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**Not Old . . . But Not That New Either:**  
Explicability, Emergence, and the Characterisation  
of Materialism

One popular way of formulating Materialism (or Physicalism – I do not distinguish) adopts the following procedure. First, define basic physical properties as those identified by a correct physics significantly resembling our own. We need the qualification ‘significantly resembling our own’ to avoid having to proclaim the truth of Materialism if physics takes a weird turn and holds that *sui generis* mental properties – e.g. the property of being psychon – are part of fundamental physical theory. Second, define broadly physical properties as either basic physical properties or properties related to basic physical properties in some distinctive fashion. The property of being a mountain would be a nice example of a nonbasic broadly physical property. Materialism is formulated as the claim that only broadly physical properties are instantiated in our world. Particulars are physical because they have only broadly physical properties.

What is the motivation for such an approach? The answer seems to be that it allows us to update our notion of matter by placing, at the heart of the definition, the science which is most concerned with its fundamental character: physics. It strikes me that this is a good motivation. Perhaps we can go one better and provide a characterisation of our idea of the physical for which there is no need for further updating, but perhaps not. If not, it would be good if we could be confident that a characterisation of Materialism of the kind I have just outlined is available. I shall argue that this is so.

Many have appealed to supervenience of one kind or another to characterise the relationship between broadly physical properties and basic physical properties (e.g. Haugeland 1982; early Horgan 1982; Jackson 1998, 12; early Kim 1984c, 156; