

Physicalism, Pluralism and Causal Completeness

On The Metaphysical Foundations for Philosophy of Mind

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Abstract

The so-called Exclusion argument (Kim 2000; Papineau 2004) about mental causation applies one premise that is typically accepted without much discussion: the thesis of causal completeness of the physical domain (CCP). In part one I evaluate Papineau's (2001) argument for the CCP. I argue that this argument is not satisfying and that it is incomplete. The rest of the thesis is dedicated to an alternative to physicalism, namely ontological *pluralism*. Part two covers parts of Nancy Cartwright's work (1983; 1999; 2007; forthcoming) and I account for her pluralism in causation. In part three I present and discuss metaphysical pluralism as argued for by John Dupré (1995). In the final section, I balance pluralism against physicalism. On the basis of that discussion I end with outlining an argument for ontological pluralism. My overall goal is mainly two things. I aim to show (i) that physicalism is not the only serious alternative to dualism, and (ii) that it is feasible to regard ontological pluralism, which I consider a type of philosophical materialism, as 'the scientific metaphysics'.

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Introduction

The overall problem at hand is how to understand the mind and its place in the natural world. My motivation for taking this problem serious is an aspiration for making sense of humans as autonomous and rational agents, and of understanding and explaining subjectivity, experientiality, morality, rationality, intentionality and content (linguistic meaning; semantic) in the natural world. In the literature one will see that in providing an answer to this we might form a theory about the mind (e.g. dualism, functionalism or identity theory). We could, however, flip the coin and ask into what we are trying to fit the mind; what is the ontological nature of the world of which we have a hard time finding room for the mind to act in? This thesis starts off by sketching out the problem of mental causation. Part one concerns an argument for the doctrine of causal completeness of the physical domain. Part two and three explore an often-ignored alternative to physicalism, namely ontological pluralism. My aim, in general, is to show that physicalism is not the only serious alternative to dualism. Moreover, I hope to say something about how philosophers conduct metaphysics.

1. Mental Causation and Physicalism

1.1 The Problem of Mental Causation

How, if at all, can we understand that mental properties – such as people holding beliefs and having desires – can be causally relevant in the production of bodily behaviour? We need to distinguish between two different interpretations of the phrase ‘bodily behaviour’ in this statement. With the first understanding we ask whether (and how) mental properties can cause ‘actions’; and with the second interpretation our question is whether (and how) mental properties can cause ‘physiological movements’. By ‘physiological movements’ I mean certain specific changes in the natural world. The natural world is what is subject to the natural sciences such as physics, biology and chemistry (among others). The reason for this distinction is that one might argue that mental properties are causally relevant in the production of *actions*, but at the same time deny that mental properties are in any way relevant in the production of *physiological movements*, i.e., it is not until we characterise a piece of bodily movement as an action that we need to bring in mental properties; and when we do so (refer to bodily movement as an action, that is) certain mental properties are necessary in order to make the action intelligible. It should be noted, however, that within this conception of the problem one is still left with how to explain the relation between mental properties and the physical world in which they bring about changes – the physical changes constituting the particular actions. That is to say, even when characterising a piece of bodily behaviour as an action we have a problem of explaining the relation between the mental properties (a person’s desires and beliefs) and the physical changes it produces, whether it is an arm’s movement when throwing a rock, the rock flying through the air, or the shattering of the window. This fundamental problem – how beliefs and desires are causally related to the movement of matter – is there to be dealt with within both conceptions of the problem; it just looks slightly different by interpreting ‘bodily behaviour’ as an action. This reading of the problem of mental causation is not what I have in mind in this discussion, however. I approach this issue by understanding our present concern the following way: how can we understand that mental properties can be causally efficacious with

respect to changes in the natural world? Put more differently, it is the problem of whether higher-level properties can cause changes at a lower level (often called ‘downward causation’) that interest me.¹

1.2 Where we’re at

The dominating stance on this matter among contemporary philosophers is some sort of ‘physicalism’. Physicalism, in general, can be understood as the doctrine stating that everything that exists either *is* physical, or *supervenes* on the physical. In discussions about supervenience it is common to speak in terms of *realization*, whereby a set of physical properties, *P*, realize another set of properties, *M*, just in case the instantiation of (the properties in) *P* is sufficient for the instantiation of (the properties in) *M*. Such a criterion leaves room for the *multiple realizability*-thesis, which says that different (kinds of) physical systems are capable of realizing one and the same (kind of) property. This has led many defenders of the thesis to the conclusion that the supervenient properties cannot be understood as reducible (hence *non-reductive physicalism*). See for example John Bickle’s online article *Multiple Realizability* (2008) for a thorough discussion.

There are several arguments in favour of physicalism, but the most powerful one is probably the so-called Exclusion argument (Kim 2000), also known as the Causal argument (Papineau 2004), which applies the problem of higher-level, or downward causation. Three key premises constitute the argument. The first states that mental properties are causally efficacious (the causal efficaciousness of the mental, or CEM for short); the second claim is that the physical domain is causally self-sufficient, complete or closed (the causal completeness of physics, or CCP for short); and finally the premise that effects are not systematically overdetermined by distinct causes (no

¹ One way of understanding this problem may involve issues from mereology. In that case the problem may be stated as the following: regarding a compound object, are there properties appearing at a higher level of investigation responsible for the behaviour of its component parts?

overdetermination, or NOD for short). A reductive account of the mental is taken to follow. From here onwards I will refer to this argument as the *Causal Exclusion argument*.

If we want to escape the conclusion we need to deny (at least) one of the premises. A denial of the first premise (CEM) results in an endorsement of epiphenomenalism. The insistent worries that the epiphenomenalist needs to account for are how we are able to report – and acquire knowledge about – mental states (e.g., that I am in pain, that I am consciously aware of x , that I believe that φ , that I intend to ψ , and so on). The third premise (NOD) is an intricate issue and I will only say a few things to indicate how it is possible to respond to this.

When we are trying to explain what overdetermination amounts to we usually illuminate the issue by appeal to examples more familiar, or commonsensical to us: a house fire is caused by both a short circuit and a bolt lightning; two bullets are fired and hit the heart simultaneously causing the death of a poor victim. The effect, E (e.g., the house fire or the death of our victim), it is commonly said, is overdetermined by two distinct causes, A (e.g., a short circuit or one of the shots) and B (e.g., the bolt lightning or the second shot), if both A and B separately are sufficient for the bringing about of E . Two criteria of overdetermination may thereby be stated as follows: E is overdetermined by A and B if (i) A had happened without B , E would occur, and if (ii) B had happened without A , E would occur. (See: Bennett 2004, p. 8) The difficulty with these examples, and why they only can serve as a useful *analogy* to illustrate the issue in question, is that the two causes that overdetermine the effect are separate and independent of each other, i.e., they are not connected or related in the same way that most philosophers think that the physical and mental properties in question are (that is, by supervenience). This point is heavily discussed in the literature.² One possible way of responding to the worry about

² See e.g. Lowe (2003), Melnyk (2003), Menzies (2003), and also Bennett (2003) for discussions concerning mental/physical overdetermination.

overdetermination is to question if overdetermination really is such a rare phenomena as we take it to be. Ted Sider (2003) asks us to consider some examples that – if we accept them – will show that overdetermination is, as a matter of fact, a widespread phenomenon. His examples are these: an effect, *E*, is overdetermined by some micro-objects and a macro-object composed of those objects; *E* is overdetermined by some micro-events and a macro-event composed of those events; *E* is overdetermined by an object and an event involving that object; *E* is overdetermined by an object and a fact involving that object; and finally, *E* is overdetermined by a fact and a corresponding event. (Sider 2003, p. 1) The question, if we accept these cases, is then this: is mental/physical overdetermination *as* acceptable? I do not wish to elaborate any further on this; what I have said indicates one possible way to respond to the seemingly unsolvable problem of mental causation. Let me instead turn to my main subject of concern, the second premise in the Causal Exclusion argument.

The premise stating the CCP in the argument is typically accepted without much discussion. The thesis that the physical domain is causally self-sufficient, complete or closed is widely viewed as a firm and undisputable cornerstone in contemporary discussions about mind and physicalism. I want to direct my discussion towards this premise and question the thesis itself. I want to evaluate this principle, and will do so through three different (though related) discussions. First I will evaluate Papineau's arguments (2001); second I will present Cartwright's ontology and her argument against the CCP; and finally I will look at the pluralistic ontology presented by John Dupré (1995). I believe that my considerations of the above-mentioned will show that physicalism, maintained on the basis of CCP, is *not* the only game in town, and what is more, what is often considered to be *the* reasons to believe in physicalism are in fact not well supported by contemporary science; the assumptions underlying arguments for physicalism are, in fact, at odds with what science tells us about nature.

1.3 Varieties of the CCP

There is a large number of different formulations out there of how to understand the CCP. Different formulations yield different understandings; and different understandings may lead to different discussions. Despite the different formulations that appear in the literature there are two main varieties of which we need to be clear. We have to discern between the weaker and stronger notion of the principle. As a first approximation we can understand the weaker reading of the principle – let us call this *completeness* – to say that all physical events have complete physical causal stories. This should not be confused with the stronger claim that nothing non-physical can (causally) interact with the physical realm. This is what I will refer to as ‘closure’. In short, what is at stake here is whether or not there is room for overdetermination. Let me render two formulations appearing in the literature. Papineau (2004, p. 17) defines what he calls ‘completeness’ as follows:

(CCP) “All physical effects are *fully caused by purely* physical prior histories.”
(Italics edited by author.)

Cartwright (forthcoming, p. 1) puts what she calls ‘closure’ this way:

(CCP*) “Are there (in God’s great Book of Nature) laws of physics that dictate everything that happens in the natural world? Or, more narrowly, everything that happens in the physical world?”

It appears to me that they should switch labels on their definitions. The crucial elements in Papineau’s formulation are the phrases “fully caused by” and “purely”. This formulation makes no claim on how to understand causation, i.e., it is neutral with respect to the question whether causation is deterministic or probabilistic. It does not include the claim that physical effects have a *sufficient* cause, and it does not rule out the possibility of an effect being overdetermined by multiple physical causes. But what this formulation must be taken to rule out is the possibility of an effect being

overdetermined by two distinct causes, one of which is physical and the other mental. In other words, this seems to be the stronger formulation of causal *closure* rather than *completeness*. Cartwright's definition, on the other hand, says nothing which would rule out the possibility for overdetermination. If there exists physical laws that "*dictate* everything that happens in the natural world" (italics added by author), it could still be the case that there was a simultaneous non-physical cause for the physical effect in question. Therefore, it seems like Cartwright's definition would most properly be labeled 'completeness' rather than 'closure'. Although she uses the notion of 'dictate', which indeed is a bold causal concept (because, unlike Papineau's, it seems to suggest causal determinism and sufficiency), it appears to me that this notion does not rule out overdetermination. If a physical effect, E , at time t_1 has a sufficient physical cause, A , at time t_0 , it could still be the case that the physical effect E (at time t_1) has a non-physical cause, B , at time t_0 distinct from the relevant physical cause, A . The sufficient physical cause (A) could still be said to 'dictate' its effect.³

For a more precise and unmistakable understanding of the difference between weak and strong CCP, let me reiterate Montero's (2003, pp. 174-175) definitions.

