar as supervenience is a relation between sets of properties it is potentially misleading to speak of higher order properties, construed as logical constructions, supervening on lower order properties. But if higher order properties are treated as properties that are distinct from lower order properties then the sense in which they are distinct is different from the sense in which, for example, the properties denoted by '... is wearing blue jeans' and '... is wearing a blue jumper' are distinct. Here Stoljar's analysis of distinctness in terms of weak and strong modal distinctness is useful¹⁶. Two properties F and G are weakly modally distinct if and only if it is metaphysically possible that F is instantiated and G is not or it is metaphysically possible that G is instantiated and F is not, but not both. This will be the case where, for example, F is multiply realised by a set of lower level properties including G. F and G are strongly modally distinct if it is metaphysically possible that F is instantiated and G is not and it is metaphysically possible the G is instantiated and F is not. Here neither of the properties supervene with metaphysical necessity on the other. They are contingently related, at most there is nomological supervenience based on contingent laws of nature¹⁷. I will use 'ontologically distinct' in relation to properties to mean distinctness generally, whether weak or strong modal distinctness. The alternative to two properties being ontologically distinct is thus being numerically identical.

As will be apparent from this analysis of distinctness, a set of properties, P, supervenes upon another set of properties, P*, if no two things can differ with respect to their P properties without also differing with respect to their P* properties. The modal strength of a supervenience relation may be metaphysical or nomological depending on whether the necessary co-variation is a matter of metaphysical necessity or nomological

¹⁵ See Jaworski (2016), p. 91. Jaworski refers with approval to Kim (see Kim (1998), p. 104). Kim, who advocates a sparse conception of properties, also says that it is clearer to refer to higher order predicates rather than higher order properties.

¹⁶ See Stoljar (2008).

¹⁷ There is potentially a third type of distinctness not covered by the above analysis. This could be called minimally modally distinct, where two properties - F and G - are minimally modally distinct if and only if they are not numerically identical but it is not metaphysically possible that F is instantiated and G is not and it is not metaphysically possible that G is instantiated and F is not. Jaworski, for example, considers this type of distinctness in his discussion of necessitation dualism - see Jaworski (2016), p. 243. I will ignore minimal modal distinctness in what follows.

necessity, obtaining given specified laws of nature. Supervenience also comes in different varieties. Where relevant, when I refer to a supervenience relation I will specify its modal strength or variety, as I did when setting out the analysis of distinctness.

2.6 There are different theories about the nature of properties. In addition to adopting a sparse view of properties, Jaworski treats properties as particulars (tropes) rather than universals¹⁸. More importantly for present purposes, he adopts the identity theory of powers according to which one and the same property can be described using a dispositional or non-dispositional vocabulary, the different vocabularies bringing out the different theoretical roles that the property can play. This contrasts with theories that treat a property as either dispositional or non-dispositional (categorical) but not both. The identity theory of powers will be important in Section 6 when I discuss the hard problem of consciousness. Jaworski's theory of powers also provides that every property essentially empowers the objects that it characterises to enter into the same causal relations in every possible world. This means that for Jaworski laws of nature are metaphysically necessary, so that nomological necessity is a species of metaphysical necessity. Jaworski thus expresses the supervenience relations that figure in his hylomorphic theory in terms of metaphysical necessity¹⁹.

Explanatory and ontological pluralism

2.7 I have said that the mind-body relation concerns the relation between mental and physical properties and the predicates that denote them. Central to explaining this relation is the distinction between explanatory levels and ontological levels. For the purpose of developing the ontological framework I will assume that an empirically adequate future physics will be able to exhaustively describe the basic level of the framework. Such a physics can be said to have an ontological commitment to the particles referred to by its singular terms and the basic properties denoted by its predicates. And we can be said to accept such particles and properties into our ontology when we accept physics and therefore its ontological commitments. This approach to ontological commitment is behind Jaworski's ontological naturalism, which he describes as follows: "If our best empirical descriptions, explanations and methods posit entities of kind K, then that gives us good prima facie reason to think that Ks

¹⁸ See Jaworski (2016), chapter 3.

¹⁹ Jaworski discusses these last two points in Jaworski (2016), chapter 4.

exist”²⁰. Insofar as we have one conceptual scheme at the basic level, physics, with one set of ontological commitments, we have, but only if we confine our attention to this level alone, explanatory and ontological monism.

2.8 As the basic particles combine to form arrangements of increasing complexity we eventually have particles arranged molecule-wise. At this level we have another conceptual scheme, chemistry, resulting in explanatory pluralism. Explanatory pluralism gives rise to the following metaphysical question:

Question Q: Are the two schemes just different ways of describing the ontologically basic level described by physics or does the second conceptual scheme have ontological commitments to properties or objects over and above those to which the first conceptual scheme, physics, is committed²¹?

In order to answer this question it is necessary to say what is meant by the reference to there being properties and objects ‘over and above’ those described by the first conceptual scheme. So far as properties are concerned I will understand this phrase in terms of ontological distinctness. Thus, in relation to chemistry, the question is whether at the relevant level of complexity we are committed to distinct molecular properties, that is, to sparse properties that are numerically distinct from the basic properties of physics²². There is then the parallel question in relation to objects - are we committed to numerically distinct (composite) objects, molecules, over and above the basic particles that compose them. Ontological pluralism may thus consist of property pluralism and/or object pluralism. The move from the explanatory pluralism associated with the special sciences to ontological pluralism is what generates the layered view of reality, where complex arrangements of basic particles are treated as composing atoms, with atomic properties denoted by the predicates of atomic physics, complex arrangements of atoms are treated as composing molecules, with the molecular properties of chemistry, and complex arrangements of molecules are treating as composing organisms, with properties denoted by the predicates of biology and, ultimately, psychology. Whether we are committed to higher level properties and

²⁰ Jaworski (2016), p. 19.

²¹ As Kim says: “Metaphysics is the domain where different languages, theories, explanations and conceptual systems come together and have their mutual ontological relations sorted out and clarified” - Kim (1998), p. 66.

²² This could be expressed in terms of truth makers: are chemical descriptions containing chemical predicates made true by distinct chemical properties or only by properties denoted by the predicates of physics?

objects will need to be informed by science but science alone cannot determine the answer. That will depend on the metaphysical framework within which the question is posed, in particular, on the principle of composition and view of properties that is part of the interpretation of that framework.

2.9 Property pluralism may be defined as follows:

Property pluralism: There are the basic properties of physics and sparse non-basic properties, and the non-basic properties and basic properties are distinct²³.

The reference to distinctness in this definition includes both strong and weak modal distinctness. On this reading property monism is the position that there are no sparse non-basic properties distinct from the basic properties of physics. Property pluralism thus requires what I referred to above as emergent properties. Whether property pluralism is necessary or sufficient for ontologically distinct objects over and above those at the basic level, object pluralism, will depend on the applicable principle of composition. An ontology that did not allow for ontologically distinct objects - object monism - would constitute mereological nihilism. I discuss these issues in Section 5.

The mental and the physical within the ontological framework

2.10 The rest of this dissertation is essentially concerned with question Q so far as it concerns the relation between our psychological conceptual scheme, on the one hand, and physics on the other hand: Is our psychological conceptual scheme just a different way of describing the ontologically basic level described by physics or does psychology have ontological commitments to properties or objects over and above those to which physics is committed? Answering this question within the ontological framework that I have described will explain how minded creatures like us fit into a physical world.

2.11 The classification of a property as mental or physical can be taken to depend on the classification of the predicates which denote it, and the classification of those predicates depends, in turn, on the classification of the conceptual scheme of which the predicates form part. The conceptual scheme relevant so far as the mind is concerned

²³ This is a generalised version of Jaworski's definition of property dualism, which covers only the relation between mental and physical properties - see Jaworski (2016), p. 220.

is psychology, with its psychological predicates and properties. Chalmers distinguishes two broad conceptions of the mental, what he calls the psychological concept, using 'psychological' in a narrower sense than I am using it, and the phenomenal concept²⁴. The psychological concept in Chalmers' narrow sense is the mental as the causal or explanatory basis for behaviour, as when we cite a person's beliefs and desires to explain why they raise their arm. Jaworski refers to this as the public conception of the mental, with a focus on the notions of intentionality, mental representation, propositional content and rationality²⁵. The phenomenal concept of the mental is the mental as conscious experience, the 'something-it-is-likeness'. Jaworski refers to this as the private conception of the mental, with a focus on the notions of first-person authority, subjectivity, and phenomenal consciousness (qualia). Using these concepts, what it means for a mental property to be psychological is for it to play a particular causal or explanatory role, and what it means for a mental property to be phenomenal is for it to have a 'what-it-is-likeness', to feel a certain way. Some mental properties, such as pain, will have both a psychological and phenomenal aspect. When I speak of psychology as a conceptual scheme I intend this to cover our theories about mental properties generally. I will assume that the phenomenal and psychological aspects of the mental exhaust the mind and that an adequate theory of the mind-body relation should deal with both aspects.

2.12 In parallel with the approach taken in relation to mental properties, the reference to physical properties should be construed as referring to the properties denoted by predicates in our physical conceptual scheme. The reference to our physical conceptual scheme is, however, ambiguous. In addition to physics we have special sciences like chemistry and biology. If we restrict the reference to our physical conceptual scheme to physics then the physical properties are the properties denoted by the predicates of physics, the basic properties. If we widen the reference to the physical special sciences then the reference to physical properties potentially includes distinct chemical and biological properties as well. Which approach is taken will affect what it means for a physicalist to say that there are no mental properties over and above the physical properties.

²⁴ See Chalmers (1996), chapter 1.

²⁵ See Jaworski (2011), chapter 2.

3. PHYSICALISM

3.1 In the first part of this Section I set out the physicalist interpretation of the ontological framework outlined in Section 2. This will result in a more austere ontology than Jaworski's hylomorphism, which will be described in Section 4. The challenge for the physicalists is to develop an acceptable theory of the mind-body relation within the confines of this austere ontology. In the second part of this Section I consider the general strategies available to the physicalists when developing their mind-body theories.

Physicalist worldview

3.2 In the ontological framework described in Section 2 everything is physical in the sense that it is either a basic particle characterised by basic properties or an object composed exclusively of basic particles. This is not enough, however, to guarantee that all of the properties within the framework are basic properties. Without further restrictions a composite object may still be characterised by chemical, biological or mental properties that are ontologically distinct from the basic properties. On some definitions of physicalism, theories that include special science properties that are only weakly modally distinct from basic physical properties are still classified as physicalist theories. Physicalism is only taken to rule out strongly modally distinct special science properties. Kim refers to this type of physicalism as 'minimal physicalism', representing the idea that there are no free-floating (that is, strongly modally distinct) mental properties unanchored in the physical world, as is the case with extreme forms of dualism, such as Cartesian dualism²⁶.

3.3 For Jaworski, however, physicalism requires the rejection of any form of property pluralism²⁷. I will adopt Jaworski's definition of physicalism. This will be useful when comparing physicalism, as so understood, with Jaworski's hylomorphism. On Jaworski's definition, physicalism treats all properties as either basic properties or properties that can be identified with basic properties. Given the assumption that an empirically adequate future physics will be able to exhaustively describe the basic level, this results in what Jaworski calls the core thesis of physicalism, the claim that "everything can be exhaustively described and explained by the most empirically

²⁶ See Kim (1998), p.15.

²⁷ See Jaworski (2016), chapter 11.

adequate theories in current or future physics”²⁸. It is, however, implicit in the classification of properties according to the predicates that denote them that being mental (or chemical or biological) and being physical are not mutually exclusive designations. So physicalism as construed by Jaworski is compatible with mental (or chemical or biological) predicates truly applying to composite objects in our ontology, but only in virtue of those objects instantiating the basic properties of physics. This means that Jaworski’s definition of physicalism complies with his second requirement for such a definition (in addition to the requirement to comply with the core thesis), namely that the definition must be compatible with the different versions of physicalism: eliminativism, reductivism, and non-reductivism²⁹.

3.4 Jaworski illustrates the physicalist position using an imaginary character, the super physicist³⁰. The super physicist is said to possess complete knowledge of the fundamental physical materials but to lack the conceptual resources of the special sciences. From the super physicist’s standpoint, says Jaworski, there is just a continuous curtain of fundamental physical particles or stuff. And, Jaworski says:

“If physicalism is true ... the super physicist’s description misses out nothing. Since everything can be exhaustively described and explained by physics, the super physicist’s descriptions of the universe are complete as they stand. If you and I describe the universe in ways that recognise the distinctions between living things and nonliving ones, or mental beings and nonmental ones, that is a comment not necessarily about what the universe contains, but about how we go about describing it.”³¹

So on this view, all that exists are the basic particles characterised by the basic properties, behaving in accordance with the laws of physics. I will assume that these laws apply to the behaviour of the basic particles in the same way, whether the particles are relatively isolated or part of a complex arrangement of particles, such as an arrangement constituting an organism. I will also assume that the laws provide for physical causal closure. The principle of causal closure can be formulated in different ways but, for present purposes, it can be taken to be the principle that all physical

²⁸ Jaworski (2016), p. 224.

²⁹ See Jaworski (2016), p. 221.

³⁰ See Jaworski (2016), p. 10.

³¹ Jaworski (2016), p. 10.

effects have a sufficient physical cause³². Given these assumptions, the super physicist could follow the progress of an individual basic particle throughout its history, as it joined and left arrangements of particles of varying complexity, without needing to have recourse to anything other than the laws of physics to describe its behaviour. And, in theory, the super physicalist could follow the progress of every basic particle in this way. Note, however, that although Jaworski introduces the super physicist as both an explanatory and ontological monist there is no need for the super physicist to be so conceptually impoverished in order to represent the physicalist position (as is clear from Jaworski's second requirement for a definition of physicalism). The super physicist can describe the world using the conceptual resources of the special sciences. It's just that, in doing so, the super physicist does not accept any ontological commitments over and above those of physics. The super physicist is a property monist but not necessarily an explanatory monist (or, indeed, an object monist - see Section 5). The claim that everything can be exhaustively described by physics is an ontological claim. It does not imply that there are not additional conceptual schemes providing alternative ways of describing this physicalist reality. Thus the physicalist answer to question Q above is: insofar as there are additional conceptual schemes they are just different ways of describing the ontologically basic level described by physics.

Physicalist theories of the mind-body relation

3.5 If everything can be exhaustively described by physics then the issue for the physicalist seeking to account for the place of the mind within a physical world is whether psychology also has some descriptive legitimacy. The most that psychology can hope for is that it is a different but legitimate way of describing the ontological facts described by physics. I will not consider in any detail the different versions of physicalism or the well developed criticisms of them. And I will not consider eliminativism as a physicalist option. My concern in this Section will be to consider the two general strategies available to reductive and non-reductive physicalists when developing their mind-body theories, and the possible shortcomings in the physicalist theories that can be seen as motivating non-physicalist mind-body theories like Jaworski's.

³² On different formulations of the principle of causal closure and their implications for mind-body theories, see Lowe (2008), chapter 2.

The physicalists' first strategy: numerical identity

3.6 The first physicalist strategy is to posit a numerical identity between the properties denoted by psychological predicates and the properties denoted by the predicates of physics so that the two sets of predicates are just two different ways of referring to the same properties. The reductive physicalist of the type-type variety proposes identities of the $M = P$ variety, where M is a type of mental property and P a type of physical property. This is supposed to be analogous with examples like the identification of water with H_2O . But what are the physical properties that are meant to be numerically identical with our beliefs and desires, pains and pleasures? The initial reduction may identify our mental properties with high level neural properties, which in turn will be identified with molecular properties and so on down to the fundamental level of physics. Given the transitivity of identity, the result is that our mental properties will be identified with an extremely complex arrangement of a sub-set of the basic particles that compose us (perhaps the particles composing our nervous system) and their properties and relations. This arrangement can be considered in terms of Kim's concept of a micro-structural property, which Kim himself uses to try and effect reductions between properties at the same level³³. In the water and H_2O case we have two predicates characterising a molecule, '... is a water molecule' and '... is H_2O '. To explain how these two predicates designated the same property, so that $water = H_2O$, we say that the property of being a water molecule, designated by the first predicate, is identical with a micro-structural property identified by the second predicate consisting of the water molecule's proper parts and their properties and relations. The micro-structural property can be represented as $R(P_1(H_1), P_1(H_2), P_2(O_1))$, where H_1 and H_2 are the two hydrogen atoms, O_1 the oxygen atom, P_1 and P_2 properties characterising hydrogen and oxygen atoms, respectively, and R the bonding relation between the molecules. $Water = H_2O$ can then be analysed as the property of being water = the micro-structural property $R(P_1(H_1), P_1(H_2), P_2(O_1))$. Using this approach, the type-type physicalist can seek to identify, for example, my belief that it is raining, a mental property, with a presumably immensely complicated micro-structural property of me consisting of a sub-set of my basic particles standing in a network of relations with each other.

3.7 How are such reductions to be effected? The identity of $water = H_2O$ was presumably discovered because both the properties of being water and being H_2O were independently identifiable and could then be identified as one and the same

³³ See Kim (1998), pp. 83-84.

property in the same way as Hesperus was identified with Phosphorus. Identities of the $M = P$ variety will not be like this insofar as the micro-structural property that I am taking P to be is a gerrymandered property, where to be a gerrymandered property is to be a property that is only identifiable as the realiser of some other property³⁴. If P is a gerrymandered property it won't be the case that a natural scientist who has been studying P as part of a scientific project comes to identify it as exactly the same property as, for example, the belief that it is raining. Kim argues that mental properties are reducible to physical properties just insofar as mental properties can be interpreted as functional properties in terms of their causal role. For example, the property of having a belief would be interpreted in terms of the inputs that give rise to its instantiation and the behavioural outputs that characteristically flow from its instantiation. This interpretation then allows the functionalised mental property to be identified with its physical realiser, that is, the physical property that fits the causal role. Kim says: "That a property is functionalisable - that is, it can be defined in terms of its causal role - is necessary and sufficient for functional reducibility"³⁵. Type-type property identifications are usually taken to be blocked by the multiple realisation argument. If mental property M is realised by two physical realisers, P^* and P^{**} , then, so the multiple realisation argument goes, M cannot be identified with either P^* or P^{**} . There are, however, two ways that a physicalist pursuing the numerical identity strategy can respond to this argument. First, the reductivist could propose two property types, M^* and M^{**} , and the reductions $M^* = P^*$ and $M^{**} = P^{**}$. Secondly, the reductivist could follow Heil and Robb and propose token-token identifications rather than type-type identifications³⁶. The multiple realisation argument assumes that properties are universals, blocking the identification of M with either P^* or P^{**} . But if properties are treated as particulars or tropes, then each particular instantiation of M can be identified with a particular instantiation of P^* or P^{**} .

3.8 One motivation behind the numerical identity strategy may be to preserve the reality of mental properties. The physicalist ontology implies that all sparse properties are physical properties. So if mental properties are also to be sparse properties they must be numerically identical with physical properties. But even if one accepts that such identifications would result in the reality of mental properties there are problems with the numerical identity strategy. I am assuming that the mental has both

³⁴ Fodor refers to gerrymandered properties in this sense in Fodor (1997).

³⁵ Kim (2005), p. 165.

³⁶ See Heil and Robb (2003).

phenomenal and psychological aspects. An identity theorist has problems with both aspects. On the phenomenal side, if we rely on being able to functionalise mental properties to effect their reduction then, as Kim admits, the phenomenal aspects of the mental are physically irreducible and “Qualia, therefore, are the ‘mental residue’ that cannot be accommodated within the physical domain”³⁷. On the psychological side, mental properties like belief and desire (the propositional attitudes) have distinctive identity or attribution conditions that arguably block their identification with physical properties. Child argues against such identifications on the basis of the uncodifiability of the rational³⁸. Child argues that propositional attitudes form a rational web that is in principle uncodifiable whereas physical states form a causal web that is in principle codifiable. It is therefore not possible, Child argues, to make detailed correlations, let alone identifications, between propositional attitudes and physical phenomena. A similar type of argument against the identification of mental and physical properties can be made on externalist (twin earth) grounds. The contents of a mental property like a belief, and thus its identity conditions, is dependent on the believer’s social and environmental circumstances. A belief about water on earth, for example, will be about H₂O whereas a belief about water on twin earth, where the watery stuff is XYZ, will be about XYZ. If Jon has belief M about water on earth, and thus about H₂O, and M is identified with physical property P, then his physical replica on twin earth will also instantiate P but will not instantiate M because the replica does not have a belief about H₂O. So M cannot be identified with P.

The physicalists’ second strategy: explanatory relevance

3.9 The second physicalist strategy is to abandon the attempt to identify mental properties with sparse physical properties. One type of non-reductivist physicalist, for example, treats psychology as providing an abstract description of the world described by physics and the other natural sciences. Thus, faced with the multiple realisation argument, instead of seeking to preserve numerical identities between mental property M and its multiple physical realisers they treat the relation between M and its realisers as a relation between higher and lower order properties. As explained in Section 2, M is thus treated as a logical construction quantifying over its realisers. Realisation is treated as a relation between abstract, higher order, predicates and sparse physical

³⁷ Kim (2005), p. 170. I discuss how a physicalist may seek to respond to the hard problem of qualia in Section 6.

³⁸ See Child (1994), chapter 2. As Child acknowledges, the uncodifiability argument is a development of Davidson’s argument for the anomalism of the mental - see, for example, Davidson (1974).

properties. The purpose of predicate 'M' is to allow us to take a broader brush approach to distinctions than that taken by the physical sciences in order to satisfy our different explanatory interests. But because such non-reductive physicalists still posit an isomorphism between the predicates and properties of the physical sciences and those of psychology, with mental predicates defined as quantifying over physical states, they arguably face the same problems as the identity theorists in relation to psychological properties (arising from the uncodifiability of the rational and externalism). And they will also struggle to account for the phenomenal aspect of the mental.

3.10 What I will call the relaxed physicalists move away from positing any systematic correlations between the properties denoted by the predicates of physics and those of psychology. They propose a relaxed view of the relation between the mental and the physical that seeks at the same time to preserve the causal relevance of psychological properties and their use in causal explanations of actions. On this strategy, psychological causal explanations must in some way relate to the causal goings on at the basic physical level but the "physical story will have its own shape and its own sort of complexity, and there will be no systematic correlation at all between elements in the [psychological and physical] stories ..."³⁹. Relaxed physicalists move away from positing a realisation relation between the mental and the physical to a looser, supervenience relation. This type of account requires distinguishing between sparse, causally efficacious, properties and properties that although not sparse are nevertheless causally relevant. Psychological properties are treated as causally relevant properties even though they are not, on this view, causally efficacious properties insofar as they occur in explanations of why something happened and satisfy certain other conditions. In Child's account psychological properties are casually relevant insofar as they play a role in a model of causal explanation, figure in counterfactuals and are connected in regular ways to their object's underlying causal powers⁴⁰. Such properties are ascribed to a person on the basis of their behavioural patterns, which depend on the person's behavioural dispositions. These behavioural dispositions in turn will be associated in regular ways with their bodily movements, which are assumed to be determined by the person's physical composition, ultimately, their constituent basic particles and their properties and relations. This approach to psychological properties is compatible with the uncodifiability of the rational and with externalist concerns. We ascribe psychological properties to a person in order to make

³⁹ Child (1994), p. 113.

⁴⁰ See Child (1994), chapter 6.

the best sense of a person's behaviour and so the norms of rationality are incorporated into our ascriptive practices. And our ascriptive practices take into account not only a subject's behaviour but also the social and environmental context in which they act. This approach also explains why the psychological supervenes on the physical and why psychological properties are *casually* relevant. A difference in the psychological properties that we ascribed to a person would require a difference in their behaviour or their context and, in either case, this will require a physical difference. And, if the context is held fixed, the ascription of a particular psychological property will reflect a person's physical constitution and thus explain (albeit indirectly) why something, the person's action, occurred.

3.11 As Child acknowledges, similar accounts have been given by other writers, such as Jackson and Pettit⁴¹. Jackson and Pettit also argue that a property can be causally relevant even if it is not casually efficacious. On their analysis a property, P, can be causally relevant in relation to an event if P's instantiation ensures that the relevant causally efficacious properties in the causal process leading up to the event are instantiated, even if P itself is not a causally efficacious property in that process. In their opinion this explains the causal relevance of higher-order properties cited in special science explanations, such as psychological explanations citing psychological properties. Kim, a proponent of the numerical identity strategy, criticises Jackson and Pettit's account⁴². On Kim's view, any account of psychological causal explanation worth having must provide for a causal relation between the psychological property cited in the explanation and the action being explained. Jackson and Pettit do not provide such an account because on their account, says Kim, "the 'because' in 'Doreen winced because she felt a sharp pain in her elbow' cannot be read as invoking a causal relation between Doreen's pain and her wincing"⁴³. According to Kim, a plausible account of causal explanation must do justice to the "because" in such explanations and, for Kim, this requires the explanation to cite causally efficacious sparse properties. The same criticism could be applied to Child's account.

⁴¹ See Child (1994), p. 192. The reference to Jackson and Pettit is to Jackson and Pettit (1990).

⁴² See Kim (1998), pp. 72 et seq.

⁴³ Kim (1998), p. 75.

The motivation for a non-physicalist mind-body theory

3.12 Kim's criticism of the explanatory relevance approach to mental properties sums up the difference between the two physicalist strategies and their consequences for physicalist mind-body theories. The identity strategy can potentially provide a realist account of mental properties, where such properties are treated as sparse properties. Arguably, however, such an account cannot do justice to the distinctive nature of psychological properties and their role in psychological explanations of actions. The explanatory relevance strategy takes account of this distinctive nature and explanatory role but only at the cost of rendering psychological properties *merely* explanatory. And both strategies seem to struggle to account for the phenomenal aspects of the mind (a point that I will return to in Section 6). These deficiencies provide a motivation for attempting to develop a non-physicalist theory of the mind-body relation that combines the advantages of the physicalist theories without their disadvantages. Jaworski's theory can be seen as one such attempt. He purports to develop a theory that provides the ontological resources required to develop a realist account of the mental whilst, at the same time, taking full account of our explanatory practices and the distinctive nature of the propositional attitudes.

4. JAWORSKI'S HYLOMORPHISM

4.1 What distinguishes Jaworski from the physicalists is his move from explanatory pluralism to ontological pluralism. In this Section I describe how this move grounds Jaworski's hylomorphic worldview and enables him to provide a distinctive theory of the mind-body relation. In Section 5 I then consider whether this move is justified.

The hylomorphic worldview

4.2 Jaworski is a property pluralist. Above the basic level of physics the world instantiates higher level hylomorphic structures. Jaworski states that "Hylomorphism claims that structure (or organisation, form, arrangement, order, or configuration) is a basic ontological and explanatory principle. Some individuals, paradigmatically living things, consist of materials that are structured or organised in various ways."⁴⁴ Even a physicalist can accept the importance of structure, that what distinguishes a living thing from an inanimate object is how its constitutive basic particles are arranged. What is distinctive about Jaworski's hylomorphism is the ontological status of the structures

⁴⁴ Jaworski (2016), p. 8.

described by the special sciences. Jaworski is a realist about such structures, this is what it means to describe structure as a basic ontological as well as explanatory principle. So Jaworski's answer to question Q set out in Section 2 is: the conceptual schemes of the special sciences have ontological commitments over and above the ontological commitments of physics, namely their commitment to hylomorphic structures.

Realist and non-realist approaches to structure

4.3 Jaworski contrasts his realist approach to structure to the non-realist approaches to structure of the physicalists⁴⁵. One way that Jaworski illustrates this distinction is by using a squashing example⁴⁶. If a human being is put in a strong bag to ensure that nothing leaks out and squashed there will be a change in the properties and behaviour of the bagged physical materials before and after squashing. Before the squashing the bag includes a human being with the power to think, feel and act. After the squashing the bag includes mush that cannot do any of these things (although it retains some of its properties, such as its mass). Jaworski says that what has changed is the way the physical materials are structured and that the pre-squashing structure was responsible, in part at least, for their being a human being with the relevant powers. The physicalists can agree that structure is the decisive thing in such squashing examples. Where they disagree with Jaworski is on the ontological significance of the structure. For the physicalist, before the squashing the basic particles composing the victim have a physical structure, what I will call their microphysical structure. This structure consists of the types of relations that can obtain between the basic particles and that can be exhaustively described by physics. It is structure as so understood that forms the basis of the physicalist account of the difference between the pre-squashing and post-squashing properties and behaviour of the physical materials in the bag. For the physicalists this is all there is to structure and references in the special sciences to structures should not be taken to refer to anything ontologically distinct from microphysical structures. Jaworski describes this as a non-realist approach to structure.

4.4 On Jaworski's hylomorphic account there is more to structure than this. On the way into the bag in the squashing example there is a hylomorphically structured individual. The hylomorphic structures the individual instantiates are modally correlated

⁴⁵ See Jaworski (2016), p. 20.

⁴⁶ See Jaworski (2016), p.9.

with the microphysical structure of the basic particles but are nevertheless ontologically distinct (weakly modally distinct) from the microphysical structure. It is this distinct hylomorphic structure that explains the composition and powers of the human being on the way into the bag and it is the break down of this structure as a result of the squashing that explains why there is no longer a human being in the bag with the power to think, feel and act. This is Jaworski's realist approach to structure. According to Jaworski the descriptive powers of physics are insufficient to exhaustively describe the behaviour of composite substances, paradigmatically the behaviour of living things like us, even though physics can exhaustively describe the behaviour of our constitutive basic particles. To describe the behaviour of composite substances recourse must also be had to the descriptive resources of special sciences, like biology and psychology, with their references to structure. And Jaworski's ontological naturalism requires him to treat these references to structures with ontological seriousness. He thus claims that the structures posited by the special sciences are real properties of composite objects, ontologically distinct from the properties posited by physics. That the structures are properties follows from Jaworski's substance-property metaphysics. The structures must be either substances or properties and Jaworski says that their theoretical roles correspond to those of properties⁴⁷.

Causal pluralism as the basis of Jaworski's structural realism

4.5 If, as Jaworski claims, hylomorphic structures are higher level sparse properties they must comply with his metaphysical theory of properties⁴⁸. In particular, they will confer causal powers on their composite bearers distinct from the causal powers manifested at the basic level and described by physics. This raises the question of how these distinct higher level powers relate to the lower level basic powers. Whilst Jaworski claims that his hylomorphic structures are sparse higher level properties, he also wants his hylomorphic theory to be consistent with the laws of physics, including causal closure⁴⁹. Combining his distinct higher level hylomorphic structures with lower level causal closure requires him to take a position on the nature of causation.

4.6 An instance of causation can be regarded as a relation between events in the world, treated in the ontological framework as property instantiations. There are

⁴⁷ See Jaworski (2016), p. 94.

⁴⁸ As Jaworski acknowledges - see Jaworski (2016), p. 94.

⁴⁹ Thus he says that hylomorphists "are committed to the idea that higher-level behaviour never violates lower-level physical laws" - Jaworski (2016), p. 280.

different accounts of the nature of this relation, which tend to divide roughly into two kinds. There are accounts that understand the relation as a process involving the transfer of some sort of quantity, such as energy, from cause to effect, and accounts in terms of regularity or probability, where the cause makes the effect more likely. Counterfactual accounts, for example, are of the second kind. I will call the view that there is only one kind of causal relation in the world causal monism and the view that there is more than one kind of causal relation causal pluralism. A theorist could be a causal pluralist because, for example, they combined a process account with a regularity or probability account but, as will be seen below, this is not the only way of being a causal pluralism. In addition to this distinction, there are different views on the levels at which instances of causation occur, with the physicalists, on the view I am taking of physicalism, being property monists and holding that causal relations occurred only at the basic level of physics (level monism) and non-physicalists being property pluralists and holding that causal relations occur at more than one level (level pluralism).

4.7 Causal monism comes in different varieties. One variety of causal monism holds that the only kind of causal relation is that described by physics - narrow causal monism. This is the view of the physicalists⁵⁰. Adding the physicalist requirement for causal closure results in level monism⁵¹. Another variety of causal monism is wide causal monism. Fodor can be treated as a representative of this view. In Fodor (1990) Fodor assumes that singular causal statements need to be covered by causal laws: If event e1 causes event e2, then there are properties F and G, such that e1 instantiates F and e2 instantiates G and “F instantiations are sufficient for G instantiations” is a causal law. In such a case properties F and G are causally responsible properties. The laws of physics are strict causal laws, where satisfaction of the law’s antecedent is nomologically sufficient for the satisfaction of its consequent. The laws of the special sciences are hedged, *ceteris paribus* laws. The properties cited in special science laws are, according to Fodor, causally responsible even though the laws are hedged. What distinguishes the two types of law is that in the case of *ceteris paribus* laws there is always an implementing mechanism in virtue of which the satisfaction of the

⁵⁰ Physicalism is compatible with either a process or regularity or probability view of causation. Physicalism may seem to go naturally with a process view but Davidson, for example, can be viewed as a narrow causal monist because his regularity view requires strict causal laws.

⁵¹ Without causal closure narrow causal monism would be compatible with emergence and level pluralism, where the higher level emergent powers operate like the powers described by physics.

antecedent brings about the satisfaction of the consequent. Fodor's position is an example of a causal monist theory that combines (wide) causal monism with level pluralism, and level pluralism with lower level causal closure⁵².

4.8 Jaworski combines causal pluralism with level pluralism, and this is how he combines his higher level hylomorphic structures with lower level causal closure. He argues that the properties (hylomorphic structures) posited by the special sciences are causally efficacious but in a different way from the properties posited by physics. Like any causal pluralist, Jaworski holds that there is more than one kind of causal relation but he does not describe this in terms of a combination of process and regularity or probability accounts of causation. His causal pluralism is instead based on his understanding of the relation between explanation and causation. Jaworski says that "... explanations in general map onto causes, and different kinds of explanations map onto different kinds of causes"⁵³. Jaworski explains that the different kinds of explanations can be catalogued by reference to the logic of the why- and how-questions that illicit them⁵⁴. A why- or how- question is said to contain the logical form of its answer, which will determine the range of things that count as explanations, in particular, whether the explanations should be given using the conceptual resources of physics or one of the special sciences. And, says Jaworski, "knowing what kinds of things count as explanations can reveal in turn the kinds of explanatory factors and relations that exist in the world"⁵⁵. This can be seen as part of Jaworski's ontological naturalism. It is this naturalism that requires him to treat the references to structures in the special sciences with ontological seriousness. This, in turn, given his ontological assumptions, requires him to treat such structures as sparse properties. Jaworski is now adding that the explanations in the special sciences carry with them not only an

⁵² Kim challenges Fodor's account of the causal responsibility of special science properties - see Kim (1998), pp. 50-51. He accepts that special science laws of the form 'F instantiations are sufficient for G instantiations', where F and G are special science properties, may support counterfactuals. He questions, however, whether such special science laws are causal laws in their own right, laws of the form "F-events, in virtue of being instantiations of property F, *cause* G-events". The challenge is that figuring in a counterfactual supporting law is not sufficient to make a property causally efficacious. The question is what makes the counterfactual supporting law true - what is the truth maker. And the truth maker may be a microphysical property, such as the microphysical properties responsible for Fodor's implementing mechanisms. Kim would no doubt criticise Jaworski's causal pluralism in the same way. I take up this kind of challenge to Jaworski's causal pluralism in Section 5.

⁵³ Jaworski (2016), p. 292.

⁵⁴ See Jaworski (2016), pp. 201 et seq.

⁵⁵ Jaworski (2016), p. 201.

ontological commitment to distinct hylomorphic structures but also to different kinds of causation associated with these structures. And it is because the different levels of structures - biological, psychological, etc - are said to be causal in a different way from, and so not to compete with, the powers conferred by the basic properties of physics, that Jaworski claims to be able to reconcile his higher level sparse properties with lower level causal closure. From the super physicist's point of view, the hylomorphic structures do not make a difference to the way that the basic particles composing a structured whole behave.

4.9 Jaworski's move from explanatory pluralism to causal pluralism is controversial. In the rest of this part of this Section I will explain Jaworski's causal pluralism in more detail. In Section 5 I will then consider criticisms of Jaworski's causal pluralism, and the structural realism that he posits on the basis of it, and suggest a way of justifying his ontological position. To illustrate Jaworski's causal pluralism I will use the example of Jon raising his arm as he walks down a city street in order to catch a taxi. This gives rise to the question⁵⁶:

(1) Why did Jon raise his arm?

There will be a number of ways of interpreting this why-question depending on the context. The most natural interpretation is to understand it as asking for Jon's reason for raising his arm (in contrast, for example, to just carrying on down the street). The following explanation would, on this interpretation, fall within the permitted range of replies:

(2) Jon raised his arm because he desired to catch a taxi and believed that this action would achieve the desired result.

Arguably this can then be reformulated as:

⁵⁶ I am assuming that all parties to the current debate, physicalists and non-physicalists like Jaworski, accept that when someone asks this question they are calling for a causal explanation, that is, an explanation of why something happened. See Child (1994), chapter 3, for an argument that the explanation of the occurrence of an event must be causal and that an action explanation explains the occurrence of an event.

(3) Jon's raising his arm was caused by his desire to catch a taxi and his belief that his action would achieve this desired result⁵⁷.

Jaworski explains the reformulation on the basis that the psychological explanation given in (2) maps onto a particular kind of causal factor, so that the explanation can be reformulated as a causal sentence along the lines of (3) without loss of meaning⁵⁸. (2) asserts an explanatory relation between explanatory factors; the fact that Jon wanted to catch a taxi and believed that this could be achieved by raising his arm explains why he raised his arm. In accordance with Jaworski's causal pluralism, (3) reformulates this statement in terms of a causal relation between causal factors, a causal relation in the world. So it seems that for Jaworski an explanatory factor is a causal factor is a cause. A different why-question may have determined a different range of possible explanations. Thus a neurologist monitoring Jon's brain in order to map its functions may have asked why Jon raised his arm (in contrast to his foot) and receive the following explanation:

(4) Jon raised his arm because neural fibres NF fired.

This could then be reformulated as:

(5) Jon's raising his arm was caused by neural fibres NF firing⁵⁹.

(4) refers to a different kind of explanatory relation between different explanatory factors, using the conceptual resources of neurology not psychology. And the reformulation in (5) sets this out in terms of the different kinds of causal relation and causal factors operating at the neurological level and mapped onto by the neurological

⁵⁷ This type of reformulation is controversial. We saw in Section 3 that Kim thought that the possibility of such a reformulation was required to do justice to the "because" in causal explanations like statement (2). In an account like Jackson and Pettit's such a reformulation is only acceptable insofar as it can be interpreted as asserting a causal relation between the underlying causally efficacious properties, the instantiation of which are ensured by the instantiation of the psychological properties cited in (2).

⁵⁸ See Jaworwki (2011), p. 291 on this reformulation point.

⁵⁹ More accurately, the neurologist is asking why the bodily movement occurred and it is the bodily movement, as opposed to Jon's action, that is explained by the neural fibres firing. This distinction is relevant to Jaworski's account of mental causation discussed in Section 6.

explanation⁶⁰. Alternatively an explanation in terms of neural fibres NF firing could be elicited by what Jaworski calls a how-question of mechanism, which asks how a system is able to perform an activity, where the logical form of the question calls for an explanation in terms of the how the sub-systems or parts of the system contribute to the activity⁶¹.

4.10 Jaworski compares his approach to Aristotle's account of causation and explanation and the doctrine of four causes⁶². Different kinds of Aristotelian why-question may require an explanation in terms of four different kinds of explanatory factor, corresponding to different kinds of causation: (i) the structure of things - their forms; (ii) the materials that get structured - their matter; (iii) what is responsible for bringing about the structuring of the matter - the efficient cause; (iv) what the structuring is for - the end. Jaworski says that "Answers to these different questions highlight different types of explanatory factors or causes, and various senses of 'because' express the various ways that those causes contribute to explaining the occurrence or phenomenon in question"⁶³. Despite its classical pedigree, however, this move from explanation and explanatory factors to causation and causal factors or causes may still be questioned. Physicalists would presumably argue that when used to refer to instances of causation, regarded as a relation between events in the world, "cause" should be used in a narrower sense approximating to Aristotle's efficient cause. And that it is in this narrower sense that questions concerning the ontological status of mental properties and mental causation are to be understood.

Jaworski's hylomorphic theory of the mind-body relation

4.11 Jaworski uses his hylomorphic theory of structure to provide a theory of the mind-body relation. He expresses this with the slogan:

Structure minds: it provides us with resources for understanding the place of mental phenomena within the natural world⁶⁴.

⁶⁰ See Jaworski's Madeleine example in Jaworski (2016) at pp. 204-205 for a similar point.

⁶¹ See Jaworski (2016), p. 203.

⁶² See Jaworski (2016), p. 206.

⁶³ Jaworski (2016), p. 206.

⁶⁴ See Jaworski (2016), p. 18.

Jaworski distinguishes two types of structures, individual-making structure and activity-making structure, and uses these structures to explain how minded-creatures like us fit into a natural world of the kind modelled by the compositional ontological framework that I developed in Section 2⁶⁵. If we stay with the example of Jon and his arm raising, the question that Jaworski's hylomorphic mind-body theory needs to address is how Jon and his arm raising fit into this compositional ontology. The answer comes in two parts. The first part shows how Jon fits in and relies on individual-making structures. Individual-making structures make structured individuals what they are. They account for the unity and persistence of structured individuals, despite the constant influx and efflux of physical materials that compose them, and provide the ontological resources for Jaworski's principle of composition (discussed in Section 5). This unity and persistence is imposed on such materials by each structured individual. It is the power that Jon has, for example, to organise or configure human-wise (Jon-wise) the materials that compose him⁶⁶. Whilst Jon exercises his power to configure the materials that compose him human-wise he constitutes an ontologically distinct composite object existing over and above those materials. When he ceases to organise or configure the materials in this way he ceases to exist. The second part of Jaworski's answer shows how Jon's arm raising action fits in to the compositional ontology and relies on activity-making structures. Once Jon is on the ontological scene it is his activity-making structures that make activities, like his arm raising, what they are by coordinating the manifestations of the powers of his relevant proper parts. The materials that compose Jon will have powers by virtue of the properties they instantiate, whether as basic particles or as complex arrangements of such particles forming his functional parts, such as his brain, heart, muscles and sinews. For Jon to raise his arm some of his functional parts must manifest their powers arm-raising-wise. Jon manifests his power to impose an arm-raising structure on the way his functional parts manifest their powers, bringing this new arm-raising activity of Jon's into existence⁶⁷. In this way he coordinates the way his parts manifest their powers, unifying the diverse physiological events into a single act of arm-raising.

⁶⁵ See Jaworski (2016), chapters 6 and 8, for his account of individual-making structure and activity-making structure.

⁶⁶ Jaworski says that "Configuring materials and being composed of materials are co-foundational concepts on the hylomorphic view" - Jaworski (2016), p. 104.

⁶⁷ See Jaworski (2016), pp. 155 et seq.

4.12 One consequence of this view of activity composition is that the powers of a composite object like Jon are essentially embodied. Jon only has the power to raise his arm in virtue of his relevant functional parts having their powers. And what can be said of this arm raising action, says Jaworski, can equally be said of all of Jon's mental activities:

“If all our capacities are essentially embodied, hylomorphism implies that thinking, feeling, perceiving, intentionally acting, and other activities that philosophers typically categorise as mental or psychological are all structured manifestations of powers ... The coordinated manifestation of those powers composes my thoughts, feelings, perceptions, and actions.”⁶⁸.

One of the virtues that Jaworski claims for his mind-body theory is that it situates the mind-body relation within a broader metaphysical framework⁶⁹. Above the fundamental level of basic particles hylomorphic structure predominates. These structures are essentially embodied in the basic materials. As we have seen, Jon and his behaviour can be described in a number of different ways drawing on the conceptual resources of one or other of the special sciences. Each level of description will pick out just one of the many different kinds of structures that are in play at any one time. Jaworski says:

“Biological, psychological, social, chemical, and physical phenomena do not exist in separation from each other in real human behaviour; they together constitute a single zone of psychophysical activity. The mental-psychical dichotomy is at best a logical construction, one that abstracts from the way psychological, social, physical, and other phenomenal are incorporated into real human behaviour.”⁷⁰.

Similarly, Jaworski says that his account “... does not treat the mental-physical distinction as canonical, but simply as an artefact of our descriptive and explanatory interests”⁷¹. These references to the mental-psychical dichotomy being at best a logical construction or the mental-physical distinction being simply an artefact should not be understood as casting doubt on the realist interpretation of Jaworski's hylomorphic

⁶⁸ Jaworski (2016), p. 170.

⁶⁹ See Jaworski (2016), p. 7, where Jaworski implicitly claims this virtue for his theory.

⁷⁰ Jaworski (2011), p. 307.

⁷¹ Jaworski (2016), p.173.

structures. I take Jaworski's point to be that on a particular occasion when we direct our attention on 'a single zone of psychophysical activity' like Jon we choose to focus on different kinds of structures, calling for different kinds of explanations, depending on our different explanatory interests. In this way we pick out only one of the many different levels of structure that are relevant to the behaviour of this zone of psychophysical activity at any one time. There is no problem with this provided we do not assume that there is a radical ontological distinction between, for example, the mental and the physical. Ultimately all there is are basic particles and different hylomorphic structures or configurations of such particles. What is distinctive about, for example, how Jon structures the powers of his parts arm-raising-wise is not the ontological status of the higher level structures involved but that this way of structuring the powers of his parts is subject to a particular type of evaluation, namely, rational evaluation.

4.13 As suggested at the end of Section 3, Jaworski's hylomorphic theory of the mind-body relation can be seen as an attempt to develop a non-physicalist theory that combines the advantages of the different types of physicalist theory. Like the identity theory physicalists, Jaworski can claim to provide a realist view of the mental. In Jaworski's theory the truth makers for explanations citing mental properties are distinct, causally efficacious, higher level hylomorphic structures. Like the relaxed physicalists, Jaworski can claim that his theory avoids the commitment to any systematic (isomorphic) correlations between the mental and physical, supervenience being sufficient to keep the psychological and physical explanations in step. Also like the relaxed physicalist, Jaworski can claim that his theory is compatible with the uncodifiability of the rational and with externalist concerns. Jaworski's theory takes full account of the nature of our psychological explanatory practices. The psychological explanation of why Jon raised his arm, for example, shows how that action fits into Jon's overall pattern of rational behaviour. The norms of rationality are incorporated into our explanatory practices and the hylomorphic structures that we latch onto when we provide psychological explanations have a distinctive kind of causality that reflects such practices. Similarly, Jaworski's theory can explain the relevance of social and environmental context in psychological explanations. The explanation that Jon raised his arm because he wanted to catch a taxi and believed that this action would achieve the desired result is only explanatory in an environment where a taxi is within Jon's visual range, the social setting provides for taxis and taxi hailing and so on. If Jon had configured the manifestation of the powers of his parts arm-raising-wise in a different social setting then the explanation of Jon's action, and thus the causal factors and

relations mapped by that explanation, would have been different. Finally, like both the identity theory physicalists and the relaxed physicalists, Jaworski can claim that his theory is consistent with the causal closure of the physical world. Jaworski's attempt, however, to combine the realism of reductive physicalism with the sensitivity of relaxed physicalism to the distinctive nature of our psychological explanatory practices exposes his hylomorphic theory to criticism. His critics will say that Jaworski's realist credentials are based on a defect in his general ontological framework, which relies on an unjustified move from explanatory pluralism to ontological pluralism. Jaworski, they will say, hypostases the relaxed physicalist's causally relevant psychological properties. I consider this charge against Jaworski's ontological framework in the next Section.

5. AN ASSESSMENT OF JAWORSKI'S HYLOMORPHISM AS A GENERAL METAPHYSICAL THEORY

5.1 In this Section I carry out the first stage of the assessment of Jaworski's hylomorphism, considering the merits of the metaphysical framework within which he situates his theory of the mind-body relation. As discussed in the previous Section, the difference between Jaworski's hylomorphic worldview and that of his physicalist rivals centres on Jaworski's structural realism. Jaworski expresses this realism with the following slogans:

Structure matters: it operates as an irreducible ontological principle, one that accounts at least in part for what things essentially are.

Structure makes a difference: it operates as an irreducible explanatory principle, one that accounts at least in part for what things can do, the powers they have⁷².

Structure matters in that an individual is only the individual that it is because of its individual making structure and an activity is only the activity that it is, say throwing a ball, if the structured individual configures (structures) its parts and surrounding materials ball-throwing-wise. Structure makes a difference because structures are powers so that if an object has a structure it has powers that it would not otherwise have. At the same time Jaworski claims that this view of higher level hylomorphic structures is consistent with the laws of physics, including causal closure. Despite such

⁷² See Jaworski (2016), p. 3; discussed in relation to individual-making structure at pp. 97 et seq. and in relation to activity-making structure at pp. 159 et seq. These are two of the four slogans that Jaworski uses to set out the theoretical roles that he attributes to structure. I set out the third slogan (structure counts) later in this Section. The fourth (structure minds) is set out in Section 4.

structures the super physicist can describe the world at the fundamental level of basic particles with complete accuracy, tracing the movement of each basic particle as it interrelates with its fellow particles, without noticing the difference that structure makes. Jaworski's causal pluralism plays the central role in his theory of ensuring that his hylomorphic structures make a causal difference but without disturbing the movement of the basic particles. But by seeking to render his structural realism compatible with the physical world in this way Jaworski opens himself up to the charge that he is attempting to get his realism 'on the cheap', that he is offering what Kim calls a "free lunch" solution - a solution at minimal philosophical cost⁷³. In the first part of this Section I develop this charge by arguing that Jaworski is potentially enough of a realist to expose himself to a conceivability or zombie style argument but not enough of a realist to avoid epiphenomenalism. I close this part of the Section by considering Robinson's criticism that, in effect, Jaworski's causal pluralism is just explanatory pluralism with an unjustified ontological gloss⁷⁴. I conclude that none of these arguments against Jaworski's position are conclusive. Nevertheless they put pressure on Jaworski to justify his structural realism. In the second part of this Section I run an argument on Jaworski's behalf, drawing on his principle of composition, that attempts to provide such a justification.

Criticisms of Jaworski's structural realism

Zombie structures

5.2 The basic form of a conceivability or zombie style argument is as follows⁷⁵:

- (1) P and \sim Q is conceivable
- (2) If P and \sim Q is conceivable then P and \sim Q is metaphysically possible
- (3) If P and \sim Q is metaphysically possible, materialism is false

- (4) Materialism is false.

P is taken to be the conjunction of all microphysical truths and Q a phenomenal truth. The argument is directed at materialist claims that the phenomenal reduces to or

⁷³ See Kim (1998), p. 59.

⁷⁴ See Robinson (2014).

⁷⁵ See Chalmers (2010), chapter 6. I say more about conceivability arguments in Section 6 when considering the hard problem of consciousness.

otherwise supervenes upon the microphysical, the fundamental level of basic particles, with their basic properties and relations. But because Jaworski claims that his hylomorphic structures are properties that are ontologically distinct from but supervenient upon the microphysical he opens himself up to the same kind of argument, with Q now expressing a truth about hylomorphic structure and the conclusion being that his hylomorphism is false⁷⁶.

5.3 Jaworski claims, for example, that his hylomorphic theory of individual-making-structure is committed to the following strong metaphysical supervenience thesis:

Structo-physical supervenience: For any possible worlds w_1 and w_2 , and any physical materials, x_1, x_2, \dots, x_n in w_1 and y_1, y_2, \dots, y_n in w_2 , if the x s at time t are exactly similar to the y s at time t^* in respect of the kinds of properties and relations that can be exhaustively described and explained by physics, then the x s compose an individual at t if and only if the y s compose an individual at t^* that is structurally exactly similar to x at t ⁷⁷.

Assume that the x s in w_1 compose Jon. On Jaworski's account of individual-making structure this means that Jon is configuring the x s human-wise, that is, he is imposing individual-making structure on them. The structo-physical supervenience thesis rules out the y s in w_2 being arranged in exactly the same way as the x s and being in all respects the same in respect of the properties and relations that can be described exhaustively by physics and yet not composing a replica of Jon, so that Jon's replica, Jon*, is a structure zombie. Jaworski says that he regards the structure zombie scenario "as absurd, but I confess that I do not have an argument to show that [the scenario is] impossible. I can only hope to appeal to relevant intuitions"⁷⁸. But is the scenario absurd? After all, Jaworski is committed to such self-configuring activity, the instantiation of individual-making structure, being ontologically distinct from the underlying arrangement of basic particles and their properties. If the self-configuring activity is genuinely numerically distinct from the underlying arrangement why can't it be instantiated in w_1 but not w_2 , contrary to the structo-physical supervenience? Perhaps, for example, the y s in w_2 come together human-wise at time t^* due to a freak

⁷⁶ Jaworski expresses the close non-identity relation between his hylomorphic structures and the physical world in terms of a series of strong necessitation and supervenience relations - see Jaworski (2016), chapter 9.

⁷⁷ Jaworski (2016), p. 187.

⁷⁸ Jaworski (2016), p.188.

natural occurrence and then are immediately dispersed. It does not seem so absurd in this scenario to argue that whilst the x s compose Jon at time t because their arrangement is a stable arrangement resulting from Jon's self-configuring activity, the y s do not compose Jon* at t^* because there is no self-configuring activity going on in w_2 , just a chance, unstable, arrangement of the y s. This freak of nature scenario, however, may just reveal a problem with the way Jaworski formulates his structo-physical supervenience thesis, which is set out purely synchronically in terms of the covariation of the x s and their supervening individual-making structure at a particular time. Individual-making structure has a dynamic aspect as well as a synchronic aspect. It accounts for the unity and persistence of a structured individual over time. So perhaps the formulation of the thesis needs to provide for the physical history of the x s and y s to be the same at all times leading up to time t/t^* . After all, I presume that what Jaworski really finds absurd is the scenario where the y s in w_2 could have physical characteristics exactly similar to the x s in w_1 over time, and so appear to compose Jon* over time, with the same powers as Jon and seemingly engaging in activities exactly similar to Jon, but that nevertheless whilst the x s composed Jon, a structured individual, Jon* is a structure zombie.

5.4 Jaworski's vulnerability to the zombie argument arises because his hylomorphic structures are ontologically distinct from the physical properties on which they supervene. And the problem that he has when appealing to our intuitions is that his structures do not interfere with the behaviour of the world as described by physics. So if we invest our super physicist with creative powers it seems initially both conceivable and possible that it could create worlds w_1 and w_2 so that they ran according to the laws of physics and then forget to add the distinct hylomorphic structures or add them to w_1 but forget to add them to w_2 . From the super physicist's point of view such forgetfulness would not affect the behaviour of the worlds, which would still run in accordance with the laws of physics. Jaworski can give the standard argument to the zombie style argument. Given his structo-physical supervenience thesis, even if P and $\sim Q$ is conceivable (with Q being a structural truth) it is not metaphysically possible. Once the super-physicist has fixed the physical properties then no further creative activity is required to fix the hylomorphic structures. Nevertheless a concern remains that all that Jaworski has done is assert that the physical and structural properties modally co-vary without really explaining why this should be the case. Jaworski opens himself up to the zombie argument because of his move from explanatory pluralism to ontological pluralism. Reductive physicalists, who deny this move, are also vulnerable to zombie arguments, at least in relation to the co-variation of phenomenal mental

properties and physical properties (as I will discuss in Section 6). But if, as they claim, mental properties are numerically identical to physical properties they have a straightforward account of why once the physical properties have been fixed the mental properties are fixed. And relaxed physicalists also have a straightforward way of dealing with the argument. If two possible worlds are exactly similar in respect of the kinds of properties and relations that can be exhaustively described by physics, there could be no justification for different descriptions and explanations in the special sciences⁷⁹. In the above scenario Jon and Jon* will be described and explained in exactly the same way. To justify a different attribution of psychological properties to Jon*, for example, would require Jon* having different behavioural dispositions from Jon and thus, ultimately, a different physical constitution. Jaworski, however, with his move from explanatory to ontological pluralism, lacks such a straightforward explanation of the modal co-variation between his distinct hylomorphic structures and the underlying physical properties.

Epiphenomenalism

5.5 A related problem for Jaworski is explaining how his hylomorphic structures can make a difference by accounting in part for what things can do, the powers they have, if they do not interfere with the behaviour of the world as described by physics. This raises the concern that Jaworski's structures are epiphenomenal. Jaworski considers the charge of epiphenomenalism as part of his consideration of what he calls "Williams' worry", the worry that "hylomorphism emerges as just a polite form of materialism"⁸⁰. Jaworski sets out one form of this worry as follows:

"Hylomorphism claims that the behaviour of structured individuals like us never violates the laws governing their fundamental physical constituents... But if structured individuals can never violate fundamental physicals laws, then it seems it must be impossible for our thoughts and feelings to make any causal difference to our behaviour. ... Hylomorphism must be committed, therefore, to something like epiphenomenalism. Even if there are structures that elude

⁷⁹ This needs to be qualified because different explanatory interests may lead to different descriptions and explanations. But the point holds if one holds such interests fixed.

⁸⁰ See Jaworski (2016), pp. 213 et seq. for a list of forms Williams' worry could take. The quote is from Williams (1986), p. 224.

physical description, the things we do, our behaviour, can still be exhaustively explained by appeal to physics alone.”⁸¹.

Jaworski’s response relies on his causal pluralism. He says that the epiphenomenalism charge assumes that “in order to make a difference to things, higher-level causal relations must conform to the models of causation described by physics”⁸². But as we have seen, according to Jaworski even though, given his commitment to strong supervenience, the higher and lower level differences must be correlated these “correlations between higher- and lower- level differences ... do not depend on higher-level phenomena conforming to models of causation in physics”⁸³. When, for example, Jon raises his arm to catch the taxi he imposes activity-making structure on the manifestation of the power of his parts. But this imposition does not violate the laws governing his fundamental physical constituents - the basic particles⁸⁴. This would only be the case if the imposition of structure was a causal process of the same kind as causal processes at the fundamental level, a form of downward causation. It is this kind of response, however, which requires Jaworski’s hylomorphic structures to be higher level sparse properties and yet not to disturb the behaviour of the basic particles at the fundamental level, that gives rise to the concern that Jaworski wants to have his realism on the cheap.

Is explanatory pluralism enough to justify or constitute the real efficacy of the non-basic level?

5.6 The suspicion that Jaworski wants to have his realism on the cheap is the basis of Robinson’s criticism of Jaworski and his fellow modern hylomorphists⁸⁵. Robinson questions whether it is possible to combine a realist interpretation of hylomorphic structure with closure under physics, as modern hylomorphists like Jaworski seek to do. Robinson says that there are two ways of interpreting the reference to the structures that appear in the explanations of the special sciences. The realist interpretation of structure, adopted by hylomorphists like Jaworski, treats such

⁸¹ Jaworski (2016), p. 214. Jaworski labels this as ‘Worry 6’.

⁸² Jaworski (2016), p. 292.

⁸³ Jaworski (2016), p. 293.

⁸⁴ See Jaworski (2016), p. 161 “... given reasonable assumptions, activity composition implies that the behaviour of structured individuals never violates the laws governing their fundamental physical constituents”.

⁸⁵ Robinson (2014).

structures as sparse properties that enable their bearers to enter into causal relations. The conceptualist interpretation of structure denies the realist interpretation. For conceptualists, although structures figure in the explanations given by the special sciences this is just a different way of conceptualising the basic level of reality described by physics. There are no real, ontologically distinct, structures in the world corresponding to the structures given in special science explanations. The only real structures are what I have been calling microphysical structures. This is the physicalist position on structure. Robinson's argument is that it is only if one adopts the conceptualist interpretation that one's position will be consistent with the world being closed under physics. As we have seen, Jaworski relies on his causal pluralism to reconcile his structural realism with the world being closed under physics. Robinson claims, however:

“What one has, in fact, is an explanatory pluralism, with causation adopted into the domain of explanation; the wholly external, mind-free element is *force* and this is exclusively micro. So Jaworski is really only claiming that, once one realises that most explanations are causal explanations, explanatory pluralism is pluralism enough to constitute or ground a full causal realism about all levels. ...one may wonder whether *explanatory* pluralism is enough to justify or constitute the real efficacy of the non-basic level.”⁸⁶.

The alternative conceptualist interpretation is, as Robinson says: “... that, in so far as causation by complex structures belongs in the explanatory theories of the special sciences, it is not part of concrete reality, but of a certain mode of understanding it”⁸⁷.

5.7 Jaworski expressly replies to Robinson's criticism⁸⁸. His reply, however, is in many ways just a restatement of his position on structural realism. Jaworski argues that the structures referred to by the special sciences are not identical to, cannot be reduced to, the microphysical structures that can be exhaustively described by

⁸⁶ Robinson (2014), p. 4 (*italics in original*).

⁸⁷ Robinson (2014), p. 5.

⁸⁸ See Jaworski (2016), pp. 289 et seq.

physics⁸⁹. So physics cannot take over the explanatory role of the special sciences. But Robinson (and the physicalists) can go along with this part of Jaworski's argument, they can accept explanatory pluralism. Jaworski requires something more to rebut Robinson's challenge. Jaworski argues that the explanatory pluralism justifies hylomorphism's ontological pluralism:

“The idea that explanatory schemes of the special sciences do not express genuine causes but that the explanatory schemes of physics do, introduces an asymmetry in the general picture of how explanations are related to causes. If explanations map onto causes, and different kinds of explanations map onto different kinds of causes, then there is a unified account of the relation between causes and explanations. Robinson suggests something different: only some kinds of explanatory schemes map onto causes. But why? What justifies this claim? ...An answer would follow straightforwardly if the only causes that existed were forces - if, in other words, the causal pluralism that hylomorphists endorse were false. But then why should we accept this claim?”⁹⁰.

So Jaworski is accusing Robinson of begging the question against him. If one assumes that the only causes are the forces of physics then the special sciences do not describe causes of other sorts. At most there is just explanatory pluralism. But this is the very point at issue and cannot be assumed at the start of the argument. One might argue, however, that the way that I have set up the ontological framework within which this debate is taking place already establishes, as a starting point at least, an asymmetry in how explanations are related to causes. If we start off with the basic particles and their basic properties and arrange the particles in increasing levels of complexity, why should we think that this adds to the kind of causal relations in the world? Is the burden of proof not on causal pluralists like Jaworski?

⁸⁹ Jaworski addresses this point as part of his consideration of what he labels as 'Worry 1', the worry that biological structures are just complex relations amongst physical materials whose properties and relations can be exhaustively described by physics - see Jaworski (2016), p. 251. Jaworski says "... none of these properties or relations is the kind of dynamic higher-level structure that belongs to the subject matter of biology, psychology, or other special sciences".

⁹⁰ Jaworski (2016), p. 292.

Hylomorphic and physicalist principles of composition

5.8 The criticisms of Jaworski's position considered in the first part of this Section are intended to show that there is pressure on Jaworski to provide further justification for his structural realism and the causal pluralism on which it is based. In this part of this Section I run an argument on Jaworski's behalf that seeks to justify his structural realism on the basis that it provides a satisfactory solution to the composition problem, one not available to physicalists. As Heil says, an important yardstick of an ontology's merit lies in its application, its power to resolve philosophical problems in a natural way⁹¹. If Jaworski's hylomorphic ontology has the power to resolve the composition problem in a natural way this will provide some justification for his structural realism and ultimately for his mind-body theory based on this structural realism.

Van Inwagen and the special composition question

5.9 In Section 2 I introduced van Inwagen's special composition question: when is it true that for some object y, the xs compose the y? where 'the xs' is treated as a plural referring expression referring to two or more basic particles. Having rejected the extreme answers to this question, mereological nihilism and universalism, van Inwagen considers and rejects the following restricted composition answers: to get the xs to compose something one need only (1) bring them into contact; (2) cause them to be fastened to one another; (3) cause them to cohere; (4) cause them to fuse. I will not go into van Inwagen's reasons for rejecting these positions in any detail. But a flavour of his reasoning can be given by first looking at what he says in relation to contact. He asks "If I bring two cubes into contact so that a face of one is conterminous with a face of the other, have I thereby brought into existence a solid that is twice as long as it is wide? Or have I merely rearranged the furniture of the earth without addition to it?"⁹². Van Inwagen says that although in such a simple case there may appear to be no ontologically correct answer, as if it were a matter of convention which answer we adopted, in other cases it is clearer that mere contact is not sufficient to produce a new (composite) object, such as when two people shake hands. Similarly in relation to the other proposed answers. Thus cohesion produces a relatively stable relation; if the blocks were glued together they could not be pulled apart. But if the two handshakers' hands are covered in glue they do not thereby come to compose a composite object.

⁹¹ See Heil (2003), p. 14.

⁹² Van Inwagen (1990), p 35.

And so on. The rejection of these answers to the special composition question rules out some of the answers that could be given in purely physicalist terms.

