

# NONREDUCTIVE PHYSICALISM AND MENTAL CAUSATION\*

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## 2.5 A new way to understand overdetermination

I want now to consider what the correct way to understand overdetermination could tell us about the exclusion problem. But what is a better understanding of overdetermination? I think the following example, to be understood as a counterexample to Bennett's test, can lead the way.

Two rocks are thrown and break a window. It is clear that the event is overdetermined; it's a standard case of overdetermination if anything is, and it passes the test; both counterfactuals came out true.

Now, suppose that we interpose, between the place where the rocks were thrown and the original window, a second window with such a resistance to impact, that if the two rocks are thrown they still break the original window (and each has more than the required energy to break the original window independently, that is, each is still *causally sufficient* for the breaking), but if only one is thrown then the original window fails to break. It might be that the breaking of the interposed window makes the momentum of the single rock to change in such a way that when it hits the original window it doesn't have the necessary

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energy for the breaking. It seems to me that this example, while being one of overdetermination, fails Bennett's test. After all, if one of the rocks were thrown without the other, then it would fail to break the window. In such a case, both counterfactuals would be false.

This example depends on a factual matter of this world. But the idea can be expanded to nomological worlds with a different example. Suppose that the world is such that when one elementary particle of kind *z* hits certain types of atoms *A*, it will not make a difference to *A*, but that when 2 or more hit *A* it causes *A* to disintegrate. Moreover suppose that the reason that *A* disintegrates is because of certain impact between *z* and *A*'s core. Now the reason that *z* alone cannot disintegrate *A* is because it cannot pass *A*'s exterior protecting field (two or more *z*-particles are needed). But once inside the field it has the energy to disintegrate *A* on its own. Now this case seems to be another example of overdetermination that does not pass the test. If only one particle hits *A*, *A* will not disintegrate. And this extends to all nomological possible worlds.

Because, in these examples, both counterfactuals come out false, should we think that events *c*<sub>1</sub> and *c*<sub>2</sub> are necessary to cause *e*? Are *c*<sub>1</sub> and *c*<sub>2</sub> partial causes of the effect *e*? That is the reading that Bennett would probably make of this fact, and it seems a plausible one, if we have a view of overdetermination that implies that both of the causes have to be sufficient<sup>1</sup> for the effect *e*. That is a view that is implied in the counterfactual test and is probably universally accepted. Moreover there seems to be some features of this example that might be picked up to argue that this is an example of joint causation.

After all, for the causal chain that begins at *c*<sub>1</sub> to break the original window it needs the help of *c*<sub>2</sub>, and vice versa. And to need help in a causal context is to be part of the circumstances of the cause; *c*<sub>2</sub> has to be one of the circumstances of *c*<sub>1</sub> and vice versa. But as we have seen, when talking of sufficient causes for a certain effect in an overdetermination context the other cause cannot be part of the circumstances of each other. And in this example I want to claim that *c*<sub>2</sub> is not part of the circumstances of *c*<sub>1</sub> and vice versa. So one has to accept that they are not causally sufficient for *e*. (if one focuses on *c*<sub>1</sub> and *c*<sub>2</sub>.)

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<sup>1</sup> As we will see later on, they have to be sufficient, but this needs qualification: they have to be sufficient at the moment of *impact*.

However, I still think that it is clear that the case of the two rocks with interposed window and the case of *z* and *A*, as it happened in the *actual* world is a case of overdetermination. I will go on later to argue that the fact that *c1* and *c2* might not be sufficient causes is not important. So forgetting for now, this difference, does the example fail to pass the test? There are certain ways that are wrong ways to assess counterfactuals, as when we make use of backtracking counterfactuals.

Is this case an example of backtracking? Backtracking happens when one does a reasoning of the following form: “if *c1* had not happened, that must have been because *x* happened, and if *x* had happened, *c2* would have happened in such a way that it would have failed to cause *e*” (Bennett (2003), p. 9 of the online pdf version). To illustrate this point take the following counterfactual situation about a firing squad: “suppose that the first gunman is quite serious about his work, and would only fail to fire his gun if some terribly traumatic event occurred just before he was to do so- the sudden collapse of a beloved commanding officer, for example. But that kind of event would leave the second gunman shaken up as well, and would throw off her aim. Consequently, it looks as though the victim would not have died if the second gunman had fired without the first – the second gunman would have missed.” (Bennett (2003), p.9 of the online pdf version)

Ruling out backtracking is ruling out counterfactual dependence of the past on the present. The sudden collapse of the beloved one is counterfactually dependent on the fact that the first gunman failed to fire his gun. But that just seems wrong in causal contexts; after all the past is fixed and accordingly whatever happens in the present cannot alter it. Moreover the reasoning takes the following form:

$$\text{If } (\sim c1 \square \rightarrow X \text{ and } X \square \rightarrow (c2 \square \rightarrow \sim e)^2) \text{ then } (c2 \& \sim c1) \square \rightarrow \sim e .$$

That is, we go back and forth between the present and past, to find out what would have happened in a certain counterfactual situation that makes reference to the future. But what will happen, and in particular the finding out if a certain effect will occur, should be ascertain by the

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<sup>2</sup> Or instead of  $(c2 \square \rightarrow \sim e)$  it is possible that “*c2* wouldn’t have caused *e*” is better way to express it.

present state of things; it shouldn't depend on a counterfactual that fixes the past depending on certain affairs of the present and then assesses the future based on which facts about the present were changed by the fact that certain aspects of the present fixed the past.

The case of the two rocks with interposing window is quite different. There is no backtracking, since we are not going into the past to inquire why one of the "causes" didn't actually happen. We just assume, rightly, it gone. However, it is clear from this example that the other "cause" doesn't quite make it to cause *e*; it alone when enters into contact with the original window does not have the necessary energy to break it. Moreover the fact that *e* does not happen has nothing to do with facts anterior to any of the causes *c*1 and *c*2, but with the *causal structure of the world*. A similar reasoning applies to the *z* and *A* case.

But are we concentrating on the wrong events? Should the relevant events for the evaluation of the counterfactuals be *d*1 and *d*2, the breaking of the interposing window by *c*1 and *c*2 respectively? It seems to me that the move is unwarranted and unprincipled, but still there is no difference whatsoever in the evaluation of the counterfactuals in such a case. If *d*1 happens without *d*2 it will not break the original window and vice versa for *d*1. And if both of them occur, then the window will be broken with much more causal *oomph* than it's needed.

The only other objection that I notice is to say that *d*1 when it happens without *d*2 is a totally different event because it has considerable less momentum. But this has to depend on a very fragile view of events that I don't share. It seems that when we are looking for the counterpart event *d*1 in a world in which *c*2 does not happened, our relevant event is the breaking of the interposing windows caused by the throwing of the rock *c*1. We are still referring to the same event even if in that world the counterpart of *d*1 has less momentum. It is the same because it is still the breaking of the interposing window by *c*1. (Moreover, it seems that accepting such view of events would make impossible to talk about possible worlds in causal contexts)

There is an objection that needs to be addressed at this point that might have been for a while in the mind of some readers. It is the thought that one cannot get rid of a sense in which each of the causes is needed for the other in order for the breaking to occur. I think that this is a legitimate worry that needs to be addressed here and placed in the context of this thesis. After all, if *c*1 didn't occur then *c*2 wouldn't have

been able to break the window. The point is that one cannot get rid of a sense in which  $c_1$  and  $c_2$  are each necessary, and thus each part of the total causal factors needed for the breaking. What is being said is that because of the interposed window, or in the case of atom A, because of the surrounding field, the event  $e$  can only occur if all of those factors obtain. And so it might be argued that our example is missing the point because it is after all at best an example of joint causation.