(Completeness) "Every physical phenomenon that has a sufficient cause has a sufficient physical cause."⁴

³ One might object that it is not clear whether or not the notion of 'dictate' should be understood this way. It is not important to me, however, to settle on either one or the other interpretations of Cartwright's formulation. My point, rather, is that we should be clear and precise in our definition when discussing this issue. Cf. Papineau's formulation: what he labels 'completeness' is in fact a stronger principle, i.e., it rules out physical/mental overdetermination, and this cannot be established *only* on the basis of showing that physical effects have complete physical histories.

⁴ There are two things to say about this definition. First, the principle as defined by Papineau (see above) seems to be too strong: we do not want it to rule out the possibility that there are (physical) phenomena without a cause (e.g., it is not clear whether or not the big bang, which seems to be physical, had a cause). (Montero 2003, p. 174) And second, it is suggested that quantum mechanics provides us with reasons to doubt the CCP. The solution to this objection is to interpret 'sufficient cause' as a cause that either fully determines its effects or fully determines the *chances* of its possible effects. (Papineau 2004, p. 17)

(Closure) “Physical effects have only physical causes.”

Note that if one chooses to adopt the stronger thesis of closure the Causal Exclusion argument would be simplified to consist of only two premises.

1. (CEM) Mental properties cause physical effects.
2. (Closure) Physical effects have only physical causes.

Thus: Mental causes are physical causes.

In the following it is the weaker definition of the CCP that is of my concern – the causal *completeness* of physics. In other words, it is arguments for the statement that *every physical phenomenon (that has a sufficient cause) has a sufficient physical cause* that will be treated here. In what follows it is this I have in mind when I write ‘CCP’.⁵

1.4 What is ‘Physics’?

Before I can move on to the discussion of the CCP-thesis I will have to address a terminological issue. It is not obvious how we are to understand ‘physics’ when discussing the Causal Exclusion argument. The question can be straightforwardly stated as follows: what should count as something physical? In answering this question we would, presumably, say something about the very nature of the things that make up the possible self-sufficient domain. One worry, if we operate with an

⁵ See also Eric Marcus’ paper *Mental Causation in a Physical World* (2005) for an interesting discussion of the relation between the weaker and stronger readings of the CCP, and how to respond to Causal Exclusion argument. Noteworthy is the fact that he does not question the validity of the completeness-thesis. His point is that the veridicality of mental causation is not ruled out by the completeness-thesis. You can accept the causal completeness of the physical and at the same time have mental causation. “Tracing the causal ancestry of a physical event need not take us outside the physical domain; but it might if we let it.” (Marcus 2005, p. 33) In his conclusion, however, Marcus makes it perfectly clear that he has not shown how mental properties are, or can be, causally *relevant* in the production of bodily movement. I.e., how mental properties can make a difference in what happens in the physical world. What he has shown is that even a robust physicalistic metaphysic, namely causal completeness of the physical domain together with mind-body supervenience, poses no threat to mental causation. (Marcus 2005, p. 45) Or so he argues.

unstinting conception, is that the CCP-thesis comes out as trivially true. In other words, we need to tighten our conception of ‘physics’, but by how much? Due to the persistent progression in science it would be unwise to limit the term ‘physical’ only to the entities and properties existing in present physics. New concepts will without a doubt emerge in future science, so if we tie the meaning of ‘physics’ to present day physical entities (fundamental particles, properties, laws, forces and so on), the thesis is most likely to come out plain false. So the appropriate formulation of what physical properties and entities are, would be something like the following: the properties and entities postulated by the ultimately true theory of physics. There is a problem of understanding this because of our ignorance of what entities and properties this ultimate true theory of physics will eventually include. Many (e.g., Spurrett & Papineau 1999, among others) seems to think that as a result what is more important is to find out what ‘physics’ does *not* include; what should count as non-physical? It is common to simply assume that the concepts of tomorrow’s physics do not include mental properties (and/or entities) or any other ‘dubious’ properties (and/or entities). Following that line of thought, a definition of what something physical is would be to simply call it ‘non-dubious’. I am sceptical to this broad conception of physics, but the reason I take note of this is that I want to account for a point Vicente (2006, p. 150) makes. “[T]he mind has classically been the focus of the present argument [the Causal Exclusion argument], but the argument can be ‘exported’ to any dubious domain, as long as the instantiation of dubious properties seem to bring about physical effects.” I reckon this to be an important point. This will be elaborated on and clarified in the next section. But first, it is time to turn to the arguments for the CCP.

1.5 Arguments for the CCP

Papineau (2001; 2004) presents an argument (or rather two intertwined arguments) that, according to him, illustrates that there is “little room for doubt about the doctrine [the CCP]” (2004, p. 255). The arguments (Papineau 2001, pp. 27-30) are these:

The Argument from Fundamental Forces. The argument assumes that every *prima facie* special force reduces to a limited set of basic physical forces, which conserves energy. Although this is no knock-down argument (because it is consistent with the existence of special forces as long as they themselves are conservative, though “there are no obvious grounds for expecting such *sui generis* special forces to be conservative” [Papineau 2001, p. 28]), there is inductive reasons for believing in the CCP: the increasing capacity of physics to explain phenomena by means of this limited set of forces. This argument finds its evidence in yet another argument: *the argument from physiology*. The latter argument is basically that the development of biochemistry and neurophysiology provided negative evidence against mentalism and vitalism; no non-physical forces were ever found.

In what follows I will evaluate this argument in detail because there is much going on in this argument that needs to be addressed. What I will do is to point out different ways to respond to this argument. There are certain presumptions that I want to comment on, and further, I will present an objection to the validity of the argument itself. My claim is basically that the argument, as presented by Papineau, is incomplete. As will be clarified, I am stressing that the second step in his argument (the argument from physiology) is based on a gratuitous assumption. My objection is partly sustained on the basis of a plea for a sufficiently precise conception of the term ‘physics’. If the desired goal is physicalism, it is not sufficient to show the reducibility of one higher level to the next lower level. (E.g., to show the reducibility of sociology to psychology, or psychology to biology, and so on.) What one has to do – again, if the desired goal is physicalism – is to show the reducibility of every level above physics (including biology, neurophysiology and chemistry) down to physics.

Let me start with the first part of the argument – the argument from fundamental forces. It is not completely clear how we are to understand the term ‘force’ here. But first, even if we were to spell out Papineau’s understanding of this notion, there is an objection I want to address that is targeted at one crucial presumption in his discussion. Through and through Papineau makes it clear that what is at stake in his

argument is the claim that there are mental (or vital) *forces* acting on physical bodies. However, it seems obvious that one does not have to maintain the claim that special mental *forces* exist in order to object to Papineau's arguments.

There are two ways to do this. The first is to say that the conception of a mental 'force' misses the point. Even if one maintains that there are non-reducible (causally efficacious) mental properties, these cannot be associated with any higher-level 'special force' as such. This line of objection is connected to one's conception of causation, and it is not clear why we should accept Papineau's account of causation (that causation involves the transmission of forces) instead of a more modest conception of the ontology of causation, e.g. that causes are basic particulars (Davidson 2006). The second route, as indicated above, is to question the meaning of the term 'force' as he uses it. It is not completely clear why, if we take the mental entities in question *not* to amount to a kind of special force but rather as a set of properties, this cannot be captured (or included) by any of the fundamental forces existing in the natural world. Even if it were a matter of scientific fact that every *prima facie* special force reduces to a limited set of basic (physical) forces, we would still not have reduced mental properties to physical properties. I.e., the existence of (non-reducible) mental properties does not *per se* violate the view that there is a limited set of fundamental forces.

In the following section I will clarify my principal objection to Papineau's argument for the CCP. As I have said, it is targeted at the second step of his argument: the argument from physiology.

During the first half of the century the catalytic role and protein constitution of enzymes were recognized, basic biochemical cycles were identified, and the structure of proteins analyzed, culminating in the discovery of DNA. In the same period, neurophysiological research mapped the body's neuronal network and analyzed the electrical mechanisms responsible for neuronal activity. Together, these developments made it difficult to go on maintaining that special forces operate inside living bodies. If there were such forces, they could be expected to display some manifestation of their presence.

But detailed physiological investigation failed to uncover evidence of anything except familiar physical forces. (Papineau 2001, p. 31)

1.6 From Biology to Physics

The question one should ask is how it is that evidence from biochemistry and neurophysiology can provide *the* reason to adopt physicalism. Biochemistry and neurophysiology, after all, are not physics. What Papineau's argument establishes, if they are sound, is not that there is a sufficient *physical* cause for every effect, but rather that bodily movements have a sufficient *neurophysiological/biochemical* cause (the causal completeness of biology, CCB for short).

(CEM) Bodily movements have mental causes.

(CCB) Bodily movements have sufficient *neurophysiological/biochemical* causes.

(NOD) Bodily movements are not causally overdetermined.

If the desired goal is the conclusion that the physical domain is causally complete we need reasons to believe in yet another premise: the reducibility of neurophysiology and biochemistry to physics. Such a step would presumably look like the following argument. (The abbreviation CEB standing for 'the causal efficaciousness of biology'.)

(CEB) Bodily movements have neurophysiological and biochemical causes.

(CCP) Bodily movements have sufficient physical causes.

(NOD) Bodily movements are not causally overdetermined.

The conclusion would be that neurophysiological and biochemical causes *are* physical causes. But this is where the trouble begins. Remember that the argument from physiology (summed up in the first premise [CEB]) is supposed to provide *the* reason to accept CCP – the second premise. So it looks like we are jumping over the step that would take us from, say, the second or third lowest level (the level of

neurophysiology and biochemistry) to the bottom level of physics. Such an argument, if we follow the line of Papineau's argument, would be something like the following. Development in physics provides negative evidence against neurophysiological and biochemical properties: when scrutinising the underlying (physical) process of a presumed neurophysiological and biochemical cause, we fail to reveal any neurophysiological and biochemical properties. So, should we expect this to be the case? Papineau must surely think so. I believe that the only right thing to do is to turn to one of the sciences that deal with one of the levels in question. Later on I will account for a point emphasised by systems biologists. As will be clear they argue against this assumption of reduction by considerations from biology.

If Papineau is right in that the best reason to accept the CCP is the argument from physiology, it looks like the latter argument of the two above is left with a question hanging over it: the first premise above (CEB) is what provides us with the reason for accepting the second premise. That is to say, one of the premises included in an argument with the purpose of showing the reduction of neurophysiology and biochemistry to physics is already assumed to be true. I maintain that an argument constructed with the purpose of establishing the CCP must show exactly this: the reducibility of neurophysiology and biochemistry to physics hence cannot make use of the CCP. So if we take the argument put forward by Papineau to be favourable, we should be recognising the fact that the argument is not complete. It would be complete, however, if we add one further premise or assumption: If we assume that all the levels belonging to the natural world (physics, chemistry and biology) *are* physical, the argument will go through. I have illustrated how such a presumption *cannot* be established if we want to make use of Papineau's argument for the CCP.