5.10 Having rejected these forms of restricted composition, van Inwagen presents his own answer to the special composition question: there is some object y such that the xs compose y if and only if the activity of the xs constitute a life⁹³. Like the restricted composition answers that he rejects, van Inwagen says that this answer depends only on the spatial and causal relations that the basic particles, the xs, bear to one another. But in the rejected answers van Inwagen says that the causal relation of the xs is no more than a disposition to retain their relative spatial positions. In van Inwagen's answer the causal relation of the xs does more than this, it constitutes a life. The consequence of the sufficient part of van Inwagen's answer (the xs compose y if their activities constitute a life) is that in addition to, over and above, the xs and their activities there is a y, a living organism. The activities of the xs bring into existence a new object, a composite object, rather than merely rearranging the furniture of the earth without addition to it. The consequence of the necessary part of van Inwagen's answer (the xs compose y only if their activities constitute a life) is that the only composite objects are living organisms. There are no tables and chairs etc. Van Inwagen spends some time addressing the denial of the literal (as opposed to virtual) existence of such artefacts. For present purposes, however, I am concerned with the consequences of the sufficient part of the answer. Why should we take the activities of the xs to constitute an additional object, y, a composite object, over and above the xs? Why should we not say that more properly from an ontological point of view we should just talk of the collective activities of the xs, so that it is clear that the y is merely a virtual object like the tables and chairs?

5.11 Van Inwagen argues for his position in two ways. His broader type of argument focuses on the way the position deals with various philosophical problems concerning material objects, such as their identity and persistence through mereological change, as illustrated by the puzzle of the Ship of Theseus. These problems insofar as they relate to artefacts concern the necessary part of van Inwagen's answer (the nihilist part) and are not directly relevant for present purposes. The narrower type of argument

⁹³ See van Inwagen (1990), p. 82. Van Inwagen says that in the last analysis it is the business of biology to say what a life is - see p. 84. He suggests, however, that it can be regarded as a particular type of "unimaginably complex self-maintaining storm of atoms" - p. 87.

supports the sufficient part of van Inwagen's answer and is relevant⁹⁴. Van Inwagen's narrower argument has two parts. The first part addresses the Cartesian sounding question: why should I suppose that I exist? In this context the question asks why can't sentences about me, such as 'I exist' or 'I think', not be paraphrased into sentences that refer only to simples (basic particles), as is the case for artefacts⁹⁵? Van Inwagen answers this question by distinguishing between, on the one hand, the activities of an arrangement of simples that can be explained in terms of their joint collective activity rather than as the product of a single composite object and, on the other hand, activities that need to be explained in terms of a single composite object. The activities of an arrangement of simples arranged shelf-wise, for example, can be explained in terms of their collective activity, there is no need to posit a composite object, a shelf, over and above the arrangement of simples to explain how they support books (simples arranged book-wise). But, says van Inwagen "I do not see how we can regard thinking as a mere cooperative activity ... things can work together to think only in the sense that they can compose, in the strict and mereological understanding of the word, an object that thinks"⁹⁶. From this van Inwagen concludes, in Cartesian fashion, that he therefore exists. Therefore there is at least one case in which there is a composite material being with parts. The second part of the narrower argument says that this shows that a composite material being is actual and therefore possible but does not explain how it is possible. And, argues van Inwagen, the fact that I think does not have to be part of the explanation. Van Inwagen looks elsewhere for the explanation of how simples combine to compose composite objects. Van Inwagen concludes "It seems to me to be plausible to say that what binds them together is that their activities constitute a life, a homeodynamic storm of simples, a self-maintaining, well-individuated, jealous event."⁹⁷.

⁹⁴ Chapter 12 of van Inwagen (1990) draws this distinction between broader and narrower types of argument and contains van Inwagen's narrower arguments, of which he says "These arguments are perhaps rather weak, but I do not think them entirely worthless ..." (p. 115).

⁹⁵ As van Inwagen puts it in relation to thinking: "Why couldn't we introduce a variable polyadic predicate - say, 'the xs are arranged intellectually' - and paraphrase talk apparently about thinkers into talk that refers only to simples?" - van Inwagen (1990), p. 117.

⁹⁶ van Inwagen (1990), p. 118. This is similar to one of Kant's arguments in the Critique of Pure Reason for a fixed and abiding subject of consciousness. Kant says accompanying each representation of consciousness with a different subject would be like distributing the words of a verse between different beings, which would fail to make up a whole thought. See Kant (1781), A352.

⁹⁷ Van Inwagen (1990), p. 121. A jealous event is an event that cannot share its constituent particles.

5.12 Van Inwagen's argument relies on the distinction between what can be called collective properties and emergent properties. A collective property of an arrangement of basic particles is a property that can be understood in terms of the joint effect of the basic properties of the basic particles manifesting their powers in concert. In this case there is no need to posit a composite object as property bearer of a distinct higher level property; the property bearers are the individual basic particles. A property that cannot be understood in this way can be called an emergent property. O'Connor and Jacobs describe this distinction, using the terminology of structural and non-structural properties. They say that:

“A property is ‘non-structural’ [emergent in my terminology] if and only if its instantiation does not even partly consist in the instantiation of a plurality of more basic properties by the entity or its parts. There is nothing remotely like a ‘realisation’ relation holding between the emergent states and complex, lower-level physical states, whether conceived as tokens or types.”⁹⁸.

Kim also employs the structural/non-structural distinction, making use of the notion of a structural property when explaining the idea of micro-structural properties⁹⁹. Kim says: “Having a mass of ten kilograms is a property of certain aggregates of molecules, like my coffee table. And it is a micro-[structural] property of the table in the following sense: for my table to have this property is for it to consist of two parts, its top and its pedestal, such that the first has a mass of six kilograms and the second a mass of four kilograms.”¹⁰⁰. So, according to Kim, the table's property of having a mass of ten kilograms is the micro-structural property R(six kilograms (top), four kilograms (pedestal)), where R is the relation of being arranged table-wise. But, on the approach to properties and composition now being considered, there is no composite object, the table, instantiating the property of having ten kilograms, in addition to (over and above) the table's parts, its top and pedestal, and their properties. And the same analysis would apply all the way down to the fundamental level of basic particles. Van Inwagen expresses this idea in terms of two men, Tom and Tim, carrying a beam, saying: “... it is no argument for the thesis that Tom and Tim have a mereological sum to point out that they are carrying a beam: Tom's activity and Tim's activity are jointly sufficient to

⁹⁸ O'Connor and Jacobs (2003), p. 541.

⁹⁹ See Kim (1998), p. 84.

¹⁰⁰ Kim (1998), pp. 83-84. Kim refers to a ‘micro-based property’ but this is synonymous with ‘micro-structural property’, a term that Kim uses elsewhere.

account for the fact that the beam remains aloft ...”¹⁰¹. The same point is also made by van Inwagen’s bookshelf example referred to above. But, according to van Inwagen, an emergent property (activity) like life or thinking cannot be understood as consisting merely in the instantiation of a plurality of more basic properties by the living-thinking organism’s parts, as a mere cooperative activity in van Inwagen’s terminology. In the case of an emergent property there is a distinct property, over and above the properties of the organism’s parts, and a distinct bearer of that property. The bearers in the mass case are the parts of the table and ultimately the individual basic particles. The bearer in the living-thinking case, is, according to van Inwagen, a composite object, a living, thinking substance.

5.13 This approach to composition, with its reliance on the distinction between collective and emergent properties, has parallels with Merricks’ sparse approach to material objects, although Merricks’ argument for his position is different from van Inwagen’s¹⁰². Merricks uses what he calls ‘the Overdetermination Argument’ to argue that artefacts like baseballs do not exist in addition to basic particles arranged baseball-wise¹⁰³. This argument purports to show that a baseball, if it existed, would be causally irrelevant because anything that it was a candidate to have caused would be caused by its constituent particles acting in concert. Here ‘acting in concert’ plays the same theoretical role as the idea of the collective properties of an arrangement of basic particles. Thinking beings like us escape such elimination according to Merricks because we have causally non-redundant mental properties that allow us to cause things that our basic particles acting in concert do not cause¹⁰⁴. So mental properties in Merricks’ argument play the theoretical role that I am claiming for emergent properties.

5.14 On this approach to properties and composition, the suggested relation between an emergent property and the bearer of that property, what I will call an emergent object or bearer¹⁰⁵, is:

¹⁰¹ Van Inwagen (1990), p. 118.

¹⁰² See Merricks (2001).

¹⁰³ See Merricks (2001), chapter 3.

¹⁰⁴ See Merricks (2001), chapter 4.

¹⁰⁵ Note that the emergent object is a composite object composed of the basic particles not an emergent substance as in substance dualism. On this distinction, see O’Connor and Jacobs, p. 548.

(1) The instantiation of an emergent property is a necessary and sufficient condition for the existence of its emergent bearer.

This is van Inwagen's answer to his special composition question. For van Inwagen, the instantiation of the emergent property of life is a necessary and sufficient condition for the existence of a living organism, a composite object. This relation between emergent properties and emergent objects can also be expressed as follows:

(2) The existence of the emergent bearer is a necessary and sufficient condition for the instantiation of the emergent property.

The anti-physicalist nature of this approach to composition should be clear. If a collective property of an arrangement of basic particles is a property that can be understood in terms of the joint effect of the basic properties of the basic particles manifesting their powers in concert then it will be a property that can be exhaustively described by physics. This is why the physicalist Kim can be comfortable with his micro-structural properties. Such collective properties are entirely consistent with a physicalist's ontology. Conversely emergent properties will not be so describable and so will, as I am understanding physicalism, be inconsistent with a physicalist's ontology. And this will be the case even if the emergent properties supervene on the basic properties instantiated by basic particles in complex arrangements. On this approach to composition physicalists are faced with having to posit an austere ontology without emergent properties or emergent objects - an extreme form of eliminativism.

Jaworski and the special composition question

5.15 Jaworski says that the hylomorphic view of composition that he develops most closely resembles van Inwagen's view¹⁰⁶. Jaworski's answer to the special composition question is based on his theory of individual-making structure discussed above:

"composition occurs when and only when an individual configures materials: there is a y such that the xs compose a y if and only if y is an individual that configures the xs"¹⁰⁷.

Thus, as for van Inwagen, for Jaworski composition requires an emergent property (an

¹⁰⁶ See Jaworski (2016), p. 98. Robinson explains the motivation of modern hylomorphism as a response to van Inwagen's special composition question. Robinson says that this question prompted the thought amongst the modern hylomorphists that there may be a way of answering the question based on composite objects having the right kind of hylomorphic structure. See Robinson (2014), p. 2.

¹⁰⁷ Jaworski (2016), p. 104.

individual-making structure conferring the power to configure materials) resulting in an emergent composite object, a structured individual, as the bearer of that property. My power to impose individual-making structure, to be able to configure the materials that compose me human-wise, is not a property that can be understood as a collective property, that is, in terms of the joint effect of the basic properties of my constituent basic particles manifesting their powers in concert. Jaworski makes this point in relation to the imposition of structures, whether individual-making or activity-making, when he says:

“The structure that makes something a piano is not produced by pieces of wood and metal; it is instead something imposed on the wood and metal. Likewise, say hylomorphists, brains do not generate or produce thoughts, feelings or actions. The latter are instead coordinated manifestations of the powers of brains ...”¹⁰⁸.

So the power to impose individual-making structure is an emergent property. Jaworski says that like van Inwagen’s approach to composition: “The hylomorphic view is also committed to property pluralism. It implies that structured individuals have properties of at least two sorts: properties due to their individual-making structures ... and properties due to their materials alone, independent of the ways they are structured”¹⁰⁹. The properties of a structured individual that are due to their materials alone, independent of the ways they are hylomorphically structured, are collective properties. These are the result of the materials manifesting the powers that they would have outside of their hylomorphic structural environment and thus ultimately the powers that the materials have that fall within the remit of physics. The properties due to a structured individual’s individual-making structures are the emergent properties. Jaworski himself refers to such properties as emergent properties and says that: “... emergent properties are not aggregative properties such as mass. ... emergent properties are not possessed by any of an individual’s parts since the individual-making structure responsible for them is

¹⁰⁸ Jaworski (2016), p. 277.

¹⁰⁹ Jaworski (2016), p. 106.

not a feature of any one part considered in isolation; it is instead a feature of the whole those parts compose.”¹¹⁰.

5.16 There are differences between van Inwagen’s and Jaworski’s approach to composition. Van Inwagen does not espouse hylomorphism or causal pluralism. And Jaworski describes his ontology as less revisionary than van Inwagen’s¹¹¹. For van Inwagen the only proper parts of a living organism are its basic particles and cells whereas Jaworski accepts that there are also functional parts such as eyes, hearts and kidney’s. Jaworski’s reasons for admitting these organs into his ontology is his ontological naturalism; our biological descriptions and explanations posit such parts, which are thus part of its ontological commitments. For present purposes, however, the similarities between van Inwagen and Jaworski in relation to composition are more important. First, both their principles of composition rely on emergent properties and are thus not available to the physicalists. Secondly, both Jaworski and van Inwagen provide for the supervenience of the emergent properties on the properties of the emergent object’s parts¹¹². Thirdly, both their principles of composition provide a dynamic as well as a synchronic conception of composition. Jaworski’s individual-making structure accounts for what composite objects (individuals) essentially are at any particular time. This synchronic aspect of individual-making structure is reflected in the structo-physical supervenience thesis. And individual-making structure accounts for the unity of composite objects over time. Jaworski’s slogan for the dynamic aspect of individual-making structure is:

Structure counts: it explains the unity of composite things, including the persistence of one and the same living individual through the dynamic influx and efflux of matter and energy that characterise many of its interactions with the wider world¹¹³.

¹¹⁰ Jaworski (2016), p.107. Structured individuals could also have properties of a third sort if their constituent particles had latent powers that only manifested themselves when the particles were arranged together in certain complex ways. Such powers would fall outside of the remit of physics but their collective effect would be due to the particles acting in concert and there would be no need to explain it as the effect of an emergent property.

¹¹¹ See Jaworski (2016), p. 109.

¹¹² I discussed Jaworski’s structo-physical supervenience above. Van Inwagen says that he is strongly inclined to think that the properties of organisms supervene on the properties of their parts - see van Inwagen (1990), p. 90.

¹¹³ Jaworski (2016), p. 18.

As Jaworski says:

“An individual living thing does not configure exactly the same materials for very long since those materials are in constant flux, yet despite this, the individual maintains itself one and the same through all the changes on account of its ongoing configuring activity. That activity is what unifies various materials into a single individual, both synchronically and diachronically, just as lives do on van Inwagen’s account.”¹¹⁴.

It is the combination of the synchronic and diachronic aspects of structure that arguably provides the ontological resources for an attractive principle of composition, particularly the diachronic aspect. Jaworski’s approach to composition has the same anti-physicalist nature as van Inwagen’s approach to composition. There are, of course, other possible non-physicalist approaches to composition, like those of van Inwagen and Merricks discussed above. But for present purposes, if we focus just on the debate between Jaworski and the physicalists, we potentially have an argument that provides some justification for Jaworski’s structural realism and a basis for preferring Jaworski’s ontology to that of the physicalists.

The physicalists and the special composition question - a physicalist rejoinder

5.17 The assumption that Jaworski’s hylomorphism (or at least some form of non-physicalist ontology) is required to provide an acceptable principle of composition can, of course, be challenged by the physicalists. As explained in Section 3, the super physicist representative of physicalism does not have to be both an explanatory monist and an ontological monist. It can operate with the conceptual resources of the special sciences and join our conversations recognising the distinctions between living things and nonliving ones, or mental beings and non-mental ones. It’s just that, in doing so, the super physicist does not accept any ontological commitments over and above those of physics. In particular, It adopts Robinson’s conceptualist interpretation of the structures that figure in the explanations of the special sciences; they are just a different way of conceptualising the basic level of reality described by physics. And, as noted in Section 2, physicalists are not committed to object monism despite their commitment to property monism. A physicalist can adopt a position of restricted composition whereby: there is some object y such that the x s compose y if and only if

¹¹⁴ Jaworski (2016), pp. 105-106.

they satisfy condition C, where C can to be exhaustively described by physics¹¹⁵. To be acceptable as a principle of composition for minded creatures like us, however, and thus to provide an acceptable alternative to Jaworski's (or some other non-physicalist's) principle of composition, C would need to be able to explain our unity and persistence as composite objects throughout the dynamic influx and efflux of physical materials during our lifetimes. The issue for the physicalists is whether they can provide a principle of composition that is acceptable in this way whilst at the same time being consistent with their physicalist ontology.