I think that this objection can be met. It seems to me that such an argument would make it impossible to speak of overdetermination at all. Since if we go back enough we can always find that there is a connection between the causes that *prima facie* we thought were overdetermining. The causal world, after all, is extremely interconnected, and there is reason to suppose that the two causes that we focus on as being overdetermining might depend on a causal factor antecedent that relate causally both histories. But in normal parlance, and in particular when one countenances cases of overdetermination, one is talking of synchronic causal circumstances and their relevance to the effect, and when in the actual world, each rock hits the window they are not synchronic circumstances of each other!

In the case of the oxygen and the striking of the match, we know that each is a synchronic circumstance the obtaining of which is needed in order for the lightning to occur. Consequently it wouldn't be correct to suppose that causal competition happens, but for events that are not synchronic circumstances of each other the problem of causal competition raises its head once again.

I think, however, that it is important to make a note to those of you who remain unconvinced and still think that this is at best a case of joint causation because even then the main point in this thesis will stand. Because for this to be a genuine case of joint causation the mental has to make a causal contribution to the causal relation in each case of mental causation. However as we will see in section 3, this contribution will have to come either from emergent properties or from reduced properties, in which case one wouldn't obtain an acceptable solution to the problems that the nonreductive materialist faces.

Still, I register this possible disputation about the interpretation of overdetermination and my tentative contribution to its definition, however since it does not affect the main points that follow, I will not mention it again. I will then continue in my attempt at a better understanding

of overdetermination in the hope of changing some minds.

Now I said that even though  $c_1$  and  $c_2$  weren't sufficient for  $e$  they still were overdetermining  $e$ . I think that it is here that some intuitions about overdetermination show their face and tell a somewhat different story that Bennett would want us to believe. I have a very strong intuition that tells me that the reason we say that the breaking of the original window was overdetermined was because there were two causal histories that when entering into causal "contact" with the window, each one of them had the necessary causal power for the breaking. And here we can express the sufficiency condition of each one of them because none needs the other as a causal background condition. This sufficiency condition is expressed, in relation to the actual world, as it happened, and in the last instance, just before or in contact.

Let me express better this idea of overdetermination. I will suppose that it makes sense to say that in the causal history from an event like  $c_1$  or  $c_2$  to another like  $e$ , there is one last event of such causal history that is the one that makes causal "contact" with  $e$ , let's call it an ultimate event. Now, in my view, to say that  $c_1$  and  $c_2$  overdetermine  $e$ , is to say that they cause  $u_1$  and  $u_2$ , respectively the last event of the causal chain that goes from  $c_1$  to  $e$  and from  $c_2$  to  $e$ . And that each of  $u_1$  and  $u_2$  had the necessary causal means to break the window on its own. Notice this idea will fit perfectly into the normal case of overdetermination, and also in the case of the two rocks with interposing window.

We can express those conditions for overdetermination. An event  $e$  is overdetermined by  $c_1$  and  $c_2$  only if:

- (1)  $c_1$  is an ultimate event or is a cause of an ultimate event  $u_1$
- (2)  $c_2$  is an ultimate event or is a cause of an ultimate event  $u_2$
- (3)  $c_1$  and  $c_2$  are actual causes of  $e$
- (4)  $c_1 \neq c_2$  and  $u_1 \neq u_2$
- (5)  $u_1$  is a sufficient cause of  $e$
- (6)  $u_2$  is a sufficient cause of  $e$ .

Here we can see that both the two rocks with interposing window and the  $A$  and  $z$  case both meet the requirements of overdetermining causes. Notice that condition (3) rules out possible cases of preemption and (5) and (6) thwart the possibility of joint causation.

We can also see why such overdetermination might be thought to

be bad, since it keeps certain features of the standard cases that we saw before, when it is obtained in lawful or metaphysical terms in such a way that all cases of a certain kind of events meet the condition 1 to 6. After all we get a strong sense that  $e$  has more than it is needed, and this more is there with at least nomological necessity in certain cases.

Now to apply all this to the case of overdetermination (or redundancy) by causal relevant properties, lets imagine that  $e'$  is an ultimate event, and  $U1$  and  $U2$  are properties of  $e'$ . Let  $P1$  and  $P2$  be properties of  $c$  such that they give two distinct causal grounding relations between  $P1$  and  $P1^*$  and  $P2$  and  $P2^*$ , where  $P1^*$  and  $P2^*$  are properties of  $e$ . Moreover since  $e'$  is an ultimate event lets suppose that  $P1$  and  $U1$ ,  $P2$  and  $U2$ ,  $U1$  and  $P1^*$  and  $U2$  and  $P2^*$  establish all causal grounding relations between those events.  $U1$  and  $U2$  are ultimate causal grounding properties, that is, the properties of ultimate events that are in such causal grounding relation with properties of the event caused.

Now we can express those conditions for overdetermination in the property case. An event  $e$  is overdetermined by the properties  $P1$  and  $P2$  of its cause  $c$  only if:

- (1)  $P1$  is an ultimate causal relevant property or is in a causal grounding relation with an ultimate property  $U1$
- (2)  $P2$  is an ultimate causal relevant property or is in a causal grounding relation with an ultimate property  $U2$
- (3)  $P1$  and  $P2$  are actual causal relevant properties of  $e$
- (4)  $P1 \neq P2$  and  $U1 \neq U2$
- (5)  $U1$  is a causal grounding property of the causal relation between  $e'$  and  $e$
- (6)  $U2$  is a causal grounding property of the causal relation between  $e'$  and  $e$ .

I think that this notion of overdetermination captures all the kinds that are normally talked about, but goes deeper by picking on what are in reality the specificity of overdetermination making the notion more explicitly and more easy to understand. As such we can see that certain causal events that might be otherwise difficult to assess in relation to issues of overdetermination become easier to assess because we now know better. And we know better because we know that the issue of

overdetermination is an issue of matters that have to do with the ontology of the situation and what in terms of causation is going on in the actual world. As such if there is anything wrong with overdetermination it has to do with the picture that it presents us with. Is it a coherent one? Can we make sense of such ontology, where two different things are related somehow, say by some metaphysical form of dependency, and still have different causal powers as to establish overdetermination? Of course, and this is the point, it depends on how things are in the case under consideration. The present point is that issues of overdetermination should be assessed in terms of the ontological commitments of a theory. Can it make sense of the picture given above? I will argue later that in the mental/physical case it does not seem likely that a coherent picture of overdetermination can be made to save the nonreductive materialist from the exclusion argument. That is, the ontological commitments of nonreductive physicalism do not permit us to say that both properties are actual causal properties of an event.