There is one point that I need to address on behalf of Papineau. His point is not so much to show the reducibility of every level (above physics) down to the lowest level, but rather to show that any *dubious* property can be subject to the causal argument. This is what he stresses in his paper *A Note on the Completeness of 'Physics'*, co-authored with Spurrett (Spurrett & Papineau 1999). This, as mentioned

earlier, is also what Vicente (2006, p. 150) points out. Let me turn back to the difficulty of specifying the scope of ‘physics’. If we assign all the properties, laws and entities discovered by physics to the term ‘physical’, the CCP is most likely to come out as plain false. So the question remains: what should count as something physical? It is not obvious how such a question might be answered. And remember, this has lead many to think that, therefore, what is more important is to determine what should *not* count as something physical: *what does ‘physics’ not include?* One tempting way of answering this question is to run *any* dubious properties through the Causal Exclusion argument (Cf. Vicente). But, obviously, this would be invalid. We cannot to do this if the purpose is to determine what entities should count as physical entities in order to apply the CCP. The circularity is conspicuous.

What Papineau assumes, which he has not given any sufficient arguments for, is that there is some bottom level of investigation that is responsible for everything that happens in the natural world. This is (partly) because of the incompleteness of the scientific practice of physics. We simply do not know enough about the physical world to conclude that this level of reality is responsible for everything that happens in the natural world. He makes use of certain presumptions that, although plausible, are not as well-supported by scientific research as he takes them to be.

I will point to the field of systems biology regarding the question of whether or not this assumption of reductionism is well-founded. I will come back to this at the end of this section. But first, let us be clear on what, exactly, it is that Papineau is assuming. As we have seen he presents us with an argument that has the purpose of establishing the CCP. The crucial premise in this argument is that ‘bodily movements have a sufficient biochemical and/or neurophysiological cause’. This, in turn, is a generalisation by induction from the following observations: “A great deal became known about biochemical and neurophysiological processes, especially at the level of the cell, and none of it gave any evidence for the existence of special forces not found elsewhere in nature.” And further, “detailed physiological investigation failed to uncover evidence of anything except familiar forces.” (Papineau 2001, p. 31) We

have to bear in mind the difference between the latter (negative) observations and the (positive) generalisation (by induction) Papineau claims that follows from them, which, in turn, legitimises the CCP. The crucial part of Papineau's argument does not include or, by itself, entail the unity of the natural sciences, i.e., that all the phenomena revealed by the natural sciences should count as something physical. What I am stressing is that we need to show the reducibility of biochemistry and neurophysiology down to physics if we want to complete the argument. So we can see that in order for a generalisation of this kind to take place he needs to assume that *everything science has ever revealed should be recognised as something 'physical'*. This is how he can maintain the claim that evidence in biology, chemistry and physiology all suggest physicalism. He assumes that functions, properties, events and processes appearing at the level of chemistry, biology and physiology *are*, in some important sense, physical. But, again, this is where he needs an argument. Neurophysiology is not the same as physics; neither is biology nor chemistry. There are, indeed, success stories to be told of the reduction of biological phenomena to chemistry, and successful attempts of reducing chemistry to physics. But these stories are not conclusive in the sense that they can establish the CCP. This is because there are other stories to be told: scientific theories backed up by concrete empirical research data that disagrees with the crucial assumption in Papineau's argument. It is worth noting that Papineau operates with a broad understanding of the term 'physics'. As noted earlier, he seems to be inclined to understand the term as simply meaning non-mental. He "proposes that the causal argument is best developed by tying the meaning of 'physics' to whatever properties are in fact needed to account for such 'paradigmatic physical effects' as movements of matter." (Spurrett & Papineau 1999, p. 26) It should be clear by now that it is this understanding of the term 'physical' that my scepticism is aimed at. I think that this broad understanding is too loose if the desired goal is physicalism. It is quite possible to deny physicalism in other ways than by appealing to the caricatured dualism to which Papineau is opposed. There are other alternatives that are, one might claim, better supported by science than the strict reductionism Papineau is defending; alternatives backed up by scientific theories that are in direct conflict with one or more of the profound ingredients in physicalism.

Dennis Noble (2008) presents us with empirical data revealed by biologists that is in conflict with the assumption expressed above. Systems biologists, such as Noble among others, argue that there are, in fact, non-reducible higher-level properties with essentially explanatory roles. That is, properties that are essential for explaining what we need to explain. The idea is that are certain features (e.g. a function) emerging at the level of biological systems (e.g. an organ or a cell) that are responsible for the behaviour of its component parts (e.g. proteins or genes). The component parts of a biological system realizes certain systems properties – properties that cannot be explained by the parts alone – and these emergent properties in turn influence, and therefore, in an important sense *cause*, the behaviour of the elements at a lower level. (Noble 2008, chap. 4) I say this only to point out that the reductionist programme has its opponents. Systems biologists claim that global bottom-up causation (as expressed by the CCP) is simply false, in that modern scientific researchers have revealed cases of downward causation. I am in no position to evaluate Noble's claims, and I say this only to demonstrate the difficulty with simply assuming that everything that is subject to the natural sciences should be counted as something physical. I wish to emphasise that philosophy, as such, is in no position to answer this; I think it is evident that the question of causal completeness of physics is not something we can solve *a priori*. Rather, it is an empirical question to be answered by science.

2. Cartwright's Stance

I want to dislodge a particular vision of how the world must be if the laws of physics are to be true, a vision of a world where all of physics effects are well-ordered under its laws. We begin, unproblematically, with the idea that there are fundamental particles or fields (or whatever is the best choice from some future ideal physics) and these have certain fundamental features. What is problematic is the next step, the automatic assumption that everything that happens to these fundamental entities must be the result of the interactions of these fundamental features. I offer a picture of a far richer world, one with a vast variety of features, most of which cannot be captured under concepts that could be regimented into systems of relations and measurement procedures that look anything like those of modern mathematical theories in physics and especially not of any one single consistent theory. These features too can affect even the behaviour of fundamental particles. (Cartwright forthcoming, p. 17)⁶

2.1 Introduction

The CCP, as we have seen, plays an important role in the contemporary discussion about mind and nature. The doctrine is widely viewed as a well-supported and therefore an undeniable metaphysical thesis. The thesis, it is said, is supported by contemporary scientific theories in physics: we have good empirical evidence for the completeness of physics. The fundamental particles (or strings or fields, or whatever turn out to be the fundamental building blocks) together with certain basic laws (and maybe also mathematics and logic) are what constitute the complete domain of physics. The question Nancy Cartwright (forthcoming) occupies herself with is

⁶ In this quote we can see that Cartwright is not bringing up the issue whether higher-level features are caused solely by lower-level features or not. Neither is it a question about the causal efficaciousness of higher-level features with respect to changes at that level. Rather, what she is questioning is whether higher-level features can be responsible for changes at the lowest level. This is what we know as 'downward causation'. The first premise in the Causal Exclusion argument is an example of what is at stake: mental causes have physical effects.

precisely this: do we, really, have good empirical support for the claim that the physical domain is ontologically preeminent? Her answer, in short, is ‘no’. In what follows I will give an account of Cartwright’s considerations with regard to her claim that the level of physics is most accurately characterised as an *incomplete* domain.

Cartwright advocates empiricism, and this concerns the justification of our metaphysical theories as well. What she is stressing is that we should have good empirical support for our metaphysical theories if we want to apply them. “We do not have good empirical evidence for the stronger claim [“that physics can (in principle) predict – and predict well – everywhere in its domain”] and without empirical evidence it must not play a role in science.” (Cartwright forthcoming, p. 19)

Cartwright asserts a pluralistic metaphysics. She has presented many different arguments for this in many books and articles, and I will not account for it all. My primary focus will be on the content of a lecture she held in Oslo in August 2008 entitled *The Incompleteness of Physics and the Hodgepodge of Nature*,⁷ and on her paper *Natural Laws and the Closure of Physics* (forthcoming).⁸ I’ve also looked at her books *How the Laws of Physics Lie* (1983), *The Dappled World* (1999) and *Hunting Causes and Using Them* (2007). In this way I have got to know her overall project better. I will also direct my attention to some parts of these works in the discussion that follows.

Let me turn to the argument that is of present concern. Her arguments against the completeness of physics can be roughly summarised as the following:

⁷ On August 28th professor Cartwright gave the Annual Lecture on the Mind in Nature 2008 in Oslo, a lecture organised by the Centre for the Study of Mind in Nature (CSMN) at the University of Oslo.

⁸ The main difference between the two is that in her talk she had a concluding remark about the question whether her considerations leave room for the mind to cause changes at the level of physics.

We comprehend nature as a pluralistic reality, and if we look at the supposed evidence for the CCP – what provides our best reason for believing in the doctrine, namely the empirical successes of physics – this can equally be accounted for by a pluralistic metaphysics.

I want to suggest that we take this claim one step further and say that, *physicalism* – maintained on the basis of the CCP – is not something entailed by contemporary physics, precisely because the empirical observations that we take as evidence for the CCP can equally be accounted for by a different ontology. This is another claim than Cartwright's. You will arrive at my conclusion if you add the assumption that the CCP-thesis is the strongest reason to accept, and the most important ingredient in, physicalism.

2.2 The Dappled World

Let me account for the pluralistic metaphysics Cartwright endorses. She is known for her characterisation of nature as 'messy', or as she often puts it: 'the hodgepodge of nature' and the 'dappled world'. This is a pluralistic world picture where nature is mirrored by the different models we use to produce our best predictions, and by the different causal concepts used in scientific explanations. I.e., the different scientific branches, such as physics, biology, psychology, sociology, economics, and so on, use different models and different causal concepts in predicting and explaining each of their own phenomena. In her talk in Oslo one of her concluding remarks, which I think sums up her ontology quite well, was this: "There is causation from above, from below and from a thousand angles at the side." What she is envisioning here is that, in nature, there is not only causation from the bottom level of physics and upwards. That is to say, physics is not responsible for every occurrence in the natural world; we also have downward causation – features appearing at higher levels responsible for occurrences at lower levels of reality.

We best see what nature is like when we look at our knowledge of it. If our best-supported theories now are probabilistic, we should not insist on determinism. If Russell was right that physics does not employ causes, we should agree with Hume, at least about the basic material phenomena studied by physics. Unity of science is a case in point. How unified is our knowledge? Look at any catalogue for a science or engineering school. The curriculum is divided into tiny, separate subjects that irk the interdisciplinist. Our knowledge of nature, nature as we best see it, is highly compartmentalized. Why think nature itself is unified? (Cartwright 1983, p. 13)

In her paper *Do the Laws of Physics State the Facts?* (Cartwright 1983, pp. 54-73) Cartwright discusses what she calls ‘the facticity view’. It may be summed up with the following question: “[do] laws of nature describe how physical systems behave[?]” Cartwright argues that this cannot be the case. Her argument is based on her view of how scientific physics works *when it works as best as it can*. Her view is that the most accurate predictions, and where we can see to be the most successful in physics, are inside controlled experimental environments. What Cartwright is arguing for is that the theories used in the models of experimental physics make use of physical laws that, essentially, are *ceteris paribus* laws, i.e., they are not universal. The fundamental laws do not state facts about nature but they hold true of entities and processes in models. A fundamental law, e.g., the law of gravitation ($F = Gmm'/r^2$) is thus described this way by Richard Feynman (1967, p. 14):

The Law of Gravitation is that two bodies exert a force between each other which varies inversely as the square of the distance between them, and varies directly as the result of their masses.

Cartwright’s point is that when we are asked to predict where a fallen object will land out in nature, most often it will not suffice to state the law of gravitation. Accordingly the law of gravitation does not truly describe how bodies behave. This is because no bodies behave just as the law of gravitation says, at least not in nature. There will always be many different forces affecting the behaviour of the bodies. So the law of gravitation should most accurately be expressed with a *ceteris paribus* modifier in front:

If there are no forces other than gravitational forces at work, *then* two bodies exert a force between each other which varies inversely as the square of the distance between them, and varies directly as the result of their masses. (Cartwright 1982, p. 58)

2.3 Plurality in Causality

The pluralistic worldview we see Cartwright's portraying is also argued for by considerations of causation. (Cartwright 2007, pp. 9-53) I do not want to evaluate her arguments in all of their details; rather what I want to do is to briefly sketch out her view on causation. This will help us to take hold of her claim (also quoted in the beginning of this section) that higher-level features can "affect ... the behaviour of fundamental particles." (Cartwright forthcoming, p. 17) The following quote is from the introduction to the first chapter in *Hunting Causes and Using Them* (2007, p. 9):

[T]he different accounts of causality that philosophers and economists offer point to different features that a system of particular causal relations might have, where the relations themselves are more precisely described with thick causal terms – like 'pushes', 'wrinkles', 'smothers', 'cheers up', or 'attracts' – than with the loose, multi-faceted concept *causes*.

Cartwright argues for what we can label 'causal pluralism'. This pluralism claims that there are many different kinds of causal laws that operate in many different ways. Her argument is basically that there is not one characteristic feature that all these different cases (of whom we call upon 'causation') share or have in common. Rather, the different kinds of causal processes are equally autonomous. The particular level of investigation and the underlying goal of that investigation is what fix the different kinds of causations. This epistemological argument is based on considerations of the different methods (e.g., in the social sciences) that can provide warrant for a causal conclusion. (See: Cartwright 2007, p. 9; pp. 24-42)

Causation, I argue, is a highly varied thing. What causes should be expected to do and how they do it – really, what causes are – can vary from one kind of system of causal relation to another and from case to case. Correlatively, so too will the methods for finding them. Some systems of causal relations can be regimented to fit, more or less well, some standard pattern or other ... – perhaps we build them to that pattern or we are lucky that nature has done so for us. Then we can use the corresponding method from our tool kit for causal testing. Maybe some systems are idiosyncratic. They do not fit any of our standard patterns and we need system-specific methods to learn about them. The important thing is that there is no single interesting characterizing feature of causation; hence no off-the-shelf or one-size-fits-all method for finding out about it, no ‘gold standard’ for judging causal relations. (Cartwright 2007, p. 2)

What Cartwright is suggesting is a metaphysical thesis which portrays reality as consisting of a patchwork of laws. The idea, as she puts it, is that, in writing the Book of Nature, “God ... writes down each and every regularity that his universe will display. [He then leaves to] Saint Peter ... the gargantuan task of arranging the initial properties in the universe in some way that will allow all God’s laws to be true together.” (Cartwright 1999, p. 33) The metaphysical idea Cartwright is in opposition to is the widely accepted doctrine of (reductive) physicalism. If physicalism is true, what had to be done when God created (and Saint Peter arranged) the universe was to write down all the laws and lay down the initial positions and velocities of all the atoms; and then they needed to calculate all future happenings, including what, if any, macroscopic properties and macroscopic laws will emerge. (Ibid.) The metaphysical pluralism Cartwright endorses “...is the doctrine that nature is governed in different domains by different systems of laws not necessarily related to each other in any systematic or uniform way; by a patchwork of laws.” There is nothing absurd about this world picture. Her claim is that it is, as a matter of fact, a more credible portrayal of reality if we take science, and more general our experience of reality, to be the best guide as to see what nature is like.

There is especially one thing that Cartwright discusses that, in my opinion, is *the* most crucial part in her theory of pluralism. It is about her discussion of laws and her evaluation of them as *ceteris paribus* laws. What Cartwright is stressing, as will be

clear in the following section, is that we have no good reason for invoking universal validity of the fundamental laws of physics. What she is claiming is that we have no *empirical grounds* for taking our laws as universally true, and precisely this – empirical evidence – is what we should demand.

2.4 Two Arguments Against the CCP

Let me turn back to the question as to whether the physical laws truly describe how bodies behave.⁹ The answer, according to Cartwright, is ‘no’. In nature, she points out, there is never just one force at work causing the behaviour of physical bodies; there are always multiple forces acting simultaneously. Her example of a dollar bill dropped from a height illustrates the point. (Cartwright 1999, p. 26-8) It will not suffice to state the law of gravitation if we want to predict where the floating dollar bill will land. This is because there are thousands of other factors affecting the fall of the bill, such as the wind as well as the complexity of the interaction between the dollar bill and air molecules. So the question is where we get our empirical data, which is supposed to support the claim that the fundamental physical laws are universally true, and that they, ultimately, constitute a complete domain responsible for all the occurrences in the natural world? The answer, according to Cartwright, is that what we have – which is what we take to be evidence for the claim that a physical law expresses an actual state of fact – is some experimental set-up under extremely controlled conditions. Her examples of experiments with superconductors or with lasers show us what she has in mind.

There are two arguments against the CCP presented in the paper *Natural Laws and the Closure of Physics* (forthcoming). As I’ve noted above, the arguments themselves draw on her view of how she sees physics working when it works best: when it

⁹ This, as we have seen, is what Cartwright directly asks in her paper *Do the Laws of Physics State the Facts?* (1983). However, the same question is also treated, though indirectly, in the paper *Natural Laws and the Closure of Physics* (forthcoming).

provides accurate and precise predictions. Following this line of thought, we may say that there is a problem for the defenders of the CCP because the situations in which the fundamental laws of physics get empirical support are those when scientists construct experimental environments where they strive for the absence of external forces. That is to say, the physical entities that are subject to investigation are shielded off from the various forces that normally affect them. The experimental set-ups are constructed so as to exclude causal interferences that are not subject to the physical concepts that are subject to, or used in, the current experiment. The external forces that are excluded are every force that is not studied in the particular experiment. What Cartwright is stressing is that when we try to find empirical support for our physical theories – involving giving an account of what causes are at work, and, generally, *describing* what's going on – we make use of highly *constructed* experiments, where the biggest challenge, and what the scientists need to do, is to secure the absence of a huge amount of other causes – causes that normally are at work. The actual picture of nature is that there are a vast amount of complex phenomena whose behaviour is the result of multiple forces. If the fundamental physical laws describe facts, they only describe how things *would* act *given* the absence of a series of causal forces. But the correct picture is that actual processes are the result of a composition of many different causes. So, the laws that describe how physical bodies behave only describe the behaviour inside controlled environments. That is to say, the laws describe how a physical system behaves *other things being equal*. Her point, of course, is not that fundamental particles behave differently inside the laboratory and outside. Her point, rather, is that we need to recognise the difference between “environments that are properly structured so that the laws of physics can act without interferences not subsumed under proper physics concepts and those where the environments are more messy.” (Forthcoming, p. 15)

Again, the laws of physics describe how physical systems behave when they are shielded from the various capacities that normally affect them. In nature we do not see bodies that are affected by one, and only one, force. What we have, rather, is a plurality of causes responsible for the changes (e.g., a movement) occurring in nature.

The knowledge we gain from experiments in physics tells us what *can* happen, not what will happen. (Cartwright 1999, p. 10)

The second argument is established on a meta-consideration about science. She now turns to the concepts used in scientific explanations. In the social sciences there is a distinction between *internal* and *external* validity. Internal validity is when an experimental set-up can ensure that the result really holds in the experimental setting. External validity, on the other hand, is when we can presume validity of target situations outside the experimental setting. One way of seeking external validity is to ‘climb up the ladder of abstraction’. If we describe the outcome of an observation in a more abstract way we buy greater breadth of external validity. The way we can claim external validity is to see the experimental result as an instance of inductive generalisation. Cartwright (forthcoming p. 9) advances this maxim:

“We can buy greater breadth in the inductive generalization that an outcome supports, and hence in the external validity of the outcome, by climbing up the ladder of abstraction in describing that result.”

But there is a well-known problem, she divulges: “[w]hat goes up must come down.” (Ibid. p. 10) In physics we need to translate the general and abstract terms in everyday life back into more concrete terms if we want them to be of any practical use. Physics, above all, is *the* exact science and therefore cannot make use of abstract and general concepts. They need to be precise and reliable, and they need to be subject to concrete measurable quantities. Hence, the physicist’s job it to climb down the ladder of abstraction. Cartwright notes: “These characteristics of the concepts are what gives physics its great powers of precise prediction.” (Ibid. p. 18) Her argument hereof is this: the concepts used in physics do not seem to be applicable to “the great bulk of causes at work in Nature, even of all the causes that can affect the fundamental behaviour of physics’ fundamental entities.” (Ibid.) Importantly, she is not saying that there cannot be such concepts in ‘the Great Book of Nature’. What she is saying is that we do not have evidence in favour of the claim that there are. What

we have evidence for is the claim that physics predicts well within its domain *where it can*. But this, however, must not be confused with the stronger claim that physics in principle can predict everything within its domain. “I have said nothing that argues that there cannot be. But if we are going to give a credible answer – yes or no – to the question of the self closure of physics, ‘might’ is not enough.” (Ibid.)

In questioning the CCP Cartwright has a distinct sense in which some things are legitimated. She insists on the need for empirical evidence with regard to the justification of our metaphysical claims. Many take the empirical success of science to be our best reason for believing in the CCP, but Cartwright disagrees. Her claim is that the empirical success of physics does not argue for the CCP. According to Cartwright what science exhibits, the body of scientific knowledge we have, is, in fact, *the* best proof there is for endorsing pluralism. So the fact that the empirical observations (which we take as constituting our best reason for believing in the CCP) can equally be accounted for by a pluralistic ontology, now turns over to be a sufficient proof for accepting pluralism.

2.5 Cartwright and the Rest of the World

It is conspicuous that in the debate about mental causation few, if any, pay attention to Cartwright’s work; in discussions about mind, metaphysics, science and causation in relation to physicalism we scarcely hear talk of Cartwright’s arguments and considerations. One of the main reasons for this, I believe, is not so surprising once it is pointed out to us. It has to do with the starting point of one’s discussion. Although Cartwright indeed has a lot to offer – she fruitfully contributes – to the discussion about mental causation and physicalism, questions concerning these are not her initial ones, neither is it of her primary interest, it appears to me. The questions she asks take a completely different route than the rest of the world. (By the inane annotation ‘the rest of the world’, I’m referring to the community of the philosophers writing about these topics.) The major part of the literature is based on some accepted (though maybe silently accepted) assumptions, which make up the starting point, or

basis of the discussion. What I am thinking of here is that in the literature discussing mental causation one will mostly see that the starting point, and precisely what we have a hard time fitting the human mind into, is particle physics and the causal interactions between these entities (as expressed by the thesis of causal completeness of physics). (See e.g., Kim 2000; Papineau 2004) Most of the philosophers discussing the problem of mental causation strive to understand the mind's relation to physics where the common understanding of 'physics' is the domain of the lowest level constituted by fundamental particles. Cartwright does it differently. When she carries out her discussions and advances her arguments she does so by assuming commonsense physical objects, as in the case of the floating dollar bill. Her starting point is with these objects rather than particle physics. If your starting point is with particle physics it seems hard to refute the larger commonsensical objects that Cartwright starts of with, and also, one might argue, the entities invoked in psychology, sociology and economics. I will come back to this; in the final section I'll take up the issue concerning the question of which side of the physicalist/non-physicalist debate we should consent to. I will focus on the foundation, or starting point, of one's argumentation, and this will affirm the contrast between physicalism and pluralism. Finally, in the light of this, I will offer an argument for pluralism. But first let me turn to John Dupré and his book *The Disorder of Things*.

3. Dupré's Ontological Pluralism

3.1 Introduction

There is a widespread conception among philosophers of mind in contemporary discussions that some form of physicalism must be true. A general form of reasoning goes, I believe, like this: dualism is unacceptable, therefore physicalism. The Cartesian legacy is conspicuous in contemporary discussions in the philosophy of mind; in other words, we were left to deal with an unacceptable dualistic worldview. My opinion on this matter is that it is a misconception that physicalism is the only game in town, as in opposition to the Cartesian substance dualism. I accept the assumption that a *substance monistic* ontology must be true, but this, by itself, does not entail physicalism. As should be clear by now, I believe that there is a third picture that deserves our attention: a pluralistic ontology compatible with substance monism. In his book *The Disorder of Things* (1995), Dupré portrays a metaphysics that stands in clear opposition to the physicalism dominating contemporary discussions in philosophy of mind. Here he presents his metaphysical theory of *ontological pluralism*.

The book is targeted at the idea of a unity of science. The most obvious ontology that does satisfy such a project, and as noted above, the prevailing position in contemporary discussions in philosophy of mind is physicalism. *The Disorder of Things* is divided into four main chapters where he discusses issues concerning natural kinds and essentialism, reductionism, deterministic and probabilistic causation, and finally his chapter entitled *Some Consequences of Disorder*. There are three doctrines of current interest that is systematically attacked in Dupré's book: (natural kinds and) essentialism, reductionism, and also physicalism. The book is rich with arguments and I cannot hope to cover half of them here. What I will do, however, is to sketch the general outline of his metaphysics and present some the

arguments in favour of the ontology in question.¹⁰

Dupré is sceptical to the idea of a unified science because it fails on so many levels. The currently prevailing ontology (physicalism) is simply not something the natural sciences imply. His claim is that the metaphysics he offers us is in much greater tune with what science tells us about nature. Let us turn to the positive upshot of his discussion. The doctrine he advocates, which I simply label ‘ontological pluralism’, can be summarised in two main claims.

[P]luralism as the claim that there are many equally legitimate ways of dividing the world into kinds (...); and second, in opposition to reductionism, pluralism as the insistence on equal reality and causal efficacy of objects both large and small. (Dupré 1995, p. 6-7)

Before I move on to consider his arguments we need to make certain clarifications. First, we need to see that his ontological pluralism must be understood as a substantive monistic ontology. He does not mean that there are many equally real *substances* out there that constitute the different things in nature. His ontological claim (that there are many equally legitimate ways of dividing the world into kinds) is entirely consistent with substantive monism. In fact, the metaphysics Dupré endorses is more credible together with substance monism. We need to see that the claim that everything is ultimately physical (physicalism) exceeds the claim that the world is made out of one substance. And secondly, we need to acknowledge the realism in his theory.

Nothing I have said, either about scientific kinds or about the kinds of ordinary language, suggests that these kinds are in any sense illusory or unreal. They may typically have vague boundaries, to be sure, but that is a quite different matter. Hence the realism. (p. 36)

¹⁰ The third chapter in *The Disorder of Things* about causation and determinism is not something that I am going to account for here. Though there may be some interesting consequences to be drawn relevant to my overall discussion, I’ve chosen to limit myself to the first parts of his book.

3.2 A Note on the Methodology

In the next section I'll give an account of Dupré's metaphysics, but before that I want to make a comment on the methodology at work in *The Disorder of Things*. What is noteworthy is the role empirical observations – of both how we use (commonsense) language and of science – play. This is something he shares with his former colleague Cartwright. In arguing for his position he makes frequent use of examples from science that provides him with empirical support for his thesis. The book is filled with detailed examples and discussions from the different sciences. However, what he does differently than many others in the last fifty years or so is that he turns to biology for support rather than physics when he discusses metaphysics (ontology). And that, I must say, strikes me as an absolutely right thing to do. My initial problem – the problem of mental causation – concerns human rationality (and more generally the human mind), and it should be entirely appropriate to consider biology, rather than physics, if our problem is to understand and explain *subjectivity*, *experientiality*, *morality*, *rationality*, *intentionality* and *content* (linguistic meaning; semantic) and their relation to the natural world. Keeping the discussion as brief as possible I would like to indicate what an argument for this statement may look like.

The argument has an inductive form. Let us state that many problems that earlier have been viewed as mysteries concerning us humans (and the human psyche) have, in fact, on a later point in history been explained in the field of biology. To highlight just two examples of this are the theory of evolution, which explains where we come from; and genetics, which explains how and why children share so many personality traits with their parents. Since biology may be viewed as *the* scientific branch to explain human beings as a natural being, we are, it appears to me, justified in expecting validity in examples from this field in relation to prevailing problems concerning the human mind. Having shown biology's clear importance to the argument I will refrain from further elaboration. What I have said here illustrates my motivation of taking biology serious in discussions about ontology.

3.3 Promiscuous Realism

There is a certain observation which Dupré draws our attention to that is crucial to his view: when we are classifying things in the world, we always do this within a context. A question, such as ‘what kind of thing is this object?’ can only be answered “in relation to some specification to the goal underlying the intent to classify the object.” (p. 5) Every classification of things (as *this* or *that* kind of object) is guided by the goal of a particular investigation. And ultimately, this teleological feature (which appears just as much in science as in common sense) is what determines how we divide the world into different *kinds* of things (objects). This does not imply that the different kinds we classify things into, are unreal or ‘merely descriptions’: they are determined by how the things are. But, importantly, which features we so to say ‘pick out’ is determined by the goal underlying the particular investigation. Again, this does not, in any way, imply that the kinds (in which we classify things into) are fabricated. Hence realism.

In opposition to conventionalism he is quite happy to recognise the fact that properties are something shared by objects, but what he denies is that these are intrinsic properties. This assertion is explained by his distinctions between the stronger and weaker understanding of natural kinds. He says: “there is no reason why the term *natural kind* should be wedded to essentialism....” (p. 83) Strong natural kind is the doctrine that natural kinds share a common essence. (p. 63) Given this definition of strong natural kinds, he puts forth a view on natural kinds that implies that the properties must be intrinsic to the members of a kind. Or in other words, a natural kind’s essence is a set of intrinsic properties instantiated by a member of that kind. The weaker reading, the view that natural kinds indeed share properties but these properties depends on the thing’s relation and/or context, is in fact what Dupré endorses. This does not imply anti-realism, hence his insistence on the naturalism and realism of natural kinds. His view of properties as contextual will be elucidated in the next few pages.

In arguing that *there are many equally legitimate ways of dividing the world into kinds or things*, Dupré accounts for many interesting facts in biological practice. The question he occupies himself with in chapter one in *The Disorder of Things* is how are we to determine what kind of things an object belongs to in the natural world. This discussion concerns the problem whether or not there exist such things as *natural kinds*. That is, does it exist actual groupings of things into different kinds that are *natural*, i.e. not man-made? This leads us back to the question concerning realism vs. anti-realism. Dupré's ontological pluralism, as we've seen, is properly understood realism (what he calls 'promiscuous realism'). Let me account for his argument for the pluralistic feature existing in both commonsense language and in science.

Crucial to Dupré's metaphysics is the observation that the ontology he endorses is reflected, and therefore supported, by both commonsense and scientific language. The claim is that there are countless ways of taxonomising the world into different kinds and this is reflected by the classificatory practices within the context of both commonsense and the different sciences. And further, his 'promiscuous realism' also insists that the different ways of dividing the world into kinds are often done in many different crosscutting ways. Let me bring forth Dupré's own examples (pp. 28-29; 34) to illustrate this. For example, in commonsense language the term 'lily' is typically meant to refer to a certain kind of flower. However, in biological classification the genus Liliaceae (or simply 'the lily family') comprises over 120 species including onions and garlic. And further, a chef has a clear distinction between an onion and garlic even if such a distinction is not reflected in scientific taxonomy. A farmer and a hunter are in no doubt whether that furry, long eared, jumping animal is a hare or a rabbit even if the physiological differences are minimal. In short, we make different types of crosscutting distinctions that are useful for us when making sense of the world. In commonsense language sharp distinctions exist between two things (as in the case between onions and garlic; between a hare and a rabbit) that are not reflected in science. The next question one might want to ask is whether this messiness in ordinary language is something we can overcome if we turn to the natural sciences. In science, might we expect a more unified model for classifying all the things into

different kinds – one unified method used in determining what kinds there are? The answer, as I've insinuated, is a resounding 'no' according to Dupré. What Dupré does is that he accounts for the different ways things are classified as different kinds (species) in biology. "[T]he situation when we attempt to assign organisms to species is quite as messy as that revealed for the case of nonscientific classification." (p. 37) This messiness is illustrated with the question concerning the nature and status of species.

First, there is a major disagreement about the very ontological category to which species belong: are they kinds, sets, individuals, or what? Second, there are a number of very different accounts extant of what constitutes membership of a species; most fundamentally, these debates concern whether the members of species are connected by evolutionary relation or by the common possession of morphological or physiological features. Third, a very traditional issue is whether there is some essential property defining membership of a species. (p. 38)

These observations are supposed to illustrate that there is, as a matter of fact, an open debate regarding how to classify species. So if we expect that we can turn to scientific practice to get the answer to our question, we are wrong. That is to say, we will not get a uniform answer. What Dupré wants to establish here is that there is nothing 'out there' in support of the claim that there is one ultimately right way of dividing and classifying the things in the world into kinds – of 'carving nature at the joints'.

3.4 Essentialism

A further issue Dupré brings forth in the first chapter of *The Disorder of Things*, and as I've briefly mentioned at the beginning of the previous section, is the problem of essentialism: do objects exhibit certain essential properties such that the properties determine membership of a specific kind (e.g. species)? Accordingly, essentialism is the view that for any specific kind of entity, there exists a set of properties of which every entity must possess in order to be characterised as *that* kind; a kind's essence is a set of properties whose possession is a necessary and sufficient condition for a

particular individual in order to belong to that kind.

Dupré offers us three main arguments against essentialism. The first argument is an epistemological argument. Let's call this *the epistemological argument against essentialism*. It is stated as the following. “[E]ven if a kind *is* determined by a real essence, the *discovery* of such an essence presupposes the discovery of the kind.” (p. 63) What he is aiming at here is that if we insist that a natural kind is determined by its (set of) essential properties, it seems like these properties can only be found (hence stated) if we know where to look, that is if we already have identified the kind. The only way to come around this is to claim that the examination of one particular individual is sufficient in order to determine to what kind it belongs. This seems highly unlikely, and as Dupré points out: “Only the most extreme reductionist could suppose that examining a particular individual would allow one to determine to what kind it belonged apart for the prior recognition and at least partial characterization of that kind.” (p. 63) Surely, it is through observations of many individuals that allow us to classify them as the same kind. When we are to determine the kind's essential properties we *must* presuppose discovery of the kind. That is to say, the only possible way to discover such essential properties is to know what kinds the objects (entities) belong to. “The conclusion is that discovering kinds does not involve discovering essences; and so, given that there is no other way of discovering them, nothing does.” (p. 64)

There is one objection to this argument that I want to address. And, in my opinion, it is an important one. It is important because it allows us to appreciate both the argument's strength and its weakness. The objection I want to clarify does not show that anti-essentialism is false, but the complaint is that the desired conclusion (Dupré's desired conclusion, that is) is not something that follows from the argument itself. The argument is supposed to show that essentialism (the view that objects have a set of essential properties such that this set determines membership of a kind) is false. However, there is gap that is left unfulfilled. It is a jump, which Dupré seems to think is legitimate, from epistemology to ontology. The argument, in short, is that the

discovering of the kinds does not involve discovering essences. Even if we take the premises to be sound it does not follow that essences do not exist. All he has shown is that the essence cannot be *discovered* prior to the discovery of the kind. The essentialist might say that even if the discovering of the essences is done through the discovering of the kinds, the essences are still real; the essences are nevertheless the properties determining the membership of a specific kind.¹¹ The strength of the argument lays in the insistence of empiricism with regard to our metaphysical theories, and more generally our knowledge about nature. Dupré defends precisely this kind of empiricism. What the argument then illustrates is that we have no empirical ground for postulating essences, and empirical support is what we need. This point is accounted for, and elaborated on, in the third argument (see below).

The second line of argument – I label this *the argument from mutation* – is that the essentialist’s account of kinds construes them as immutable and static. This is in clear conflict with examples from the natural sciences, e.g. the theory of evolution, which delineates them as mutable and dynamic. In the case of water, Dupré explains, it can be created (by burning hydrogen), or destroyed (by electrolysis), and properties of individual water can change (by getting hotter or dirtier). It is also possible that all the water everywhere (if it should happen that water only exists on earth) could become hotter or dirtier. We would not say that the *kind* water has changed, but rather that the bits of water that make it up have changed. (p. 39-40)

Recall what I said about the realism in Dupré’s doctrine, and his distinction between strong and weak natural kinds. It is important to be clear on his position on one thing in particular: “I ... wish to dissent from the thesis that a real essence is *necessary* for a

¹¹ There are, of course, other objections to this argument. One might generate hypothetical examples where we discover essences (e.g., a chemical composition, which, after all, is the best candidate of essences) prior to discovering a kind. Imagine for instance someone discovering a (new) kind, and that this is done by looking at the structure of an object’s surface. We might categorize two objects as the same kind because both are shiny and yellowish. Let’s say, however, that when investigating the two lumps more carefully we discover that they have different chemical compositions. We will thereby adjust our categorical schema and say that these two objects belong to two different kinds. Would it not be reasonable to say that the discovery of the second kind is done through the discovery of its essence?

natural kind.” (p. 63) This, as we have seen, is what he labels a ‘strong natural kind’. There is a significant difference between this claim and the view that individuals belonging to the same kind share properties; as I’ve noted earlier, he is more than happy to admit that individuals belonging to one kind share properties. Having said this, however, it does not entail a commitment to strong natural kinds.

The identification of a strong natural kind must involve the belief that the behavior of its instances depends, in some important cases, on intrinsic properties of the individual characteristic of members of that kind. But it would be hard to find even the most ignorant racist nowadays prepared to assert that the dispositions to behavior and social interactions of a man raised in, say, rural Zimbabwe would have been just the same if that individual had been brought up in a wealthy Californian suburb. (p. 80)

To understand this argument against essentialism – let me call this one *the argument from empiricism* – we must follow the following line of thought. The essence of a kind, K , can be summarised as a set of properties, say P_1 , P_2 and P_3 . We will thereby get an answer to the question ‘to what kind do the objects that instantiates P_1 , P_2 and P_3 belong to?’. But this is not the only demand. “[E]ssences are also thought of as determining the properties and behavior of objects belonging to the kinds of which they are the essences.” (p. 62) That is to say, something more is required from P_1 , P_2 and P_3 to count as the essence of K : the essence must also provide us with *explanatory power* of the properties and behaviour of members of K . As D. Gene Witmer (2003, p. 186) explains: “The essence of water, it is commonly said, is to have the chemical composition H_2O , and this essential feature provides the explanation of its liquidity, its ability to freeze, evaporate, dissolve other materials, and so on.” Dupré’s claim is that there are scientific categories that lack this sort of explanatory power.

The main force of the argument is a plea for complete empiricism with regard to the explanatory potential of particular kinds. My suggestion is that a commitment to real essences either is vacuous or violates this demand. (...) [W]hat makes a kind explanatory useful is that its instances share the same properties or dispositions and are susceptible to the same force. But since we have no way of deciding how much such concomitance to expect in any particular kind, the

discovery of a kind adds little, if anything, to the discovery of whatever correlations may turn out to characterize it. (...) I take the preceding discussion to illustrate this point in the following way: it is easy enough to distinguish classes at many different levels of generality – males, male vertebrates, men Irishmen, and so on – but there is nothing in this process of differentiating classes that provides any basis for predicting the extent to which its members will be amenable to lawlike generalizations. (Dupré 1995, p. 80-81)

With this plea for empiricism Dupré argues against essentialism. The latter argument can be summarised in the following way: whether or not an explanation exists is not to be settled *a priori*. And, further, “there are many scientifically useful kinds for which there is no comprehensive explainer...” (Witmer 2003, p. 188) So, what we have here is the three arguments against essentialism. The epistemological argument, as we have seen, is indeed possible to respond to, and, so it *may* be viewed as the weakest argument. The last argument – the argument from empiricism – depends on whether or not one agrees with Dupré’s empiricism. The opponents of this line of thought are those philosophers who, in general, endorse conceptual analysis. This leads us to the argument from mutation. A standard interpretation says that a denial of this implies that one would advocate a pre-Darwinian worldview: a denial of the theory of evolution.¹²

It is worth noting that this argument is (mainly) targeted at essentialism with respect to species. One possible way of responding is to say that it is not at all clear how conclusive this argument is towards essentialism with respect to microscopic kinds, such as water’s essence being H²O; gold’s essence being the element with atomic number 79; and so on and so forth. I do not want to elaborate any further on this however and the reason for this is simple: I am not sure if we need to show that essentialism is false in order to object to reductionism and physicalism. You do not have to agree with Dupré in that reductive physicalism requires, or rests on, essentialism. What I want to do is to suggest, in a broad outline, a way of

¹² See Okasha’s paper *Darwinian Metaphysics: Species And The Question Of Essentialism* (2002) for a discussion about the incompatibility of biological essentialism with modern Darwinian theory.

strengthening Dupré's metaphysics, in such a way that does not require a denial of essentialism. My question is this: is ontological pluralism bound to a denial of essentialism? And the answer to this, as it appears to me, is negative. One of the arguments Dupré advances against reductionism is this: reductionism requires essentialism, and essentialism is false. There are, I maintain, stronger and more feasible ways of denying reductive physicalism – more credible objections to physicalism as in contrast to the reasoning Dupré displays. My point, at its simplest, is this: it does not matter if you either endorse or deny essentialism: ontological pluralism is still feasible on the basis of a neutral attitude towards essentialism.

3.5 Physicalism and Reductionism

3.5.1 Introduction

So far I have not tried to spell out a precise and sufficient formulation of physicalism and it is this which I shall turn to now. Tim Crane (1991) suggests that we should understand physicalism as the thesis that all God had to do to create the world we live in was to create all the elementary particles and all the laws governing them; the rest followed from these two acts. The problem with this formulation is that it does not really say that much. Consider the formulation counterfactually. All we are saying, when we say that if we remove all the physical stuff there would be nothing left, is that if we removed all the elementary particles (and the laws governing them) we would somehow also take away all the other things too. (Dupré 1995, 91-2) That is to say, in accepting the formulation proposed by Crane we have not shown that mental, biological, economical or sociological entities *are* physical entities (in a sense that is required of a *monistic* ontology). What we have pointed out is that these entities – *somehow or another* – also would disappear if we removed the physical stuff. It does not follow that all the dubious entities are only the physical entities of which they are composed. This formulation mirrors how I believe many philosophers think. “[The denial of the existence of mental substance, God, ghosts, after life, or whatever, does] not require any strong positive thesis of monism.” (p. 92) Or to put it another way, these denials of existence does not entail physicalism unless you add the assumption

that physicalism is the only option beside dualism. This is what I read to be a delusion. There are other alternatives in opposition to dualism than physicalism. Ontological pluralism deserves our attention.

Dupré considers another formulation, which he labels ‘compositional materialism’. It is stated as follows: “whatever kinds of things there may be, they are all made of physical entities.” (p. 92) He points out that this is not a trivial formulation because it denies Cartesian dualism, Gods and ghosts, but the difficulty with this is that it excludes a lot of things whose existence seems to be undeniable. His examples are of political systems, the rules of chess, and irrational numbers. These he says, do not appear to be made out of anything at all. (Ibid.) This line of formulation, however, does not pose a treat to the pluralism Dupré has in mind. This is because the formulation does not say anything that gives ontological primacy to those things that make up other things; nor does it give preeminent metaphysical or scientific importance to what things are made of. (Ibid.) Dupré formulates the objection in an Aristotelian vocabulary: “why should we emphasize matter so strongly to the exclusion of form?” (Pp. 92-3)

A third formulation, and the second version of materialism, labelled ‘reductive materialism’, evokes a much bolder metaphysics. Dupré formulates it in epistemological terms. “[E]verything that happens can be explained...in principle, in terms of physical entities and the laws that govern their behavior.” (p. 93) In an ontological vocabulary the proposal is that the physical entities (particles, processes, properties and functions) together with the laws governing the behaviour of the physical entities *cause* everything that happens.¹³ This formulation is exactly what we need if we want to rule our pluralism. If we combine these two ideas, what we have is a thesis which claims that every biological phenomena, economical phenomena,

¹³ This is almost, though not exactly, what the thesis of causal completeness says. The CCP say that every *physical* occurrence has a sufficient physical cause. The claim above, on the other hand, is that *every occurrence* (i.e., either it is physical, biological, psychological, economical, sociological or whatever) has a sufficient physical cause.

psychological phenomena, sociological phenomena, and so on, are all caused by, and ultimately explainable, in terms of physical entities and the laws governing their behaviour. Let me rephrase these two formulations. The first is what Dupré labels ‘reductive materialism’. I will call it ‘epistemological reductive physicalism’, or ‘ERP’ for short. Let us call the second ‘ontological reductive physicalism’ or ‘ORP’ for short.