5.18 Here is my attempt at a physicalist principle of composition that meets these requirements. Assume that the super physicist's conceptual resources include Fine's theory of rigid and variable embodiment¹¹⁶. Fine introduces the concept of rigid embodiment to deal with 'composite objects' that do not change their constituent parts, such as a water molecule that always possesses the same hydrogen and oxygen atoms¹¹⁷. Fine says:

“Given objects a, b, c, ... and given a relation R that may hold or fail to hold of those objects at any given time, we suppose that there is a new object - what one may call 'the objects a, b, c, ... in the relation R' ... An object of this special sort will be called a *rigid embodiment* ... The relation R will then be called the *principle of rigid embodiment* ...”¹¹⁸.

A water molecule is a rigid embodiment of the hydrogen and oxygen atoms suitably bonded. Fine also introduces the concept of variable embodiment to deal with composite objects that do change their parts. Fine gives as an example water in a river. Fine says:

¹¹⁵ See Jaworski (2016), p. 226.

¹¹⁶ See Fine (1999). Given that Fine describes his theory of embodiment as a version of hylomorphism (Fine (1999), p. 62) it might seem odd that I am attributing this theory to the super physicist, who is intended to represent the physicalist position. Fine's theory can, however, to use Koons' terminology, be characterised as a version of faint-hearted hylomorphism (see Koons (2014)) which, according to Koons, collapse into 'mere materialism' (Koons (2014), p. 2).

¹¹⁷ I have put 'composite objects' in scare quotes because many of the objects covered by Fine's concepts of embodiment will not be composite objects on more restricted accounts of composition, such as those of van Inwagen and Jaworski. Having made the point, however, I'll drop the scare quotes from now on.

¹¹⁸ Fine (1999), p. 65 - italics in original.

“In the case of the variable water [that is, the variable quantity of water that is in a river], there is a function or ‘principle’ that determines which quantity of water constitutes the variable water at any given time ... it picks out, at any time t at which the river exists, the quantity of water in the river at that time ... there is a new kind of whole corresponding to this principle, a whole that exists when and only when the principle picks out some water and that is constituted at any such time t by the quantity of water picked out by the principle at t In general, we will suppose, given any suitable function or principle F (taking times to things), that there is a corresponding object standing in the same relationship to F as the variable water of the river stands to *its* principle. We will call this object the *variable embodiment of F* and designate it by $/F/$.”¹¹⁹.

In order to give us an intuitive grip on the notion of variable embodiment Fine asks us to imagine a container into and out of which water flows. We thus have (a) the container, (b) the water that is in it at any given time, and (c) the container with the water in it. Now assume, says Fine, that the container somehow actively determines what water is in it at any one time and that it is not a physical object but conceptual in nature, so that the variable contents of the container are determined by conceptual rather than physical means. This, says Fine, provides “a pretty good model for our notion of variable embodiment, with the container being the principle of embodiment F and the container-cum-content being the variable embodiment $/F/$.”¹²⁰. Finally, Fine combines his two theories of embodiment. At each time at which a variable embodiment exists, that is, at each time at which the variable embodiment of F , $(/F/)$, exists, it is constituted by a rigid embodiment. F thus takes times to rigid embodiments: at time t_1 variable embodiment $/F/$ is composed of rigid embodiment₁, at t_2 , $/F/$ is composed of rigid embodiment₂, and so on.

5.19 When developing his theory of hylomorphic structure, Jaworski says:

“As we gaze out at the vast sea of matter and energy that is or will be described by our best physics, we see in it numerous localised pockets of organisation or order - semi-stable, self-maintaining warps or vortices of physical material.

¹¹⁹ Fine (1999), pp. 68-69 - italics in original.

¹²⁰ Fine (1999), p. 69.

According to hylomorphists, each of these vortices is a distinctive individual, paradigmatically an organism.”¹²¹.

He goes on to say that to understand these vortices or organisms we need to understand the physical materials that are caught up into them but that this in itself will not enable us to understand what sets the structured wholes apart as organisms, distinct from the inanimate materials that surround them. To understand this “there must be some further principle that accounts for the unity and also the persistence of structured wholes... According to hylomorphists ... [this] requires understanding their structures.”¹²². My suggestion on behalf of the physicalists is that, armed with Fine’s theory of rigid and variable embodiments, their representative, the super physicist, can converse with the hylomorphists as they gaze out together at the vast sea of matter and energy with its semi-stable, self-maintaining warps or vortices of physical material. Within this sea of matter and energy Jon raises his arm to catch a taxi. The super physicist can treat Jon as a variable embodiment. At each time at which Jon exists he will be constituted by a rigid embodiment, consisting of the basic particles that compose him standing in relation R ¹²³. Armed with its complete knowledge of the fundamental physical materials, the super physicist can work out function F , which will map the future rigid embodiments constituting Jon. This function F is Jon’s principle of embodiment and Jon is the variable embodiment $/F/$. All of this is consistent with the super physicist’s ontology. From the super physicist’s point of view there is nothing special about this particular variable embodiment but by employing function F in this way the super physicist is able to discuss Jon with the hylomorphists without making any ontological concessions. In this way the super physicist, representative of the physicalist position, is able to provide a physicalist principle of restricted composition. And this principle, employing the concept of variable embodiment, is a dynamic principle; it can account for the unity and persistence of variable objects like Jon despite the constant influx and efflux of materials that compose him. In this way the super physicist can seek to provide a physicalist principle of restricted composition that finds a place for composite objects like Jon within a physicalist ontology. It could then, for example, adopt relaxed physicalism to attribute psychological properties to Jon as part of its causal explanations of Jon’s behaviour.

¹²¹ Jaworski (2016), p. 93.

¹²² Jaworski (2016), p. 94.

¹²³ This is similar to the way in which the table in Kim’s example is treated as the bearer of the micro-structural property R (six kilograms (top), four kilograms (pedestal)).

5.20 If this attempt at a physicalist principle of composition works then it seems that, despite Fine's hylomorphic label, his theory of embodiment can be employed by the physicalists to provide a restricted principle of composition, with the structures referred to in the special sciences being, in Robinson's terminology, interpreted conceptually. Fine himself says that one of the consequences of his theory is that there will be a conceptual element to the identity of many material objects, with R, the principle of rigid embodiment, and F, the principle of variable embodiment, being conceptual in nature¹²⁴. I take this to mean that the arrangements of basic particles that are picked out by R and F are just different ways of conceptualising the basic level of reality described by physics, with some of the arrangements corresponding to our folk or scientific conceptions of material objects whilst others are purely gerrymandered objects. As Fine says, a consequence of his theory under its most plausible development is that there will be many more material objects than commonly supposed¹²⁵. Koons puts this point as follows: Fine's universe would be inhabited by "... a vast number of ontological monsters, many of which will share exactly the same material components at at least one point in time."¹²⁶. But is this really an acceptable principle of composition? Jaworski's hylomorphic structures reflect the ontological commitments of the special sciences, drawing on our best descriptions and explanations of reality. On Jaworski's account, there is a principled (rather than merely conventional) ontological distinction between Jon, a structured individual, and the inanimate materials that surround him or one of Fine's ontological monsters¹²⁷. Those who like to think that there is a principled distinction between living organisms and inanimate materials or the mereologists' gerrymandered ontological monsters may be inclined to favour Jaworski's principle of composition over those available to the physicalists, such as the one that I have suggested above on their behalf, and, at least on this basis, favour his hylomorphic worldview over theirs.

¹²⁴ See Fine (1999), p. 73. The physicalist employment of Fine's principles require this interpretation of Fine as a faint-hearted hylomorphist in Koons' classification - see above. Koons' says that Fine's theory could be interpreted as a stalwart version of hylomorphism, where structure is given a realist interpretation. See Koons (2014), p. 4. On the stalwart interpretation Fine's principles would be real substantial forms - sparse, causally efficacious, forms like Jaworski's structures. The physicalists could obviously not employ Fine's principles on a stalwart interpretation.

¹²⁵ See Fine (1999), p. 73.

¹²⁶ Koons (2014), p. 3.

¹²⁷ And the same can be said in relation to van Inwagen's and Merricks' accounts.

Does Jaworski succeed on composition where the physicalists fail?

5.21 My claim on Jaworski's behalf on the basis of his principle of composition should be understood as a conditional claim: if an acceptable principle of composition requires non-physicalist ontological resources, and if Jaworski's hylomorphic ontology supplies those resources, then this provides one way of justifying his hylomorphic worldview, with its structural realism. I do not claim to have discharged these conditions but only to have suggested arguments favouring Jaworski's hylomorphic principle of composition. To the extent that these arguments are successful it suggests that physicalists do not have the ontological resources to distinguish living organisms, such as human beings, from artefacts. As we have seen, van Inwagen can be regarded as a nihilist so far as artefacts are concerned. He offers paraphrases of everyday sentences about artefacts into sentences that refer only to simples. From the ontological point of view of the non-physicalists, the super physicist armed with the concepts of rigid and variable embodiment is like the nihilist in offering paraphrases of sentences about living, minded, creatures like us into sentences that refer only to simples. Van Inwagen's response to the nihilist's challenge in relation to the composition of minded creatures like us is that thinking cannot be treated as a mere cooperative activity in this way. Thought, for van Inwagen, is an emergent property requiring an emergent (composite) object as its bearer. This is why, on van Inwagen's approach, artefacts like computers cannot think: "They cannot think because they do not exist"¹²⁸. I am suggesting that Jaworski adopt the same line against the physicalists as van Inwagen adopts against the nihilist. There is (ontologically) more to living composite organisms like us than there is to artefacts like computers. And to explain this requires emergent hylomorphic structures.

5.22 For Jaworski's hylomorphic worldview to be able to draw support from the argument that an acceptable principle of composition requires non-physicalist ontological resources, however, it would need to be shown that his version of hylomorphism supplies those resources. And this returns us to the potential criticism of Jaworski's realist credentials referred to earlier: that his move from explanatory pluralism to ontological pluralism is unjustified and that he is trying to have his realism on the cheap. This criticism can be brought out by comparing Jaworski's emergentism with that proposed by O'Connor and Jacobs¹²⁹. O'Connor and Jacobs argue that a person's experiences and other conscious mental states are plausibly emergent (non-

¹²⁸ Van Inwagen (1990), p. 118.

¹²⁹ See O'Connor and Jacobs (2003).

structural) properties, and that such emergent properties cannot be instantiated by a person conceived of as merely the mereological sum of their parts, with these parts collectively instantiating the emergent properties. To instantiate such emergent properties, they say, we need to treat persons as composite wholes. So far there is nothing in O'Connor and Jacobs' account that Jaworski (or van Inwagen) would disagree with. Indeed Jaworski cites their paper when developing his principle of hylomorphic composition in support of the principle, which he shares, that any view committed to emergent properties must posit emergent individuals as well¹³⁰. There is, however, a significant difference between what O'Connor and Jacobs regard as emergent properties and van Inwagen's and Jaworski's treatment of emergent properties. O'Connor and Jacobs say that:

“Since the initial emergent states themselves will help to determine similar subsequent states ... the microphysics alone will not determine these later states. Likewise, emergent states will work in tandem with the underlying micro-states to determine later micro-states, manifesting a sort of ‘downwards’ causation. Hence the existence of emergent states is contrary to the assumption of much contemporary metaphysics and philosophy of mind, assumptions which typically include the truth of some fairly strong mental-physical supervenience thesis and the causal closure of the the microphysical realm. Neither of these assumptions will hold if there are emergent states as here defined.”¹³¹.

So the emergent properties that O'Connor and Jacobs have in mind are what one might call strong emergent properties (or more tendentially ‘real’ emergent properties). Properties that affect the microphysical goings on at the fundamental level. O'Connor and Jacobs criticise van Inwagen's view of emergent properties as properties of organisms that supervene upon the properties of their parts. If this is van Inwagen's view of emergent properties, O'Connor and Jacobs say, then they:

“... fail to see the force of [van Inwagen's] remarks against the thesis that thinking is a cooperative activity among non-thinking simples. If persons are objects that have no emergent mental features [in O'Connor and Jacobs' sense

¹³⁰ See Jaworski (2016), p. 104, footnote 6.

¹³¹ O'Connor and Jacobs (2003), p. 542. For the development of this type of emergentism see O'Connor and Wong (2005).

of emergent], then it seems that thinking must be a co-operative project between the simples that compose them.”¹³².

They go on to explain their theoretical goal as being to admit only those composites which do fundamental causal work¹³³. O'Connor and Jacobs use Leibniz's mill thought-experiment to compare composite objects with strong emergent properties, like us, with complex arrangements of simples that lack such properties and “are individual objects only by a courtesy born of practical concerns”¹³⁴. In the latter case, the Leibnizian shrunken observer (let's say a shrunken super physicist) walking around the merely complex arrangement of simples, let's say a computer, would be able to apprehend the local interactions of the basic particles “unconstrained in any fundamental way by non-derivative macroscopic forces ... The effect ... would be a quite reasonable dissolution of the sense of tight unity which unaided perception reinforces”¹³⁵. But, say O'Connor and Jacobs, on van Inwagen's view of emergent properties the effect would be the same when the shrunken observer walked around a living system. A shrunken observer walking around an emergent composite object with strong emergent properties, on the other hand, would notice a qualitative or dynamic difference between the two complexes, the computer and the living system. Strong emergent properties can thus be said to ground a genuine difference between living composite objects and non-living, stable arrangements of basic particles¹³⁶. So for O'Connor and Jacobs it is strong emergent properties that are necessary and sufficient for the existence of emergent objects.

¹³² O'Connor and Jacobs (2003), p. 554.

¹³³ This chimes with Merricks view on composite objects - see Merricks (2001), p. 60. Whilst Merricks rejects downward causation in relation to artefacts like baseballs, he accepts it in relation to us and our mental properties. This is why we are not causally redundant and so survive elimination by his Overdetermination Argument. His argument is: “that the existence of some objects with causally relevant properties (namely, objects with conscious mental properties) does not supervene on microphysical doings. Because of that ... we should say that some of what those objects cause, in virtue of having those properties, lack microphysical causes” - p. 110.

¹³⁴ O'Connor and Jacobs (2003), p. 547.

¹³⁵ O'Connor and Jacobs (2003), p. 547.

¹³⁶ Arguably basic particles with latent powers that only manifest themselves when the particles are arranged together in certain complex ways would be sufficient to explain the shrunken observer's different experience without having to rely on emergent powers. But the point remains that, if O'Connor and Jacobs are right, van Inwagen's and Jaworski's emergent properties are neither necessary nor sufficient for emergent objects.

5.23 So the question once again is whether Jaworski's causal pluralism and the structural realism that he develops on the back of that pluralism can do the theoretical work that Jaworski requires of it. Are his hylomorphic structural properties 'real enough' to enable him to answer the special composition question in a more acceptable way than the answers available from within a physicalist ontology? This is Robinson's concern, referred to above, as to "whether *explanatory* pluralism is enough to justify or constitute the real efficacy of the non-basic level". I take it that, other things being equal, it is an advantage to posit a theory of higher-level properties that is consistent with physics and causal closure. And it seems to me that it remains an open metaphysical question whether strong emergent properties are required for something that deserves the name of higher level property realism or for the purpose of providing an adequate principle of composition. All of the ontological theories on offer must pay a price for their ontological commitments. The physicalists make the least ontological commitments but, if my arguments in this part of this Section are successful, they do so at the cost of not being able to provide an acceptable principle of composition. Strong emergentists like O'Connor and Jacobs have the ontological resources to provide such a principle but they take on the largest empirical burden. They implicitly assume that there is only one kind of causation, the kind described by physics, so that the dispositional powers of emergent properties are supposed to operate like the forces described by physics. But their opponents say that there are good empirical grounds for denying that there are any such emergent forces resulting from emergent properties¹³⁷. Jaworski can be seen as attempting to steer a middle ground, with sufficient ontological commitments to enable him to provide an acceptable principle of composition, on the one hand, whilst avoiding the empirical burden of the strong emergentists, on the other hand. To the extent that he is successful this provides justification for endorsing his hylomorphic worldview.

6. AN ASSESSMENT OF JAWORSKI'S HYLOMORPHIC THEORY OF THE MIND-BODY RELATION

6.1 In Section 5 I carried out the first stage of my assessment of Jaworski's hylomorphism and his mind-body theory by considering the merits of his hylomorphic worldview. The second stage of my assessment requires considering the merits of

¹³⁷ For a response to this point see O'Connor and Wong (2005), pp. 673-674. Whereas the postulation of emergent chemical or biological properties may be particularly vulnerable to empirical refutation, O'Connor and Wong argue that matters are different with respect to psychological properties, where there is positive evidence favouring their strong emergent properties.