Does this way of thinking about overdetermination contradict somehow the kind of counterfactual reasoning that Bennett says that we normally make in such cases? Well, it sure does even if instead of concentrating on the usual kind of events like  $c_1$  and  $c_2$  we concentrate on ultimate events. After all the same reasoning about necessitation claims that would fail to pass Bennett's test are also easily applicable to ultimate events.

Is there any deep lesson to be learned for this failure? Not at all, because it is usual that the common sense understanding of things have to be understood anew or in a slightly different way when more is demanded of it than is usually found in common practice. After all, counterfactual thinking fits the bill in most of the cases. It is a practical way of doing it, without being metaphysically deep. And when we get metaphysical it sometimes fails.

But it has implications for our understanding of exclusion arguments. A trivial one is that it refutes Bennett thinking. It is irrelevant to questions of overdetermination, and the worries that it brings with it, to know what would have happened in a counterfactual situation. The metaphysics of the situation, the metaphysics that our theories imply, should be our guide and should be enough.

It seems to me that it is right to say that the objector cannot defend causal compatibilism by diminishing the issue of overdetermination.

By all means it seems, at first sight, that in such a case, as the mental/physical one, there is overdetermination. However I think that the superficial look can be shown to be misleading. In the next section we will see that in the metaphysics of the nonreductive physicalist, the relation between mind and body is quite unstable and in light of mental causation difficult to make sense of. It seems to me that he cannot account for overdetermination.

## SECTION III

### 3.1 Introduction

In section I we have seen that nonreductive physicalism faces the problem of exclusion. This problem threatens to preempt the mental of any causal relevance in the causation of behaviour. But the form of the argument gives a clue as how the nonreductivist might escape and save the causal potency of the mental – countenancing overdetermination. In such a case he would elude the argument made at the end of section I. In section II we have seen that he can do this only if his metaphysical commitments are consistent with overdetermination. In this section it is shown that he cannot take the overdetermination route to escape exclusion. Countenancing overdetermination brings his position close to either emergentism or reductionism in a way that ends up being inconsistent with his own position.

I think the uneasiness that is frequently seen in discussions of mental causation regarding the issue of overdetermination is in fact best seen as a tension, mentioned in section I and defended further in section II, within the ontological claims of nonreductive physicalism. On the one hand it is committed to the distinctness of mental and physical properties and their causal relevance - raising the prospects of overdetermination. On the other hand it finds the prospects of a mental realm having an ontological significance on its own, which seems to be a consequence of the postulation of mental causal properties, quite puzzling and threatening to a good physicalist. Anxious for his position not to be confused to any form of significant dualism, he will immediately point out not only that mental properties are properties of physical objects and events, but also that the mental is metaphysically dependent on the

physical. But then such intimacy between the mental and the physical is seen as a puzzling feature of an overdetermination claim.

We can now say what the puzzling feature is, or where it resides, following our thoughts in section II. What the tension is pointing to, or why the overdetermination claim brings such complaints, is that it is a symptom of something going wrong at the ontological level.

It is curious that when one follows the literature that attempts to solve the problem of mental causation one finds it common the complacent assumption that the position they try to save, namely nonreductive physicalism, is well defined and that what has to be done in order to solve the problem of mental causation is just to tinker within the position with the assumptions it makes and find a way to accommodate the causal relevance of mental properties. However the troubles for the nonreductive physicalist goes deeper than mental causation. The trouble of accounting for mental causation is just a symptom of more fundamental and constitutive difficulties that besiege the nonreductivist position. The trouble with overdetermination brings those difficulties to the fore.

The problem, I think, lies in that the notion of dependence, in particular the fundamental notion of realization, is made on the base of an intuition and is developed in the context of an ambition - not very deep ontological concepts, to say the least. The intuition is based on the multiple realization argument and the ambition is the desire that psychology could be investigated independently of its physical substrata. This ambition is expressed starkly in the hope of the computational theory of mind that the appropriate implementation of a computer program would have genuine mental properties just as we do, making the study of the human mind, moreover, the study of psychology, independent of the study of the human brain and as such quite a general and independent science on its own. I think that this view colours the interpretation that the nonreductivist makes of the multiple realization argument and that leads to the development of his position in a way that is incoherent or implausible. Of course, the nonreductivist would say that the reason he thinks that psychology could be an autonomous science is just a consequence of the multiple realization argument.

However, it seems to me that this is a misguided reading; nonreductive physicalism is a position that is inherently incomplete and I think incompletable since cannot account for the notion of realization.

He can advance some as we will see, but it does not respect all his commitments, either by being inconsistent or highly implausible. And the reason is due to its ontological framework that is directly dependent on its interpretation of the multiple realization argument. The lack of consideration to ontological details, that spring from the ambition that psychology can be studied independently, is the source of the trouble. Once we consider the details, they do not add up to the intentions.

The notion of realization by grounding the metaphysical relation between the physical and the mental give us the target to investigate if the claim of overdetermination can be sustained. If the notion of realization is coherent with the nonreductivist position regarding the causal relevance of both mental and physical properties, then premise (4) of the exclusion arguments given in section I, which rules out overdetermination, could not be maintained, bringing down this form of arguments against nonreductive physicalism. It will be seen in this section that the nonreductivist cannot claim the overdetermination move, because his metaphysical commitments do not allow it. In what follows I intend to show this in detail.

We saw that the worry about overdetermination was particularly troubling in the case of downward causation. Lets take a look at the ontological details.

So we have something like this:  $m$  causes  $m^*$  in virtue of  $M$  and in virtue of  $P$ , both properties of  $m$  that can with sufficiency ground each on its own the causal relation between  $m$  and  $m^*$ . Downward causation is the claim that  $M$  can ground the causal relation only if type connects appropriately with  $P^*$  of  $m^*$ . Now the type connections are supposedly distinct; after all the type connection between  $P$  and  $P^*$  is given by a physical law, and whatever type connection exist between  $M$  and  $P^*$  cannot be such a law.  $M$  is a bona fide mental property after all.

Now, as we have seen in section I it is plausible to hold that causal grounding relations specify the causal powers that the properties endow the object or events with. It might even be right to say that it is because of those causal powers that the causal relation obtains and because of those powers that the laws or other type relations are what they are. We do not have however to take sides regarding this matter. It might be instead that those properties *plus* those causal-grounding relations endow the objects with those causal powers. Either way, once we have

the grounding relation we know that those objects or events have certain causal powers in virtue of the properties that the object or event has. It seems then reasonable to suppose that different properties, even supposing that they are more than their causal powers, have to endow different causal powers to the objects possessing them, even if due to certain circumstances those powers go without manifestation.

Now let the causal powers of the mental property<sup>3</sup> *M* be *Mcp1*, *Mcp2*, *Mcp3*, etc and let the causal powers of the physical property be *Pcp1*, *Pcp2* etc. Now to say that both *M* and *P* overdetermine some of the effects of *m*, specifically the capacity of *m* interacting causally with *m\**, is to say that each causal property on its own can ground the causal relation, which means that the causal powers that each of the properties bestows on *m* are sufficient on their own to determine the causal relations that *m* has with *m\**. But this cannot be the whole story. That the causal powers of *M* can determine *m*'s ability to causally interact with *m\** cannot rule out the ability of those of *P* to do their job. Not without giving rise to a conflict with completeness.

So every time we have mental causation the picture is that both sets of causal powers, the causal powers that *m* has in virtue of being *M* and the set of causal powers that *m* has in virtue of being *P* get to do their causal work. Moreover since this is a case of mental causation they are sufficient on their own for effect *m\** to be *P\**.

But we know, and the nonreductive physicalist will make sure we remember, the mental is dependent on the physical. This dependence tells us that *m* is *M* because *m* is *P*. And that if *m* were not appropriately *P*-like, *m* would not be *M*. This implies that if *m* were not *P* or *P*-like then *m* would not have the causal powers that we supposed *M* to endow *m* with. It is here that we want to know about the relation between *M* and *P* and their respective causal powers. Since such dependence relation is given more fully in terms of the notion of realization I will follow those proposals, however we can see the options open to us can be expressed in more general terms. Either (A) the mental and the physical have a totally different set of causal powers, that is, the set of causal powers of the mental and the physical do not intersect or (B) they have some causal powers in common, but the physical and the mental have

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<sup>3</sup> Of course this means the causal powers that the property bestows on the objects in virtue of the object having the property.

powers that go beyond what they have in common, or (C) the mental while sharing some causal powers with the physical surpasses it by having causal powers that are not found in the physical property, or (D) the physical while sharing some causal powers with the mental surpasses it by having causal powers that are not found in the mental property, or (E) they have the same causal powers.

### 3.2 (A), (B) and (C)

I will begin by analysing (A), (B) and (C) since they have a problematic feature in common: they all presuppose that there are causal powers that the mental has that are not found in the physical realizing property.

Randolph Clarke (1999) suggests a way of formulating the realization relation that gives substance to (C) and since we will find that position problematic on account of this feature that it shares with (A) and (B) it is a good place to start. Consider, says Clarke, that when a mental event  $m$  causes another mental event  $m^*$ , as when pain causes the desire that the pain goes away, there will be some physical realization base  $PH^*$  for  $M^*$  in humans another  $PA^*$  for aliens etc for all kinds of systems and creatures, where  $M^*$  is the desire that pain goes away. Now take in consideration that this means, due to downward causation, that mental property  $M$  has the causal power to interact causally with one set of physical properties  $PH^*$  in humans another in  $PA^*$  aliens etc for all the different systems.

After all  $M$ 's causal powers, or the causal powers that  $M$  endows the events or objects that have it with are always the same. How could the very same property at one time or in an object endow it with a set of causal powers and at another time or in a different object endow it with a different one? It does not seem plausible. Either view of properties and their causal powers, seems to support such analysis. If one thinks that properties have the causal powers they have, primitively, due to their nature, a view that I favour, then the same property will always endow the objects or events with the same set of causal powers. Or if you think that properties have the causal powers they have due in part to their categorical nature plus the laws of nature then it seems that the very same property will always endow their objects or events with the

same set of causal powers in nomological possible worlds.

Not to confuse this with the view that all of those causal powers are active every time an object possesses a property. A vase does not break because it possesses the property of fragility. This property can endow a vase with a set of causal powers that remain without expression till certain conditions are fulfilled. Only then their causal work is done.

This means that M is such as to be able to establish a causal grounding relation with each of M\*'s heterogeneous physical bases. M has such set of causal powers that are sufficient to interact with each of M\*'s realization bases. However it is not plausible to suppose that this causal power is found on any of M's realization bases. Take PH the physical property that realizes M in humans. Now this physical property will have the power to causally interact with the physical base PH\* of M\* (the desire that the pain go away) in humans. But it is highly unlikely that PH has powers to causally interact with anything like PA\*, that is, the physical realizer of M\* in aliens. Clarke's proposal then seems to be based on the idea that the causal powers of the mental exceed those of their physical bases.

This view has some strange consequences. It seems to imply that when a human has the mental property of being in pain then, it has the power not only to causally interact with PH\* but also PA\* and any other realizing property of M\*. But how can this be? PH, M's realizing physical property in humans is some complex structure of neurons, and this structure, realizes M in humans because, lets say, it is causally embedded in the human organism in a way that occupies the causal role of pain. One of the consequences of this causal role will be the bringing about PH\*, that is, the realization base of the desire that the pain goes away in Humans. But there seems to be no way to make sense that PH can also bring about PA\*. Just consider that PH is embedded in a system composed by neuro-physical properties, carbon based, while the alien system might be extremely different from the human, so different as being chemically incompatible. So M has some causal powers that none of its particular realizers has, though in the disjunction of the realizers one can find every type of causal powers that M has. It seems very difficult to make sense of this hypothesis.

Clarke(1999) says that

“When an object possess a property that carries with it the power to cause, in certain circumstances, a certain effect, that object may lack the

power to cause, in the present circumstances, that effect.”(p.301)

So we might say that while a human has M, due to the circumstances M can only bring about PH\* and not PA\* or any other alien base. But compare this with the example given above, about the vase and its fragility. If the vase is fragile and it is in a very safe and stable position it will not break, due to these circumstances. But the vase has, due to having the property of fragility the causal power to break even if it does not manifest such potential. But the question then is how can a human, by having M, have the potential to bring about PA and other physical effects that are extraneous to its chemistry, even if they go without expression.

Clarke suggests a way to make sense of this idea – to understand how M has the powers to bring about all the different realizers of M\*, we have to suppose that in any realization of M in a particular organism, say a human, all the other realizers have to be present somehow in that organism, but that somehow they are in such a way embedded in the organism that the causal powers idiosyncratic to other realizers except the human are somehow inactive. This, at first sight, might seem to be a way to understanding why M has more causal powers than the powers of the realizing property.

There is however some implausibility to this suggestion to say the least, and one difficulty that jumps to the eye is that it is not clear that PH is realizing M in this last case, if the other realizers are needed to justify M’s causal powers. But there are more serious problems. To say PH realizes M and M has causal powers that cannot be found in PH, implies that some other facts about humans have to be true in order to understand the realization relation. How can PH realize M and M have powers that are not found in PH? This seems not to make sense. After all the realization relation is a relation that attempts to specify a metaphysical dependence of the mental on the physical. But how can physical primacy be defended if the notion that supposedly gives its ontological foundation cannot account for such important fact as that of causation.

### **3.3 Emergence**

The point is that if somehow the only way to give an account of

mental causation within the nonreductive physicalist framework were to accept this picture, or some improved one but still claiming that the causal powers of the mental go beyond those of the realizing property, then the only way to make sense of the notion of realization would be to appeal to emergent properties of physical systems.

However the positing of emergent properties with its set of distinct causal powers brings lots of problems for the nonreductive physicalist.

That these features of mental properties are taken as definitive of emergence can be seen in the following passage by Tim Crane (2001). He writes that

“An emergent property, on this conception, is one that has causal powers that are distinct from the causal powers of the lower level properties on which it supervenes. If you give a list of an object’s causal powers, listing only the causal powers of the lower-level properties of the objects, then you will not have given a complete list of the object’s powers.” (p.216)

This is exactly the view that we have been analysing. But then one cannot see how to make sense of the completeness of physics, that the nonreductive physicalist, as a physicalist, is committed to.