(ERP) Everything that happens can (in principle) be *explained* in terms of physical entities and the laws that govern their behaviour.

(ORP) Physical entities and the laws that govern their behaviour *cause* everything that happens.

The step from the first version of physicalism (compositional materialism) to the second version, as formulated above, accordingly, entails that one endorses reductionism. If we accept Dupré’s formulation we need a strong form of *epistemological* reductionism: the biological theories (with its laws) explaining biological phenomena must be reduced (or *reducible*) to physical theories (and laws); the psychological theories need to be reduced (or *reducible*) to physical theories; and so on. And further, the different higher-level laws (e.g., at the level of social groups) need to be reduced (or *reducible*) to the fundamental physical laws. The general idea is that a higher-level theory with laws, T_B , is reduced to, or *by*, a lower-level theory with laws, T_A , if all the laws in T_B can be logically derived from T_A . If we favour the ontological formulation, on the other hand, we need an *ontological* reduction: the biological properties (entities, processes or functions) must be reducible to physical properties (entities, processes or functions). Note that one might endorse ontological reductive physicalism and deny epistemological reductive physicalism. Davidson is famous for a version of this. If we favour Dupré’s formulation (ERP), however, it is most feasible to assume ontological reductive physicalism. Let us state this latter version of physicalism as follows:

(Reductive physicalism) Physical entities and the laws governing their behaviour causes everything that happens; and everything that happens can (in principle) be explained in terms of these entities and the laws governing their behaviour.

3.5.2 The Arguments

On pages 99-102 Dupré presents an argument for reductionism that basically is the same as the Causal Exclusion argument. The crucial premise is the CCP. Dupré considers how an assumption about causality, namely the CCP, entails reductionism, and he notes that this assumption “can equally well serve as an argument from the falsity of reductionism to the falsity of the view of causality in question.” (p. 99) Dupré then offers us a line of argument against reductionism and the thesis of causal completeness of physics that involve an inversion of the reductionist *modus ponens* (that causal completeness requires reductionism) into the antireductionist *modus tollens* (that the failure of reductionism implies the falsity of causal completeness).

In part II of his book (especially pp. 107-145) Dupré launches a discussion about reduction in biology. What he aims to show, in short, is that the reductionist programme fails in biology. He considers ecology (“the study of the determinants of the abundance, or relative abundance, of particular kinds of organisms” [p. 108] as he puts it) and genetics in his discussion. Since I am no biologist, I do not pretend to be in any position to evaluate Dupré’s examples in any thorough way. Therefore, once more what I will do is to simply state the fact that the reductionist programme has many critics. What Dupré points to is cases in biology where we have certain (higher-level) theories, which fail to be reduced to lower-level theories (e.g., that classical transmission genetics is irreducible to molecular genetics).

To put it at its simplest, the general failure of reductionism may be attributed to the following fact: the individuals that would have to be assumed for the derivation of the macrotheory cannot be identified with those that are the subject of descriptive accounts at the next-lower level, although their relationship may be close enough to allow such derivations to serve important explanatory purposes. The

possibility of this nonidentity is to be explained by the fact that the individuals at both levels are idealizations. Both models at the macrolevel and descriptive accounts or laws at the microlevel involve abstractions. But the abstractions involved are not the same. In relation to my argument in Part I, this point can be seen as establishing the possibility of autonomy for higher-level natural kinds. (p. 116)

I also would like to mention Noble again here. Recall that what he aims to show is that there are emergent properties appearing at the level of a biological system (e.g. a cell or an organ) with fundamental explanatory roles with respect to the behaviour of the system's component parts, not possible to reduce to these underlying components. (Noble 2008, chap. 4)

There is an objection to Dupré's argument (that the failure of reductionism implies the falsity of causal completeness) proposed by Sandra Mitchell (2003) that I want to briefly address. The problem with Dupré's argument, as she sees it, is that when he argues for the failure of reduction in biology he does not show that reductionism fails *in principle* (which is, it seems to me, exactly what Noble aims for), but rather that reduction is unavailable *in fact* in these cases that he is considering. Recall that the principle of CCP claims that every physical effect (that has a sufficient cause) has a sufficient physical cause, and from this it does not follow that we are in a position to *in fact* explain every physical event in terms of prior physical histories, only that it would be possible *in principle*. So if the modus tollens reasoning where to go carry through, Dupré need to show that reduction in biology and psychology fails *in principle*. Mitchell notes that "[i]t is the ... stronger claim that is needed to overturn causal completeness, for it is *in principle* reduction that figures as the conclusion of the reductionist argument." (Mitchell 2003, p. 184)

The question that arises, if we are to take Mitchell's objection at face value, is what exactly is needed in order to show that in principle reduction fails? One might claim that Noble's point, if we accept it to be veracious, is sufficient. If we can find causally relevant properties (with fundamentally explanatory roles, that is) at the level

of a biological system that cannot be explained by the component parts alone, we have shown *in principle* reduction to fall short.

Let me summarise. Dupré has a distinct way of understanding (what I simply call) physicalism. The type of physicalism that holds Dupré's interest is the kind expressed above as 'reductive physicalism' (you can prefer the epistemological formulation or the ontological one). There is another version of physicalism, however, that is fairly innocuous. If by 'physicalism' you simply mean what Dupré labels 'compositional materialism', what we have is a relatively modest statement about the world, which poses no threat to the pluralism Dupré has in mind.¹⁴ What we need in order to rule out this ontological pluralism is something much bolder: we need reductive physicalism – an ontology which presumes the CCP-thesis to be true. It is only by assuming that the physical domain is causally complete that one might hope to arrive at the version of physicalism that is interesting. Dupré then argues against this metaphysical thesis the following way: causal completeness of the physical domain (CCP) requires reductionism, and the failure of reductionism implies the falsity of the CCP, hence the falsity of physicalism.

¹⁴ I want to refer to Barry Loewer's article *From Physics to Physicalism* (2001) for a thoroughgoing discussion concerning the question of a sufficient formulation of physicalism. In this paper Loewer discusses how we should understand physicalism and what does *not* follow from such a formulation. Noteworthy is that, given what he considers to be a sufficient definition, Loewer argues that reductionism and eliminativism do not follow. An immediate reaction to this would be to say that the formulation Loewer proposes does not rule out the ontological pluralism that is of current interest. Although I find Loewer's paper interesting and worth reviewing I do not have room for further elaboration and will say no more about it here.

4. Conclusion

4.1 Summing Up

In the beginning of this dissertation I started out by sketching the problem of mental causation. This is a problem that is subordinate to the general problem of the relation between the mind and the body. Many, including me, seem to think of mind/body causation as the biggest puzzle and the main problem we need to solve (or dissolve) in understanding the mind and its place in the natural world. Although some aspects of the metaphysical theories I have discussed here indicate how an answer to the problem of mental causation could look like, I have neither tried to give an answer to the mind-body problem in general nor to the problem of mental causation. That has not been my aim. What I have done, rather, is that I have started off by focusing on the metaphysical theory dominating contemporary discussions on this matter. I have stated the argument that, in my opinion, is *the* most powerful argument in favour of physicalism. My discussion has mainly revolved around one of the three constituting premises. What I've done, accordingly, is that I've carried out a discussion of this clinching premise in an argument in favour of a metaphysical position that may have the capacity of formulating an answer to the mind/body problem (and mind/body causation).

It is beyond doubt that many philosophers take the principle of causal completeness for granted. It is so intuitive that it is tempting to think of it as undisputable. What I have done is to question this principle. I've done this in two different ways. First, I have presented Papineau's argument for the CCP and I then criticised it. My aim has been to show that the argument is incomplete. There are certain assumptions that need to be settled if we regard Papineau's reasoning as the most preferable. Most striking is the assumption made regarding the question of what should be regarded as something physical. I have pointed out how this easily might lead to a circular mode of reasoning. Papineau's argument is targeted at an exaggerated dualism that is of little interest. I share the opinion that the dualism we have inherited is unacceptable; what I do not believe however is that physicalism is the only serious alternative. It

seems to me that the argument advanced by Papineau is an argument against dualism, rather than for the CCP. The only way the argument would go through, without further arguments or premises, is to assume that physicalism is the only serious alternative to dualism.

In part two and three I have focused on an alternative to physicalism. I have sketched an ontology, as presented by Cartwright and Dupré, that stands in clear opposition to the physicalism that dominates contemporary discussion about the mind's nature. My aim has been to sketch out ontological pluralism in its general form. This has led me to the second approach of a denial of the CCP. Cartwright's portrayal of nature and her arguments for it does not only show that science (and commonsense) is *leaving room for* denying the CCP, it also provides us with *reasons to* doubt it. Or so she argues.

Another one of my goals has been to show that the metaphysical portrayal of nature called ontological pluralism is, indeed, in great tune with science. I thereby distance myself from Putnam's claim that physicalism (or materialism as he prefers to call it) is to be regarded as 'the scientific metaphysics'. "The appeal of materialism lies precisely in this, in its claim to be *natural* metaphysics, metaphysics within the bounds of science." (Putnam 1982, p. 147)

[A] good deal of our knowledge...is not of laws but on natures. These tell us what *can* happen, not what will happen, and the step from possibility to actuality is a hypothesis to be tested or a bet to be hedged, not a conclusion to be credited because of its scientific lineage. The point is that the claims to knowledge we can defend by our impressive scientific successes do not argue for a unified world of universal order, but rather for a dappled world of mottled objects. (Cartwright 1999, p. 10)

Of course, the following question remains: *how are mental properties causing changes at the lowest level?* In answering this question I think the wisest thing is to await future science for the answer. There surly is also a lot philosophical work to be

done, especially in the field of philosophy of action. But the problem is not to be solved by philosophers alone. How could it?