Jaworski's hylomorphic theory of the mind-body relation and, in particular, whether it does a better job of solving the mind-body problems relating to mental causation and the hard problem of consciousness than rival physicalist theories. At the end of Section 3 I suggested that Jaworski's hylomorphic theory of the mind-body relation could be seen as an attempt to develop a non-physicalist theory of the mind-body relation that combined the advantages of the different types of physicalist theory whilst avoiding their disadvantages. And in Section 4 I argued that Jaworski succeeded in that attempt insofar as his theory could be seen as providing, on the one hand, a realist view of mental phenomena, with the truth makers for explanations citing mental properties being distinct, causally efficacious, higher level hylomorphic structures, whilst, on the other hand, taking full account of the nature of our psychological explanatory practices. So, on the merits, there are reasons to prefer Jaworski's mind-body theory over the theories of his physicalist rivals. I concluded Section 4, however, by claiming that the success of Jaworski's theory depended on him being able to justify what I called his realist credentials. And in Section 5 I considered whether such justification was available.

6.2 In this Section I concentrate on how Jaworski and his physicalist rivals purport to solve the mind-body problems relating to mental causation and the hard problem of consciousness. The problem of mental causation relates to the psychological or public conception of the mental, the concept of the mind as the causal or explanatory basis of behaviour. The hard problem of consciousness relates to the phenomenal or private conception of the mental, the subjective, qualitative aspect of the mind. A complete theory of the mind-body relation needs to be able to solve the problems relating to both of these aspects of the mental. If Jaworski's theory of the mind-body relation has the power to resolve these problems in a natural way this will provide justification for both his mind-body theory and the hylomorphic ontology on which that theory is based. Consideration of how Jaworski and the physicalists deal with the problems of mental causation and the hard problem of consciousness completes the second stage of my assessment of Jaworski's hylomorphism and his mind-body theory. In the final part of this Section I consider, on the basis of this assessment, whether Jaworski has succeeded in showing that his hylomorphic theory of the mind-body relation should be taken seriously - at least as seriously as more familiar physicalist alternatives.

Mental causation

6.3 Mental causation is at the core of theories of the mind-body relation. Explaining how the mind and the body could causally interact is in large part explaining how they are related. And given the Eleatic Principle and the sparse view of properties that I have adopted, the existence of the mind depends on the possibility of mental causation. I am assuming that both physicalists and non-physicalists like Jaworski accept that psychological explanations of behaviour, like explaining why Jon raised his arm in terms of his beliefs and desires, are causal explanations. In parallel with such psychological explanations, however, there are also physical explanations of bodily movements such as Jon's arm rising, based on a chain of physical events running from Jon's motor cortex through to his arm muscles, and ultimately on a chain of events at the fundamental level of physics. Explaining how these two types of explanation and the properties that they cite are related gives rise to the problem of mental causation.

6.4 One version of the problem of mental causation problem, the exclusion problem, can be formulated in terms of the following jointly inconsistent claims:

- (1) Actions have mental causes
- (2) Actions have physical causes
- (3) The mental and physical causes of actions are distinct
- (4) If actions have multiple causes, then they are overdetermined
- (5) Actions are not overdetermined

Jaworski's discussion of the problem of mental causation concentrates on the exclusion problem and the above formulation of the problem is his¹³⁸. My consideration of mental causation will focus on the exclusion problem, using Jaworski's formulation.

6.5 Kim uses the exclusion problem to support reductive physicalism¹³⁹. He says that given that most of us will not want to give up on mental causation, claim (1) above, the "issue is *how to make our metaphysics consistent with mental causation*, and the choice that we need to make is between various *metaphysical alternatives*"¹⁴⁰. Kim chooses to deny claim (3). According to the substance-attribute ontology that I have

¹³⁸ See Jaworski (2016), p. 275.

¹³⁹ See, for example, Kim (1998), chapters 2 and 4 and Kim (2005), chapters 1 and 2.

¹⁴⁰ Kim (1998), p. 62. Italics in original.

adopted, causes are events and events are property instantiations. Two events are numerically identical if they consist of the same individual (basic particle or composite object) instantiating the same property at the same time. So event identity requires property identity. If mental and physical properties are distinct then mental and physical events and thus mental and physical causes are distinct¹⁴¹. So when Kim denies claim (3) he is denying that mental and physical properties are weakly or strongly modally distinct. This is the metaphysical alternative that Kim chooses - reductive physicalism. The question for present purposes is whether Kim's way of reconciling the five claims in the above formulation of the exclusion problem provides a basis for endorsing his theory of the mind-body relation (and thus, also, his reductive physicalist worldview). Kim claims that the "... exclusion argument shows that property dualism is not able to explain how mental causation is possible; instead of saving mental causation, it ends up relegating mental phenomena to the status of epiphenomena."¹⁴² For Kim, property dualism includes any position where mental properties are strongly or weakly modally distinct from physical properties, and thus equates with what I am calling property pluralism. If Kim is right this constitutes a decisive blow against property pluralists and their mind-body theories. Unfortunately for Kim, his property pluralist rivals, including Jaworski, have their own ways of solving the exclusion problem, so that the problem does not provide a way of choosing between the various competing worldviews and mind-body theories.

6.6 Starting with Kim's rivals in the physicalist camp, token-token identity theorists can follow Kim in rejecting claim (3). For functionalists who treat mental properties as higher order properties (higher order predicates) and relaxed physicalists who do not treat mental properties as sparse properties the potential competition between mental and physical properties on which the exclusion argument relies does not arise¹⁴³. There are other mind-body theories that Kim would regard as non-reductive physicalist positions but which are not treated as physicalist positions under Jaworski's interpretation of physicalism. These are non-reductive physicalists who are also

¹⁴¹ This relation between properties, events and causes is explained by Jaworski at (2016), p. 275.

¹⁴² Kim (2005), p. 158.

¹⁴³ Davidson's anomalous monism (see, for example, Davidson (1970)) also avoids the potential for competition between mental and physical properties. Davidson is a nominalist so far as properties are concerned. For him an event is mental if it can be described using mental predicates and physical if it can be described using physical predicates. The mental-physical distinction is a distinction between predicates rather than properties. So Davidson could deny claim (3). There are just events, which can be described using mental and physical predicates but act as causes simply as events.

property pluralists because they hold that mental properties are weakly modally distinct from physical properties. Kim claims that the exclusion argument shows that these non-reductive physicalist positions are unable to explain how mental causation is possible. But proponents of these positions deny this. For example, Bennett defends non-reductive physicalists who posit weakly modally distinct mental properties against the exclusion problem by denying claim (4), the overdetermination claim¹⁴⁴. Fodor would also presumably say that overdetermination is not a problem if one of the supposedly competing causes is the implementing mechanism for the other.

6.7 Predictably Jaworski relies on his causal pluralism to deal with the argument. He claims that the "... distinction among kinds of causal relations enables hylomorphists to solve the problem of mental causation in an attractive way."¹⁴⁵. Jaworski's causal pluralism allows him to rewrite claims (1) to (3) of the exclusion argument as follows:

- (1') Actions are rationalised by thoughts, feelings and/or perceptions
- (2') Muscular contractions are triggered by events in the nervous system.
- (3') Rationalising causes and physiological triggers are distinct.

Like Bennett and Fodor, Jaworski then rejects claim (4). Overdetermination for the purposes of the exclusion argument requires two or more causes of the same kind, as when two members of a firing squad both shoot the person being executed, with each shot arriving at the same time and being sufficient to kill the person. Rationalising causes and physiological triggers are different kinds of causes and are thus non-competing causes. With this re-interpretation, the claims of the exclusion argument are rendered unproblematically consistent. Jaworski acknowledges that his kind of solution to the exclusion problem, which relies on positing non-competing causes for actions, is not new¹⁴⁶. It is, as he says, a species of the dual explanandum strategy. Rationalising and triggering explanations address two different explananda: actions and physiological mechanisms, respectively. But Jaworski claims that his use of this strategy has the virtue of setting it within an overall metaphysics which makes it clear how such explanations and their corresponding causes fit together. The physiological mechanisms involved when Jon raises his arm, for example, are distinct from Jon's

¹⁴⁴ See Bennett (2003).

¹⁴⁵ Jaworski (2016), p. 281.

¹⁴⁶ See Jaworski (2016), pp. 282 et seq.

action of raising his arm. The physiological mechanisms could be triggered without the arm raising, for example, if the triggering occurred due to a spasm or as a result of outside interference by the super physicist. The manifestations of the powers of the physiological mechanisms only composes the action of Jon raising his arm if Jon coordinates the manifestations arm-raising wise by imposing activity-making structure on them. Jon's imposition of structure is one kind of cause on Jaworski's account explaining and causing the action, and the triggering of the physiological mechanisms is another kind of cause explaining the arm movement. Two distinct explanandum with two distinct explanations and causes.

6.8 In this way Jaworski's hylomorphic theory of the mind-body relation does allow him to provide an attractive solution to the exclusion problem. If, however, as I have suggested above, his physicalist rivals can also solve the exclusion problem in a satisfactory way then the problem of mental causation, as set out in the exclusion argument, does not provide a way of choosing between Jaworski's theory and those of his physicalist rivals. Jaworski suggests that he can at least use the exclusion argument to knock out his non-physicalist emergentist rivals. He claims that "emergentists have difficulty solving the problem of mental causation in a satisfactory way"¹⁴⁷. So one strategy for Jaworski would be to try and use the exclusion argument to knock out the emergentists, his main non-physicalists rivals, and then to use other arguments to try and knock out his physicalist rivals. Strong emergentists, like O'Connor and Jacobs referred to above, however, have their own answer to the exclusion argument. On their account an action can be partly caused by mental causes and partly by physical causes without overdetermination in the same way as the joint effect of jointly sufficient different physical causes does not lead to overdetermination. This allows them to reject claim (4) of the exclusion problem. They can put forward this solution because they do not accept causal closure. Not accepting causal closure may be problematic but to question this part of the strong emergentist's theory is to challenge their theory directly rather than via the exclusion argument.

The hard problem of consciousness

6.9 Chalmers says that "The hard problem of consciousness ... is that of explaining how and why physical processes give rise to phenomenal consciousness?"¹⁴⁸. The hard problem is said to contrast with the easy problem of consciousness, where the

¹⁴⁷ See Jaworski (2016), pp. 274-276 for his argument; the quote is at p. 276.

¹⁴⁸ Chalmers (2010), p. 105.

explanandum can be given a functional explanation¹⁴⁹. It is a conceptual fact, says Chalmers, that the psychological aspects of the mental are functionally definable. And once a mental phenomenon has been functionalised it is then just a question of identifying the computational or neural mechanisms that carry out the function. This accords with Kim's approach to functional reduction discussed above. But, says Chalmers, this sort of functional or reductive explanation fails for consciousness. Even when we have explained all of the associated functions a further question remains: why is the performance of these functions accompanied by experience? Take pain as an example. Pain has both psychological and phenomenal-qualitative aspects. It is the sort of state that tends to be produced by bodily damage and result in pain behaviour - its psychological aspect. But there is also the particularly unpleasant feel of pain, of what it is like to be in pain - its qualitative aspect. Chalmers' claim is that whilst we can in principle provide a reductive explanation of the psychological aspect of pain in terms of the mechanisms that link its inputs and behavioural outputs, this explanatory method is incapable of explaining pain's qualitative aspect.

6.10 The hard problem challenges those physicalists who claim to be able to provide a complete account of the mental. The very nature of physicalism seems to prevent physicalists from providing anything other than functional accounts of mental phenomena. But the hard problem is also a problem for Jaworski's mind-body theory. As we have seen, on Jaworski's account "thinking, feeling, perceiving, intentionally acting, and other activities that philosophers typically categorise as mental or psychological are all structured manifestations of powers"¹⁵⁰. When I throw a baseball I "coordinate the activities of my muscles, nerves and things in the environment ... I cause all of these things to manifest their powers in the way it takes for me to throw a baseball"¹⁵¹. Similarly, on this account, when I stub my toe I presumably cause my neurones, muscles, nerves and so on to manifest their powers in the way it takes for me to be in pain. But this gives rise to the hard problem. It is easy to see why the coordinated manifestation of these powers constitutes the psychological aspect of pain but why should such coordination be accompanied by the feeling of pain? On Jaworski's account the coordination must be so accompanied because feeling pain just is a structured manifestation of powers. But this sounds just like the physicalist who identifies phenomenal states with certain functional states. And like the physicalist who

¹⁴⁹ For Chalmers discussion of the hard and easy problems see Chalmers (2010), chapter 1.

¹⁵⁰ Jaworski (2016), p. 170.

¹⁵¹ Jaworski (2016), p. 158.

claims to be able to give a physicalist account of the phenomenal, Jaworski's mind-body theory implies various supervenience theses that mean that if two possible worlds, w_1 and w_2 , are exactly similar in respect of the kinds of properties and relations that can be exhaustively described by physics, then they are necessarily identical in terms of their phenomenal properties. For Jaworski, Jon in w_1 and his physical replica, Jon* in w_2 , will have the same parts¹⁵² with the same powers¹⁵³, and if Jon coordinates the powers of his parts pain-wise then so does Jon*¹⁵⁴. This commonality between Jaworski and the physicalists make them similarly vulnerable to Chalmers' refined version of the conceivability argument, discussed below, a common vulnerability that Jaworski acknowledges¹⁵⁵. In what follows I first look at Chalmers' refined conceivability argument. I then consider Jaworski's response to the argument. I claim that, even if Jaworski's response is successful, it is not a specifically hylomorphic response; his physicalist rivals can run a similar response. And, in any case, it still leaves the hard problem of explaining why physical activities or the coordination of such activities should be accompanied by feelings. I then consider ways in which Jaworski and the physicalists might seek to offer such an explanation, drawing on Chalmers' reference in the conceivability argument to Russellian monism.

Chalmers' refined conceivability argument

6.11 Chalmers' refined conceivability argument runs as follows¹⁵⁶:

- (1) P and $\sim Q$ is 1-conceivable.
- (2) If P and $\sim Q$ is 1-conceivable, then P and $\sim Q$ is 1-possible.
- (3) If P and $\sim Q$ is 1-possible, then P and $\sim Q$ is 2-possible or Russellian monism is true.
- (4) If P and $\sim Q$ is 2-possible, materialism is false.

¹⁵² This follows from the structo-physical supervenience thesis discussed in Section 5.

¹⁵³ This follows from the hylomorphic power supervenience thesis - see Jaworski (2016), p. 183.

¹⁵⁴ This follows from the hylomorphic activity supervenience thesis - see Jaworski (2016), p. 183.

¹⁵⁵ Jaworski acknowledges that Chalmers' conceivability argument applies to hylomorphism at p. 257.

¹⁵⁶ The argument is set out in Chalmers (2010), chapter 6, and discussed by Jaworski in Jaworski (2016) at pp. 257 et seq.

(5) Materialism is false or Russellian monism is true.

Here materialism covers all accounts that make the mental supervenient on the physical and so includes Jaworski's hylomorphism as well as physicalism. P is the conjunction of all microphysical truths about the universe. Q is a truth about phenomenal consciousness, which I will take to be a truth about the instantiation of the phenomenal aspect of pain.

6.12 The argument relies on the two dimensional approach to semantics. On this approach terms have both primary and secondary intensions. An intension is a function that takes possible worlds as arguments and gives extensions as values. Take 'water' as an example. We fix the referent (the extension) of 'water' using the characteristics that we associate with water - its being the clear, colourless, odourless, drinkable liquid that fills rivers etc. We fix the primary intension of 'water' by reference to centred worlds. We take a possible world as a centred world, Cw. We then ask what reference is fixed when a speaker in Cw refers to water in Cw. If the centred world is the actual world, then 'water' refers to H₂O. If the centred world is another possible world, where the clear, colourless, etc. liquid is XYZ, then 'water' refers to XYZ. So the primary intension of 'water' takes centred worlds as arguments and gives extensions as values, H₂O in the one case, and XYZ in the other. We fix the secondary extension of 'water' by treating the speaker's world as actual and all other possible worlds as counterfactual worlds. So if our world is treated as the actual world, the primary intension of 'water' is H₂O in our world and H₂O is the secondary intension in all possible worlds. The secondary intension of 'water' thus gives the same extension as the value, H₂O, for any possible world taken as argument. This two dimensional semantics can be used to set out different senses of 'conceivable' and 'possible'. The sense in which 'water is not H₂O' is conceivable and possible relies on the kind of conceivability and possibility corresponding to primary intensions: 1-conceivability and 1-possibility. We can 1-conceive that water is not H₂O because we can conceive of situations in which the primary intension of 'water' fixes a reference other than H₂O. It is thus 1-possible that water is not H₂O. But we cannot 2-conceive that water is not H₂O because the secondary intension fixes the reference of 'water' as H₂O in all counterfactual worlds, where our world is taken as actual. It is not 2-possible that water is not H₂O. So the 1-conceivability that water is not H₂O results in its 1-possibility but not its 2-possibility. This may seem to bode badly for Chalmers' refined conceivability argument, which needs to go from 1-conceivability to 1-possibility to 2-possibility. Chalmers argues,

however, that, given certain assumptions, this move is possible in relation to P and \sim Q and that this justifies the conclusion of his argument.