Of course the problem of the completeness of physics would not be an issue to a champion of emergentism, as he would happily admit its violation. By the presence of emergent properties, certain systems enter in causal relations that cannot be accounted for in terms of the causal powers of physical properties. For the emergentist the mental (and other special sciences properties that share this feature) is something “over and above the physical”. Moreover the emergentist can provide a natural justification for the explanatory potential of the special sciences - they work as well as they do because they do pick up the properties and causal powers that are proper of their specific domain of explanation. No lower level type of explanation or base properties could do the explaining they do since they do not possess the causal powers that are required to appeal in order to have a successful explanation.

But wait, maybe we are going a bit too fast. Maybe there is a physicalist way of meeting the challenge of accounting for type distinct mental causal powers that certain objects are said to have in virtue of having a mental property. Suppose a creature or system *S* in virtue of having a mental property *M* has a certain causal power, say  $\Omega$ , that none of its

possible physical realizers have<sup>4</sup>. By having this power, let's suppose that there will be a possible situation where this power will manifest itself in S in a physical way. Now in such a case, in order to account for the physical effects of S does completeness need be breached?

Suppose someone says no, because all that is happening is accounted for by massive overdetermination. That is, all that happens in the physical world can be explained physically but it's sometimes duplicated by distinct mental powers, not only numerically distinct, but type distinct also from the physical. Now, due to the claim of massive overdetermination, all effects would have physical causes, and consequently there would always be a fully physical explanation for every physical effect.

Notice however that what we are conceiving is that the mental power  $\Omega$  endows S with a power type distinct from any existent in its putative physical realization. Now how can we suppose that S has  $\Omega$  and simultaneously not attributing to S's possessing of  $\Omega$  certain effects that would otherwise be absent from S's manifestations? It seems that S's possessing of a causal power type distinct from the causal powers that are due to its physical properties, implies that to explain S's physical manifestations we have to appeal to  $\Omega$ , thus violating completeness.

Now since accounts (A), (B) and (C) share this feature, they have to be rejected by the nonreductive physicalist. He cannot allow for the mental to have causal powers that are not type identical to causal powers possessed by physical properties. That is, the realized property cannot have any causal powers that are type distinct from the causal powers of the realizing property.

### 3.4 Numerical Identity of Causal Powers

But this raises the possibility that while being type identical they are numerically distinct. So, let P be a physical realizing property of M in S. Now suppose that P endow S with causal powers CP1, CP2, CP3 and CP4, and that M endows S with causal powers CP1, CP2 and CP3

<sup>4</sup> This is going a little bit farther than Clarke's account in that in his account M's causal powers are accounted for by the union of all the causal powers of all the physical realizers. However the same reasoning developed here applies to Clarke's account also, if only we take  $\Omega$  to be type identical to some causal power of some physical base of M, but not of this particular realization.

and these latter causal powers are numerically distinct from those that P endows. Lets suppose that M can ground causal relations between events involving S. Since M does not have causal powers type distinct from P, those causal relations can be subsumed in physical laws. So there does not seem to be problems with completeness.

Moreover physical events are overdetermined by the causal properties of their causes. Contradicting claim (4) of the exclusion arguments that says that there is no overdetermination. But as I argued in section II, the issue of overdetermination has to be decided in terms of the ontological claim of the position. If a proposal gives ontological substance to a claim of overdetermination, then there is not further issue to settle.

But can a nonreductive physicalist make sense of such proposal? I don't know any philosopher who defends such a thing. And the reason for that seems to be that it does not make much sense in a physicalist framework. After all the mental is supposed to depend with metaphysical necessity on the physical, and this dependence is in part used to express the causal priority of the physical domain. Is the fact that the mental duplicates some of the causal powers of its physical realization base an assertion of the priority of the physical and as such taken to be in the right physicalist spirit?

Take fragility and the physical causal structure that realizes it. On this proposal, fragility duplicates some of the causal powers of this structure, presumably the powers that manifest certain effects that are characteristic of fragility. Now, what does it mean for a vase that is fragile, to have this doubling of causal powers? Is it more fragile than it would be, if per impossible, it had the same structure and not the fragile property? Thus in the actual world it would break more easily that it would break if it had the same structure and not the realized property?

I can't make sense of this idea as it seems a form of emergence, but if we suppose that the doubling of causal powers that individuate fragility are not operative then why do we suppose them to be there at all? Moreover since these causal powers are taken to be type identical to the causal powers of realizing properties, on which they depend, it is only natural to suppose that the causal powers of the mental are numerically identical to the causal powers of the realizing properties. This seems also to be the position of most philosophers that reject (A), (B) and (C) and opt for (D) or (E).

So in the rest of this discussion I will take it that the nonreductive physicalist denies both the possibility of the mental having causal powers that are not found, or surpass those, of the realizing property, and that there is no doubling of causal powers. So the following condition has to be respected: Each causal power of a mental or special science property is identical, in the sense of numerically identical, with a causal power possessed by its realizing physical property.

### **3.5 (D) and (E)**

If (A), (B) and (C) cannot give substance to the notion of realization, it might seem however that (D) is a lot more promising. By sharing all causal powers of the mental with the causal powers of the physical, while letting the physical have powers that surpass those of the mental, it gives a clear sense to the primacy of the physical, and takes the magic out of the notion of realization, that seemed to be the only way out in those other cases.

What is in need is a proper characterization of the realization relation that gives sense to this demand. Sydney Shoemaker (2001) gives one such understanding of the notion of realization that tries to make sense of the difference in causal powers between realizer and realized while simultaneously giving an account of mental causation.

Shoemaker thinks that distinct properties confer to a system different sets of causal powers. This view of properties as individuated by their sets of causal powers is consistent with the view that we have expressed about the way to understand the reality of mental properties. To be real is to have causal powers, which means to make a difference in the world. Such difference might be expressed by the ability of mental properties to ground causal relations.

Now if a certain property P confers to S a set of causal powers, say, CP1, CP2, CP3 and CP4 then it seems that a property, say M, individuated by the fact that would confer to the same system causal powers CP1, CP2 and CP3 is in fact a different property since it doesn't endow S with exactly the same set causal powers.

How should we understand the relation between P and M? Notice that when a system has P it will also have the causal powers that individuate M. Can we then say that both P and M are present in the sys-

tem? Shoemaker thinks that we should understand properties that have this feature in terms of the determinable-determinate relation. So if a system has some determinate property, say it is red, then it has the determinable property of being coloured. The idea is that red has a certain set of causal powers that it confers to the system and there is an appropriate subset of those causal powers that constitutes or amounts to the system being coloured. So when P is instantiated in a system, it means that M is also instantiated in that system since on this reading property M will be a determinable of P, and when a determinate is present so is the determinable.

So in system S, P realizes M because the causal powers given to S by M are a proper subset of those given by P. Since in each case a mental property will have a subset of the causal powers of the physical realizing property there is no causal competition between them and as such the issue of exclusion does not even arise.

Now this seems to give an especially interesting reading to multiple realization. Multiple realization tell us that due to the probability of extreme heterogeneity of the physical properties that realize mental properties, we expect to find for such diverse realizers very different sets of causal powers. But since all those realizers no matter how heterogeneous, realize the same mental property they have to have in common at least the subset of causal powers that are sufficient for the causal role that individuates the mental property that is realized.

Take pain and two of its realization bases. Say C-fibres firing and the vibration of silicon. When C-fibres fire in humans they will feel pain and have all sorts of pain behaviour and the same for aliens upon the instantiation of one of their physical bases. Whatever the set of causal powers that C-fibres and Silicon vibration endows to the organisms that have one of such realizing properties it has to confer the causal powers to do the things that specify the causal role of pain. Supposing, as always, that the pain they share is the same (otherwise there wouldn't be any prospect of an autonomous general scientific psychology) then those realization bases have to have the causal powers to lead to avoiding behaviour, nursing behaviour etc. if such behaviour is part of the causal role of pain. That is, they have to share the same causal powers that constitutes the causal role of this mental property. However they also have other causal powers that aren't shared. When a scientist opens up a human skull and looks at C-fibres they will look grey to him and

when he studies the brain of an alien he might find out that it is translucent and emits a buzzing sound. However it might be that none of the causal powers that are responsible for these phenomena are relevant for those properties to be the realizers that they are.

While accounts (A), (B) and (C) had difficulties because they made the notion of realization mysterious, this one, by keeping the causal powers of the mental within the bonds of the physical promises to offer a proper physical characterization of realization. The mental here has no causal powers that are not part of the causal powers of a bona fide physical property.

But there are problems. The crucial question is why we should understand M as an extra feature of creature or system S. Why is M a mental property and not a physical property? Since all the causal powers of M are a subset of the causal powers of a realizing physical property P, why should we conceive the existence of any other causal property besides P? If S is P then S has all the causal powers that P endows S with. Let this causal powers, be CP1, CP2, CP3 and CP4. Now what this notion of realization says it that by having these causal powers S also has M, since M's causal powers are, lets suppose, CP1, CP2 and CP3 (a proper subset of the causal powers of P). So M shares the selfsame causal powers CP1, CP2 and CP3 with P. But then why should we suppose that when a creature S has P it also has M as a distinct causal property? Since there is no doubling of causal powers, CP1, CP2 and CP3 are causal powers of S that are present in S once and not twice over. So, once S has P why do we need to suppose that there is also a mental property present? The present point is that M as a realized property seems in risk of collapsing from a broadly physical property into the kind of physical properties that *prima facie* realizes it. In the remaining of this paper I want to show the plausibility of this point in detail.

It might seem that a defence of M can be found in some considerations offered by Shoemaker that are in the same spirit to some of what we said in section I concerning the special sciences and cross-classification. The view<sup>5</sup> might be expressed this way: A set of causal powers is such that there is a property that confers such causal powers to an indi-

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<sup>5</sup> Here I am merely saying what I think is the spirit of a justification of taking M as a real property, and not actually specifying anybody's take on it, though close to what Fodor(1974) says in "Special Sciences".

vidual, just in case this set of causal powers is such that there are laws that pick this property and causal powers and unifies them in a theory M. This theory then, consist of laws that specify how these properties together operate to bring about, in certain circumstances, the various effects that they are capable of bringing about.

So P being a genuine physical property figures in all kinds of laws that describe how the causal powers CP1, CP2, CP3 and CP4 operate together to bring about all the kinds of effects that P is able to bring about. But *supposedly* these laws will not be able to express the theory that concerns the causal powers of M. For that we need theory M. Moreover, following multiple realization, M can be realized by many different physical properties, PH, PA etc. Now since these properties are different and sometimes said to be wildly heterogeneous from the physics point of view, there are no similarities to be stated in physical terms. No point of view within physics that can unify these realizations. But they nonetheless can be unified from the point of view of M, the mental point of view. And this unification points to the fact that all the realizing properties of M, have to have in common, in spite of their physical heterogeneity, the set CP1, CP2 and CP3, the causal powers of M. Fodor (1974) says,

“Any pair of entities, however different their physical structure, must nevertheless converge in indefinitely many of their properties. Why should there not be, among those convergent properties, some whose lawful interrelations support the generalizations of the special sciences? Why, in short, should not the natural kind predicates of the special sciences cross-classify the physical natural kinds?” (p.134)

Indeed why not. After all we started out with the assumption that there are causal grounding mental properties. And these causal grounding relations as there was said to exist between mental properties (and within the special sciences properties) were supposed to specify the causal powers of the mental. It seems natural then to think of theory M as consisting of sets of those causal grounding relations, and M having the causal powers CP1, CP2 and CP3. According to such a view we know that there are special sciences properties because of such generalizations, because there are such causal grounding relations type connecting special sciences properties.

But the fact that CP1, CP2 and CP3 are also causal powers of property P seems to imply that those causal powers are physical causal pow-

ers. Contrary to claims (A), (B) and (C), where some powers of the mental had no *grounding* in the physical, here they are trivially grounded by being causal powers that an object has in virtue of being P. Is this a weakness or a strength of this position? A nonreductive physicalist, like Fodor (1974), would claim that such view is a strength, because

“The point of reduction is not primarily to find some natural kind predicate of physics co-extensive with each natural kind predicate of a reduced science. It is rather, to explicate the physical mechanisms whereby events conform to the laws of the special sciences.” (p.131)

Such a picture would be somewhat like this: There would be a causal grounding relation LM that would specify, or establish a type connection between two mental properties, M1 and M2. In S these mental properties would have as realizing properties P1 and P2, lets suppose. Now due to LM we know that m1 is causally related to m2. But M1's and M2's causal powers are a subset of the causal powers of P1 and P2 respectively. However since physics is primary we know that there must be a causal law LP that relates these events. This law will be one that relates P1 and P2, giving a coherent picture that explains how there are “physical mechanisms whereby events conform to the laws of the special sciences”. This conformity can be seen by the fact that the physical law is compatible, in this case, with whatever causal interactions are specified by the grounding relation that subsumes the mental property. After all such grounding relations specify the causal powers of the mental and those are a proper subset of the causal powers of the physical realizing property.

Now, in every instance of mental causation or of special sciences causation, there would have to be some story as told but the point is that the causal grounding relation LM would have an application, that is, would be able to ground causal relations between mental events or special science events, *even* in cases where LP would not be applicable. In fact every time one changes systems that still have M one would probably find out that the physical laws would be distinct, due to the possibility of the heterogeneity of realization bases, but that LM would still be valid. Here one sees that LM gives a unification that those different physical laws could never give. Or so it seems.

### 3.6 Problems for (D) and (E)

This view of the relation between special sciences' properties and physical properties and their standing to causation seems quite compelling and seems to be the reason why nonreductive physicalism has been so appealing to a lot of philosophers. But I don't think it quite works.