4.2 Balancing Pluralism and Physicalism

In this final section I want to say something about Cartwright's and Dupré's metaphysical considerations and compare them to the metaphysics dominating contemporary discussions about mind and nature. Specifically, I will flesh out how I believe many physicalist conclusions come about in comparison to the pluralistic ontology in question. Moreover, I aim to say something about how philosophers conduct metaphysics. My claim, generally, is that the two opposites start off with certain assumptions (as one always will have to do) that differ remarkably and from these arise arguments that yield radically different conclusions. In my discussion I have focused on one of those assumptions, namely the causal completeness of the physical domain. This is an assumption about causation that is deeply rooted in philosophers' way of thinking the last fifty years or so. There are, I believe, certain intuitions about nature that motivates this belief. The intuitions, more specifically, are that nature is a fundamentally elegant thing characterised by order, unity and simplicity. These intuitions are demonstrated by the physicists' drive for the discovery of a theory of everything. Both Dupré and Cartwright dispute the portrayal of nature as elegant and ordered. Cartwright claims that the available empirical evidence suggests a picture of nature as rather messy. Recall Cartwright's point (quoted earlier) that if we look at our knowledge of nature we will see that it is highly compartmentalised: divided into separate branches. And she asks, "Why think nature itself is unified?" (Cartwright 1983, p. 13) Quantum mechanics is another example of science providing us with reason to dispute the characterisation of nature as well-ordered and simple.

"...I want to consider what image of the material world is most consistent with our experience of it, including our impressive successes at understanding, predicting and manipulating it..." (Cartwright 1999, p. 9)

Let me start with a brief survey of Cartwright and Dupré. Like Aristotle, Cartwright starts off with a pluralistic ontology. Medium sized dry objects, such as chairs, tables, rocks, balloons, cars, coins, marbles, and what have you, are what Cartwright takes at face value. Cartwright's interest is in explaining what happens to these kinds of objects. By presuming these kinds of things we can see what serves as the foundation for her metaphysical considerations. What she is finally going to end up with is a pluralistic view on causation. All her arguments can be seen as the attempt to establish the validity of the step from a pluralistic *ontology* to pluralism in *causation*. In the history of philosophy we see great resistance against using this pluralistic ontology as one's starting point. We are not justified in this starting point, the objection goes; rather, we should dive into the micro world of the fundamental building blocks and see where it goes from there. The idea is that we should resist taking the objects suggested by commonsense (or more generally psychological) experience at face value.

Dupré takes a slightly different approach. He bases his discussion on the empirical fact that there are many different kinds of scientific (and commonsensical) explanations. Recall the Aristotelian view that Dupré advocates: every classification of the things in the world is guided by (partly determined by, I would say) the underlying goal of the particular investigations. The result is an *explanatory pluralism* that serves as Dupré's starting point. His arguments, accordingly, can be viewed as the attempt to establish the validity of the step from *explanatory* pluralism to *ontological* pluralism.

It is no surprise that Dupré's ontology and Cartwright's view on causation coincide neatly. If we take Dupré's argument to be sound we are left with an ontological pluralism. This ontology, in turn, can thereof be viewed as a well-founded starting point for Cartwright. If the arguments offered by Cartwright are considered to be sound, we are left with a denial of doctrine of causal completeness of the physical domain. I want to restate a quote from earlier to account for the contrasting portrayal

of nature that Cartwright asserts, which she calls ‘metaphysical nomological pluralism’. [It] is the doctrine that nature is governed in different domains by different systems of laws not necessarily related to each other in any systematic or uniform way; by a patchwork of laws.” (Cartwright 1999, p. 31)

Most of the other contemporary philosophers involving themselves with philosophy of mind (what I earlier referred to as ‘the rest of the world’) have an approach that differs radically. I have noted earlier that their starting point is to understand mental causation in relation to particle physics and the causal interaction between these fundamental building blocks. What is notable is that this starting point consists in an assumption of causal monism. I.e., causation is something that holds true among entities at the lowest level. The Causal Exclusion argument illustrates the attempt to establish explanatory and/or ontological monism. The step, thereof, is from *causal* monism to *explanatory* and/or *ontological* monism. It is striking how many philosophers participating in the debate about mind and physicalism that use this monistic understanding of causation as their starting point. This particular assumption about causation is often taken as a fundamental metaphysical truth; this, I venture to claim, is the central core of the physicalism they promote. No wonder they have a hard time fitting the mind into their metaphysical portrayal of reality. Again, these physicalists’ arguments can be viewed as the attempt to fill in the gap between monistic *causation* on the one hand and *ontological*, and ultimately *explanatory*, monism on the other. The discussion is seldom targeted at the physicalists’ central idea – the causal completeness of physics. The idea is that causation is something that holds true between elementary physical particles; this is what causation ‘really is’. Every other phenomena we describe and pose explanations for, of which we employ causal terms (e.g. when use of words like ‘because’) is either to be reduced to the lowest level (presumably through the several intermediate levels), or it is only ‘a matter of speaking’, or to put it in a more appealing way: ‘only description’. I’d like to mention Davidson again at this point. He operated with such an understanding of causation and explanation. He understands causation as something that requires strict exceptionless laws and this is what relates events together. An event may be

described in different ways; and this choice of vocabulary determines if an event is to be characterised as a physical or mental one. An event may be described in two (or more?) different ways (by using different kinds of vocabularies, that is), but it is, however, a case of token-identity.

In the literature one will see a reoccurring unwillingness to question the CCP; this monistic assumption about causation is to a big extent accepted as an unquestionable truth. It is not *that* premise that is subject to a denial in the Causal Exclusion argument. Rather, it must be a subtle defect in either the first premise (the causal efficaciousness of the mental) or of the last one about overdetermination.

What is noteworthy concerning the metaphysical considerations preformed by Dupré and Cartwright is their insistence for *empirical support* when it comes to forming a metaphysical picture of reality. For Cartwright and Dupré, however, the notion of ‘empirical support’ has a specific meaning; the concept is semantically conditioned. The opponents will have a different understanding of what it is for a (metaphysical) theory to have empirical support. In short, I believe that the various conceptions of these words are conditioned by the different foundation with which one starts. The point is illustrated by the following idea: different frameworks shape different conceptions. Cartwright’s starting point and her claim for it to be empirically supported, is indeed disputed. The objection is that we should not consent to the objects suggested by commonsense experience.¹⁵ Our ontology should rather be rooted in science, and what is more reliable than the natural sciences and ultimately physics? If our question is ‘what kind of things are there?’ we ought to turn to particle physics for our answer, at least as a first approximation. The best way to do metaphysics is to start off with the objects suggested by particle physics (together with the concepts and laws used there) when forming a metaphysical theory of ontology. So, we can see the difference does not lie in their claim for the metaphysics

¹⁵ One line of objection can lead onto problems regarding vagueness, which is a much-debated issue. I, however, will not go further into this.

to be empirically supported or not, but rather what should count as empirical support. The physicalists promote the view that the larger object's compositional parts, as confirmed by particle physics, have ontological primacy over the larger object itself. The medium sized objects are too fuzzy and vague to be taken at face value. Cartwright and Dupré, however, think that the preeminent importance given to particle physics is unjustified. We ought to take the explanatory models used by the other sciences into account as well. The reasoning preformed by Cartwright and Dupré, as we've seen, goes roughly like this: if the goal is to shape a metaphysical theory that resembles reality what could be more appropriate than to turn to science, or more generally, to our experience of it? Here we can see that Cartwright and Dupré do not allow particle physics to be superior or preeminent over the other sciences. Dupré finds support in biology and Cartwright mostly in economy and physics (the latter by an endorsement to middle sized dry objects). And further, they consider commonsense experience together with, or I should say *backed up by*, the body of all the different kinds of scientific explanations as a crucial guide to see what nature is really like. Following this through, what the metaphysician ought to do, and what both Dupré and Cartwright aim for, is to be well informed about up-to-date scientific research, methods and explanatory practices. They start off with an account of how we experience reality and how nature is represented by science (or by the sciences, we should say). Given that a metaphysical theory is meant to depict *reality* we'd better not neglect the empirical knowledge we have gained from it, including the fields of chemistry, biology, psychology, sociology and economy (among others). The lesson to be learned is that our experience of reality (including the sciences' representation of it) is, after all, our best guide to see what the world is like.

Following this thought, it may be argued that Dupré and Cartwright have the advantage of enjoying the virtue of being well informed by up-to-date scientific methods and explanatory practice. But as we've seen, however, this idea – that we ought to be well informed by science – is not something the physicalists oppose. The disagreement is rather about what should count as legitimate empirical support. The fact that there is a plurality of different kinds of scientific explanations,

representations and so on, and that commonsense language depicts reality as pluralistic, does not provide us with reasons to endorse ontological pluralism, the objection goes. They are not justified in their starting point. The things they presume to be true are indeed commonsensical, but that does not make them true. The response to this objection, on behalf of the pluralists, should now be obvious. The foundations that Cartwright and Dupré pose are *more* justified than the physicalists'. Unlike the pluralists', the assumption about causation that the physicalists propose are controversial in the sense that the claim is in lack of empirical support. The plurality of scientific explanations and representations, and the pluralistic ontology captured by commonsense experience is undeniable. Cartwright and Dupré argue for taking the step from this over to metaphysical pluralism and pluralism in causation. In their defence, the claim is that their starting point is not in lack of empirical support the same way the assumption about causal completeness is.

In short, the disagreement is about what qualifies as 'empirical support'. Cartwright and Dupré take the total body of scientific practice (that is, not only physics, but also biology, psychology, sociology and economy) into account and argue that the medium sized objects described by commonsense – the entities of which we predict and explain – should be taken at face value. If we do this, we'll have a scientifically founded metaphysics. The physicalists, on the other hand, will not admit these kinds of objects to be justified ontological entities, simply because these entities are not suggested by science. The desired exactness is found in the science of the lowest level and this is where our metaphysical portrayal should be rooted. If this is done, the reasoning goes, we'll have a 'scientific metaphysics'.

In the absence of a neutral ground for evaluating and balancing these two starting points up against each the following question arises: is it a matter of pick and choose which side you approve? In one sense I believe this to be the case. But then we must ask ourselves if there is anything apart from the very different starting points that would allow us to judge one or the other as more entitled or justified; something that provides us with reasons for judging which is better. In other words, perhaps the

theory's fruitfulness outside its own domain can help to determine how far the interest for one or the other should go.

Let me finally draw your attention back to the philosophy of mind. The problem is how to understand the mind and its features in relation to the natural world. As we have seen, the physicalists have an exclusion problem regarding the mind. My view is that this problem is due to the specific assumption about causality. The insistent worry is that there is no room for the mind to do any causal work in the world. This is the main problem for physicalism. The pluralists, on the other hand, do not have that kind of problem. A brand new world opens once you notice that the CCP is disputable. Suddenly there is no difficulty finding room for minds in the natural world, because the alternative picture is of a world consisting of many different kinds of things, including minds. And further, this is a world governed by a patchwork of laws; there is causation from below, above and a thousand angles to the side. The last thing I want to do is to suggest that this may be turned into an argument for pluralism. Despite the absence of a neutral ground for evaluating which of the starting points (leading to the two opposites) is more justified, we might use a kind of abductive reasoning: an inference to the best explanation. If our interest is in the philosophy of mind and mental causation, we might ask which of the two ontological portrayals offer us a world picture where minds are not excluded.

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