6.13 Chalmers relies on 1-conceivability in Premise (1). Premise (1) says that we can conceive of a world, w_2 , in which the primary intension of P are the microphysical properties instantiated in that world, MPw_2 , and the primary intension of Q is the phenomenal property of pain instantiated in that world, Qw_2 , and MPw_2 is instantiated but Qw_2 is not instantiated, so that P and \sim Q is 1-conceivable. And if it is 1-conceivable then it is 1-possible - Premise 2. But the 1-conceivability, and thus 1-possibility, of P and \sim Q does not on its own threaten the materialist. The materialist claims that there is no possible world in which P and \sim Q, where P and \sim Q have the same extensions as in our world. That is, the materialist's claim is that there is a necessary co-variation between the microphysical properties in our world and the phenomenal properties in our world; there is no possible world in which those microphysical properties are instantiated and those phenomenal properties are not instantiated. This is a claim about the 2-impossibility of P and \sim Q. Taking our world, w_1 , as actual, the primary intension of P are the microphysical properties instantiated in our world, MPw_1 , and the primary intension of Q is the phenomenal property of pain instantiated in our world, Qw_1 . This fixes the secondary intensions of these terms in all possible worlds. Materialists claim that there is no possible world in which MPw_1 and \sim Qw_1 , that is, that P and \sim Q is not 2-possible. But, says Chalmers, if P and Q have the same primary and secondary intensions then it will be possible to go from 1-conceivability and 1-possibility to 2-possibility. If the extensions of P and Q are the same in every possible world then to 1-conceive of a world where P and \sim Q is to conceive of a world in which the microphysical and phenomenal properties instantiated in our world, MPw_1 and Qw_1 , are not co-instantiated, and that is to conceive of a world where it is 2-possible that P and \sim Q.

6.14 To justify Premise (3) Chalmers must thus argue that, unlike 'water', P and Q have the same primary and secondary intensions. In the case of Q, Chalmers says that this is plausible because there is not the same dissociation between appearance and reality in the phenomenal case. Thus, unlike the water example, it is plausibly not possible for something (Qw_2 - pseudo-pain) to resemble pain in all its reference-fixing respects, that is, to feel like pain, without being pain. P is more difficult because a materialist could argue that we use theoretical roles based on dispositional profiles to fix the reference of P-terms. In which case, the primary intension of a P-term like 'mass' would pick out whatever it is in the relevant centred world, w_2 , that plays the theoretical

role that mass plays in our world, w_1 . Thus the primary intension of 'mass' in w_2 could be pseudo-mass whilst its secondary intension was whatever it is in our world, w_1 , that plays the mass-role - real mass. This could be the case for all microphysical properties, so that P had different primary intensions in w_1 and w_2 . But, says Chalmers, this would require microphysical properties in w_2 , like pseudo-mass, to have the same dispositional profile as mass in our world, w_1 , so that pseudo-mass could perform the same theoretical role as mass in our world, but to have a different intrinsic quality. And, more generally, this would mean that our world and a counterfactual world, w_2 , could instantiate microphysical properties with the same dispositional profiles but with different intrinsic qualities, so that the truth of P and $\sim Q$ in w_2 would establish the 1-possibility but not the 2-possibility of P and $\sim Q$. On this view what necessitated the instantiation of Q in our world would be the instantiation of microphysical properties with both their dispositional profiles and intrinsic qualities. And this, says Chalmers, is Russellian monism. This explains Chalmers' disjunctive conclusion. If P and $\sim Q$ is 1-possible, then either P and $\sim Q$ is 2-possible, because the microphysical properties are exhausted by their dispositional profiles and P (as well as Q) has the same primary and secondary intensions, or Russellian monism is true. Once Chalmers has justified Premise (3), Premises (4) and (5) straightforwardly follow.

Jaworski's response to Chalmers' conceivability argument

6.15 What is important for present purposes is not so much the controversy surrounding the premises of Chalmers' argument but whether it provides a way of distinguishing between Jaworski's mind-body theory and those of his physicalist rivals, and what it tells us about the hard problem, particularly Chalmers' use of Russellian monism. Jaworski's response to Chalmers' argument is to reject Premise (2) and the claim that conceivability implies possibility¹⁵⁷. Like predicates, says Jaworski, not every concept need correspond to a property. And on Jaworski's view of properties, properties constrain the space of metaphysically possible worlds. An inventory of all sparse properties (with their property bearers) would determine the realm of possible worlds. We might think that we can conceive of a possible world falling outside of this realm by using a concept that does not correspond to a sparse property but this would be an illusion; there would be no possible world corresponding to the scenario that we had conceived of by using that concept. This means that even if we can conceive of a scenario in which P and $\sim Q$ this does not mean that there is any world in metaphysical space corresponding to this scenario. So, contrary to Premise (2), we can't go from P

¹⁵⁷ Jaworski's response is set out in Jaworski (2016), at pp. 260 et seq.

and $\sim Q$ being 1-conceivable to P and $\sim Q$ being 1-possible. Compare the case to the case where someone claims to be able to conceive of a scenario where there is a world, w_2 , which is physically exactly similar to our world, w_1 , and where salt in w_2 is placed in water in exactly similar circumstances in which salt is placed in water in w_1 , but where the salt in w_2 does not dissolve. On Jaworski's view of properties, in which the laws of nature are metaphysically necessary, there is no possible world corresponding to this scenario and so it is not possible to go from the conceivability of the scenario, if it is conceivable, to its possibility. Jaworski's response, however, does not provide a way of differentiating Jaworski's position from his physicalist rivals. Jaworski does not claim that his response is new but that: "If there is any novelty in the response that I articulate, it is in the way it situates some well-rehearsed points within a hylomorphic framework."¹⁵⁸. Thus a physicalist, at least one with Jaworski's theory of properties, could adopt the same response. So even if we assume that Jaworski's response is successful it leaves Jaworski in a similar position here as he was in relation to the exclusion problem. I argued above that the exclusion problem does not provide a basis for differentiating Jaworski from his physicalist rivals because both Jaworski and the physicalists can claim to be able to solve the problem, albeit in different ways. Similarly Chalmers' conceivability argument does not differentiate Jaworski and the physicalists, but in this case because Jaworski's solution is one that is potentially available to his physicalist rivals. More importantly, the proposed solution, whether offered by Jaworski or the physicalists, still leaves the hard problem of consciousness itself unsolved. Even if Jaworski and the physicalists have a response to the conceivability argument they have still not explained why physical activities or the coordination of such activities should be accompanied by phenomenal properties. To say that such properties are nothing over and above such activities or their coordination still seems to leave us with this mystery.

Russellian monism, the identity theory of powers, and the hard problem

6.16 Chalmers' conceivability argument invokes Russellian monism to address the point that there may be more to physical properties than their dispositional profiles. Chalmers describes Russellian monism as "the view that consciousness is constituted by the intrinsic properties of fundamental physical entities: that is, by the categorical bases of fundamental physical dispositions". Chalmers says that this view "holds the promise of integrating phenomenal and physical properties very tightly in the natural

¹⁵⁸ Jaworski (2016), p. 260.

world”¹⁵⁹. Jaworski’s identity theory of powers, which is similar to Russellian monism, potentially holds out the same promise. I introduced Jaworski’s identity theory of powers in Section 2. Jaworski acknowledges that his theory is a version of Heil’s identity theory, which claims that every property is both qualitative and dispositional¹⁶⁰. Heil sets out his identity theory as follows:

If P is an intrinsic property of a concrete object, P is simultaneously dispositional and qualitative; P’s dispositionality and qualitativity are not aspects or properties of P: P’s dispositionality, Pd, is P’s qualitativity, Pq, and each of these is P: Pd = Pq = P¹⁶¹.

It is open to both physicalists and hylomorphists to adopt versions of the identity theory of properties. Physicalist proponents of such a theory could still claim that the basic properties of physics are ultimately the only properties that there are. It’s just that physics, on this view, only characterises the basic properties in terms of their dispositional profiles and that such characterisation does not exhaust their nature. Whether such a view satisfies Jaworski’s core thesis of physicalism that everything can be exhaustively described by physics may be questionable. For present purposes, however, I will assume that both Jaworski and his physicalist rivals can adopt versions of Heil’s identity theory and thus potentially use it to address the hard problem of consciousness.

6.17 The problem for physicalists when faced with the hard problem is that they are usually operating within a purely dispositional framework. As property monists they are committed to an ontology restricted ultimately to the basic properties of physics. If they then characterise such properties in purely dispositional terms they are faced with trying to analyse the qualitative properties of consciousness in purely dispositional terms. If, however, they adopt the identity theory of powers they potentially have a way

¹⁵⁹ Both quotes are from Chalmers (2010), at p. 133.

¹⁶⁰ See Jaworski (2016), p. 53.

¹⁶¹ Heil (2003), p. 111. Taylor distinguishes the identity theory of powers from Russellian monism on the basis that Russellian monists “accept views of properties on which the qualitative/categorical properties are *distinct* from dispositional ones” - Taylor (2018), p. 61. Italics in original. On this view of Russellian monism it is a different view of properties than that proposed by the identity theory of powers.

around the hard problem¹⁶². If all properties are simultaneously dispositional and qualitative then, so the physicalist can argue, it is not surprising that, for example, the instantiation of pain has both a dispositional profile and a qualitative feel. By adopting the identity theory physicalists will potentially be able to explain not only why pain arises from certain stimuli and typically gives rise to certain behavioural responses but also why pain has the unpleasant feel that it does. The identity theory of powers also provides a straightforward way of dealing with the conceivability argument. If we have two ways of characterising the same property, using dispositional and qualitative concepts for the same referent, then this explains why we seem to be able to conceive of a world in which the instantiation of property P has its dispositional profile but different or no qualitative characteristics. But if property P's dispositionality, Pd, is P's qualitativity, Pq, and each of these is P: Pd = Pq = P, then the conceivability of such a world is not a reliable guide to its possibility. This ties in both with Chalmers' use of Russellian monism in the refined conceivability argument and with Jaworski's claim that not every scenario corresponds to a possible world.

6.18 There are problems, however, for physicalists when they seek to use the identity theory of powers in this way. First, the identity theory goes with a sparse view of properties. The explanatory relevant properties of the relaxed physicalists could not be combined with this theory. Relaxed physicalism only purports to provide a physicalist account of the propositional attitudes and the psychological aspect of the mental and so this is not a direct challenge to such an account. Assuming, however, that there is more to the mental than this, namely its qualitative side, this means that relaxed physicalism can at best give only a partial account of the mental. Secondly, type or token identity physicalists who seek to avail themselves of the identity theory of properties to account for the qualitative aspect of the mental arguably face a problem analogous to the problem that I claim that they face in relation to providing a satisfactory principle of composition. My discussion of different principles of composition in Section 5 above relied on the distinction between collective and emergent properties. A physicalist ontology can only provide for collective properties, consisting ultimately in the collective instantiation by basic particles in complex arrangements of their basic properties. It is unclear how, even with the identity theory, physicalists can explain how the instantiation of such collective properties can compose one person's pain. This is analogous to van Inwagen's claim that thinking

¹⁶² On the use of the identity theory to solve the problem of consciousness and the zombie problem from within the physicalist camp, see Heil and Robb (2003), p. 189, and Heil (2003), chapters 19 and 20.

cannot be regarded as a mere collective activity but must be understood as the holistic property of a composite object that thinks. In the phenomenal case, this type of criticism has been levelled against panprotopsychists, who propose that fundamental physical particles have protoconscious states and then use such states to account for the emergence of conscious mental states. As Jaworski says in his consideration of this position, panprotopsychism assumes that protomental properties are aggregative properties like mass (what I am calling collective properties) and that it is unclear how such protomental properties could aggregate to constitute the qualitatively rich conscious states of mental creatures like us¹⁶³. Chalmers raises the same problem in relation to Russellian monism¹⁶⁴. He says that our phenomenology has an underlying homogeneity and appears to have a single subject of experience. And that it is not easy to see “how a distribution of a large number of individual microphysical systems, each with its own protophenomenal properties, could somehow add up to this subject of experience with a rich and specific structure. Should one not expect something more like a disunified, jagged collection of phenomenal spikes?”¹⁶⁵.

6.19 Chalmers goes on to say that some Russellian monists appear to hold that they can avoid this combination problem by holding that phenomenal properties are the intrinsic properties of higher level physical dispositions. Chalmers says that this view seems to be untenable because if the lower (fundamental) level of physics is causally closed then the higher level properties will be epiphenomenal. And that the only way to avoid this would seem to be to deny microphysical causal closure, so that there are higher level properties that are casually efficacious and have phenomenal properties as their grounds. Jaworski’s hylomorphism, however, provides an alternative way of addressing this problem. Jaworski says that his hylomorphic structures have the same characteristics as any other properties within his metaphysics¹⁶⁶. They must thus comply with his identity theory of powers. And this potentially provides a way of explaining why when, for example, I stub my toe and coordinate the activities of the relevant neurones, muscles, nerves and so on pain-wise, this coordination could not take place without the feeling of pain. On Jaworski’s account this involves an activity-making structure that, like any property, can be described in both dispositional and non-dispositional terms. So my claim on Jaworski’s behalf is that his account of hylomorphic

¹⁶³ See Jaworski (2011), pp. 231 et seq.

¹⁶⁴ See Chalmers (2010), p. 136.

¹⁶⁵ Chalmers (2010), p. 136.

¹⁶⁶ See Jaworski (2016), p. 94.

structure, in combination with the identity theory of powers that he adopts, potentially enables him to propose an answer to the hard problem that avoids the combination problem that is said to undermine the accounts of the panprotopsyichists and Russellian monists. As with my proposed claim on Jaworski's behalf in relation to providing a satisfactory principle of composition, however, the question is whether Jaworski's causal pluralism and the structural realism that he develops on the basis of that pluralism, can do the theoretical work required of it. Are his hylomorphic structures 'real enough' to be simultaneously dispositional and qualitative in the sense required to explain, for example, both our pain behaviour and the qualitative feel of pain?

Does Jaworski's hylomorphic theory of the mind-body relation deserve to be taken seriously?

6.20 This completes my assessment of Jaworski's theory of the mind-body relation and the comparison of his theory with the theories of his physicalist rivals. My assessment proceeded in two stages. First I considered the relative merits of Jaworski's hylomorphic theory and various physicalist theories as general metaphysical theories or worldviews. Secondly, I compared the merits of Jaworski's hylomorphic theory of the mind-body relation with physicalist mind-body theories. Both stages of the assessment concluded that arguments can be made on Jaworski's behalf supporting his hylomorphic theory in preference to the theories of his physicalist rivals but that the success of such arguments depend on Jaworski's realist credentials. Jaworski's hylomorphic theory of the mind-body relation can be seen as an attempt to provide a non-physicalist solution that is motivated by the failure of the physicalists to provide satisfactory mind-body theories from within their limited ontological resources. His attempt rests heavily on his causal pluralism and the hylomorphic structural realism that he constructs on the basis of it. I consider that my assessment of Jaworski's hylomorphic mind-body theory has shown that it should be taken seriously, at least as seriously as more familiar physicalist theories in the philosophy of mind. Along the way I have also referred to grounds for preferring Jaworski's theory to mind-body theories drawing on more robust forms of emergentism or on Russellian monism. The concern over his realistic credentials, however, remains and suggests that the final assessment of his mind-body theory may be that he has not been prepared to pay a sufficiently heavy metaphysical price to enable him more effectively to compete with his physicalist rivals.

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