If we take a look at this account and ask why do we think that the grounding relations that type connect mental properties are not physical causal laws it seems to me difficult to give any positive reason. In fact I think that the reason the account given seems so seductive is because we are focusing on the wrong kind of things when we begin to reason. We begin by focusing on the regularities of the special sciences and psychological type relations. In the beginning of this section I said that there was an intuition, the multiple realization argument, and an ambition, the independence of psychology and other special sciences vis-à-vis the physical sciences that coloured the interpretation of these issues in a way that would not let us be ontologically serious. It seems to me that this is evident here. When one is presented with a view of realization where the causal powers of the mental are said to be a proper subset of those of the physical one does not question the ontological implications of the view and reason from them as a starting point but instead reads into it the ambition of our previous assumptions.

But looking at the metaphysics of the realization relation I think the following picture is much more plausible. Since every realization of M or any other special science property has in common certain causal powers, say CP1, CP2 and CP3 in the case of M, then why should we not believe that in fact what a creature has in common when it realizes any of those special sciences properties is some physical property P\*? After all those causal powers are good physical causal powers, powers possessed by P! P\* would be a physical property that endows S with exactly those causal powers, CP1, CP2 and CP3 that were first identified as being the causal powers of M. P\* would be the realizer of M in all systems that have M. In what follows I will try to motivate this reading.

Of course not any set of causal powers points to a physical property at work, but if those causal powers are found together and unified by type relations then the best explanation for such a case is that we *happened to hit on a physical property*. We, after all, are talking about

causal powers that are a subset of those of a physical property. How come these causal powers do not point to a single physical property that is common to all the realizations of M?

The fact that there are causal grounding relations that specify the causal powers CP1, CP2 and CP3 seems to argue for M has we have seen. It is because of those causal powers that it makes sense to refer to the presence of the mental property. M is real on account of having those causal powers. But those powers are in S on account of P – P has causal powers CP1, CP2, CP3 and CP4. Now the difficulty is that it does not seem to make much ontological sense to suppose that there are two properties that are said to be causal, since two such properties would seem to require two sets of causal powers where one is *not* a subset of the other. If one is a subset of the other then that is *best* seen as pointing to the presence of one thing in the object, and not two. But in this case it is not possible to see the mental as able to ground causal relations, unless it is reducible to some physical property P\*. That is, the supposition that we always have taken for granted, that the mental is causal, only makes sense if the mental is reducible to physical properties (or if it is emergent).

The crucial assumption in the last paragraph is that if one property P endows an object with a set of causal powers it does not make much sense to suppose that the same object has another property M that is also a causal property where the causal powers of that property M are numerically identical to a proper subset of the powers of the physical property P. Of course this needs a little qualification: If the physical realizer of M, say P, is a complex property with physical constituents, say constituted by P' and P\*, then P will have as constituent P\* that, lets say, has CP1, CP2 and CP3 and P' has CP4. So P endows S with those causal powers because its constituents have those powers. This is fine. But if we want to claim in the mental case that M is a property that is not a constituent of any physical property, but is such that endows to an object certain causal powers that are numerically identical with some proper part of the causal powers of its realizer than we have a problem.

Take two realizers of M, PH and PA. So there are laws that subsume PH and PA respectively such that each of them is said to endow certain causal powers to the creatures that have them. Among them are CP1, CP2 and CP3 the causal powers in virtue of which each of the realizers

are said to realize M. Now the reason, according to such a view, that M is a significant entity is that there are grounding relations that subsume M. Such relations specify how the causal powers of M, operate. But those powers are identical to some of the powers specified by the physical laws that subsumed PH and PA. So how came these grounding relations are not physical laws, thus making M reducible to a physical property? Once we try to understand this problem from bottom-up, instead of top-down, it seems that this is the picture that is required to make sense of such a view. It gives us the best explanation.

That is, if we assume that a set of causal powers points to a property in case there are grounding relations that subsume such property, then it would seem that there would have to be a physical property in common in every case of the realization of a mental property. And the reason is that the causal powers of the mental are a subset of the causal powers of the physical. Only on the implausible assumption that there are causal powers of physical properties that could never figure in physical causal laws could we negate such a reading. But then those physical laws (grounding relations) would describe exactly those powers that we take to be the powers of M, pointing to a physical property at work. But if this were plausible then such a physical property would be coextensive with the putative mental property. The making of reduction. That means that it is reasonable to think such notion of realization cannot account for the delicate tension that is required to keep distinction and dependence between mental and physical properties while accounting for mental causation.

I think that these considerations are enough to settle the issue regarding causal powers of the mental that are numerically identical to a subset of the causal powers of the physical. I will however go into a more speculative mood and try to show another possible reason to be suspect of either (D) and (E).

### **3.7 More Problems: a bit of Speculation**

I think there are more reasons to believe that such account fails. A good way to see the problem is to focus on the realizers. PH and PA are physical realizers of a certain mental property M in humans and in Aliens respectively. They are said to be heterogeneous properties from the

physical point of view; nonetheless these properties realize M. In such a case M's causal powers CP1, CP2 and CP3 are a subset of the causal powers of PH and PA. The following question brings to the fore my worries : How come PH and PA, being heterogeneous, can endow an object the causal powers that are said to be distinctive of certain mental property? There is a straight answer to this: presumably because they realize M! And by realizing M they have to have those causal powers. But there is something funny here that needs to be settled. How come realizers that are heterogeneous from the physical point of view can have and bring about the same physical manifestations? Note that this happens to all physical realizations of M, no matter how heterogeneous they are.

I think that this issue can be settled within Shoemaker account of property individuation: that properties are individuated by their causal powers. If one takes the view, that causal laws depend on the nature of natural properties, as is the natural reading of such an account, then the causal powers of those properties are to find a specification on those laws. And so if there are regularities to be found that depend on causal powers CP1, CP2 and CP3, or the causal powers of any *prima facie* special science property, then it is compelling to think that this is so because of the existence of some physical property P\* that is individuated by CP1, CP2 and CP3.

That there are such regularities can be ascertained because of the existence, in every case of mental causation, of physical mechanisms that ensure that the right effects came along. Even extremely heterogeneous physical systems, if they realize mental property M, have to bring about those causal effects that are distinctive of M. That means that those systems have to have the causal powers CP1, CP2 and CP3. But then, if we individuate causal properties in causal terms it seems that those systems have to have some physical property in virtue of which those systems bring about those same effects. Physical systems that can, hypothetically, be so different from each other can implement those causal powers physically only if they have in common something physical. To be able to bring about those effects in physical ways means they have to share physical properties.

But what about the view that objects have the causal powers they have due both to the properties plus the laws of nature? Is it not coherent to suppose that two distinct properties, even wildly heterogeneous

physical properties, could be subsumed under laws in a way that those objects would have a set of causal powers in common?

There are two distinct puzzles here, which need explication. One seems to be asking for an explanation of why certain objects have come to possess certain properties with certain causal powers. Why do certain objects have heterogeneous properties that share a proper subset of their causal powers, in virtue of which there are realizers of the same property?

David Papineau (1993) raises the question about functionalism

“If there is nothing physically in common among the realizations of a given mental state, then there is no possibility of any uniform explanation of why they all give rise to a common physical result. And that’s what I find puzzling.” (p.2 of chapter 2 of the online version)

He goes on to argue that in cases where there is no other explanation then “the notion of a reduction is precisely the notion of an account which shows that nothing incredible is happening at the physical level”(p.7 of chapter 2 of the online version). What is the other explanation that would preclude the need of reduction? Whenever there is purpose or design in the objects under consideration. If we can have an explanation of why certain objects behave the way they do that points to a selection of the properties that can do whatever is necessary then there is one sense where the puzzle is dissolved. Why do they behave that way? Because they have properties that were selected exactly because they could do the job.

Suppose we want to build eyes and we need material to make a cornea. We need something that lets the light in without much distortion. So if someone asks why all those eyes, in spite of being physically heterogeneous have the power to let the light in, we can give them a straight answer. Because, in spite of the heterogeneity of the material, we chose only as building blocks whatever we could find that lets the light in. Papineau takes it that such explanation remove the puzzle of why heterogeneous properties can nevertheless realize the same properties. But lacking such explanation, he thinks that the best explanation for such phenomenon is in the existence of certain property  $P^*$  that all those realizations share. Leading to reduction.

But there is another puzzle. A puzzle that applies to both cases; where there is a teleological explanation and to those cases where there isn’t one. Take all those materials that were used to build up a cornea.

All those distinct materials are able to do the job as well as they do because they were selected by their ability of letting the light in in a suitable manner. But, once again, ask: If those materials are heterogeneous how come they are able to bring about the same effects? How came those materials share so many causal powers? Having a teleological explanation does not even give us a clue to a possible answer. Pace Papineau, I find that it is here that it would be incredible that there was no explanation as to why heterogeneous properties have certain causal powers in common but do not have a physical property in common that is responsible for it. It would seem that it is a necessary requirement of a physically acceptable world that commonalities of causal powers point to commonalities of physical constitution. I think the reason Papineau does not accept the second puzzle has to do with the common view that asserts that it is a brute fact of our world that different things can bring about similar effects. The idea is that it is a brute fact that wildly heterogeneous objects, can bring about similar effects. That is, distinct properties could be subsumed by laws in such a way that they could endow objects with the same set of causal powers. Nevertheless I am not persuaded.

The reason is that I find Ned Block's (1997) Disney Principle highly intuitive and plausible

"The laws of nature impose constraints on ways of making something that satisfies a certain description."(p.120)

This principle would make it credible to think that there are only so many ways that the world can be made that lead to the same results. One consequence of this would be that the notion that a realizer can be wildly heterogeneous from the physical point of view is extremely implausible. But it seems to me that this principle can be seen to be much stronger than the uses Block makes of it. One way to motivate this principle might be to ask what happens at the lowest level of causation. Take two distinct fundamental particles that in an accelerator are made to crash into a third fundamental particle. Do they cause the same effects? I would assume that rejecting the Disney Principle would amount to the claim that they could cause exactly the same effects. But how could that be? It might be a brute fact of the world, but I take it that such idea goes directly against the principle of economy. A particle that had exactly the same effects of another would seem not to be required.

But take the following supposition; that both properties had the

same effects in certain types of situation but would differ in another's. This would give space to make sense of their distinctness. Take one of the situations where they would differ and another where they would have the same effects. How to explain this? There is nowhere else to go to explain the difference since we are talking about the fundamental entities of the world. The only way would be to refer to the laws of nature as a brute fact to explain such a difference and I take it that that is strange. Compare this to a situation where one of the particles were a complex entity with a component of the same type of the other. In such a case we could perhaps see how they could behave identically in certain situations. And how they could differ. This would be explained by their different structure. But in the case at hand, where we consider them basic properties there is no way to account for the difference, except by referring to the brute fact that there are some laws that tells us that such particles behave in such a way. This would be much more implausible than the former explanation.

It would seem to me, that even those that think that objects have certain causal powers due not only to the properties they have but also to the laws of nature, should accept that once the laws of nature are fixed, then properties could be partly individuated by their causal powers. Once the laws of nature are fixed there should be no issue about the properties of an object if they had the same causal powers. That case should prompt us to think that the same properties are at work. But this brings us close to accept that commonalities of causal powers point to commonalities of physical constitution.

My claim here is not that these considerations are definitive but that they are highly plausible. But if we take them seriously, then the same argument that we applied to the causal view of properties is good enough for the present case. That the same causal powers, CP1, CP2 and CP3 point to the presence of a physical property P\*. And if so, reduction would be in the offing.

In light of such notion of realization it would seem that the reasons that lead us to do psychology are purely epistemic reasons.

Notice that whatever laws one would get from the property individuated by those causal powers it seems that they will be strict laws, or at any rate they will have the same precision and level of strictness of the physical law that subsumes the physical property that has those causal powers as a subset. So while the nonreductive physicalist

seems to regard mental properties and other special sciences properties as subsumed under *ceteris paribus* generalizations, on this proposal, they seem to enjoy the same level of precision of physical laws. And the reason for this seems to be that such proposal suggests, contrary to the intention of Shoemaker, that there is a physical property that unifies what we would have thought to be the province of the special sciences.

About (E), the view that the mental and the physical have the same set of causal powers, we can see that it suffers from all the problems that were faced by (D) but moreover falls prey to the view that natural properties are individuated by their causal powers. Here the nonreductive physicalist would have difficulties to even state the existence of mental properties, since they seem to be one and the same with the physical.

It seems then that those views that assume the numerical identity of the causal powers of the mental with those of the physical cannot give substance to the mental. It seems that the mental is, as John Heil (1999) puts it, “swallowed up by its realizers”(p194).

## CONCLUSION

It is interesting to note that proposals (A), (B) and (C) are proposals that understand the mental as emergent. Clarke’s proposal, that the causal powers of mental properties exceed those of the physical realizers seems either to lead to emergent properties that risk violating completeness, something that the nonreductive physicalist does not want and simultaneously it seems that the realizing relation is always somewhat incomplete since it is difficult to make sense of a property that is realized by another, that depends on it and ends up with causal powers not possessed by it. However it seems to me that it is only a view of this kind that can sustain the notion that mental properties are real causal properties consistent with distinction. Unfortunately, it is not a physicalist account.

View (D) and (E) and in particular Shoemaker’s proposal, with the idea that the causal powers of the mental are a proper subset of the causal power of the physical property that realize it in a system is unable to motivate against the charge that the realizer absorbs the mental

property. As such this view is unable to give a notion of realization that makes sense of the idea that mental properties are real causal properties. Though this view is thoroughly physicalist, its ontological claims do not suggest a reading of multiple realization that support the claim that the mental is distinct from the physical. On the contrary, it is plausible to think that such proposal seem to make the mental ripe for reduction.

So the nonreductive physicalist cannot object to premise (4). Our ontological scrutiny of overdetermination seems to point out that it does not make sense to suppose that there is overdetermination, supporting the original claim. As such we have to revise our supposition that mental properties are causal, or embrace emergentism, or adopt some version of type identity theory.

But the first claim, epiphenomenalism, is extremely unwelcoming to a nonreductive physicalist. After all, the reason that one might want to keep the mental with an ontological significance of its own might be to sustain and give sense to the causal explanatory potential of our mental life. But if the epiphenomenal road is taken, such motivation disappears.

While emergentism cannot be an alternative for the nonreductivist without giving up physicalism, identity, the last option, seems to be more appealing. Taking this road would end most of the problems that were expanded in this work.

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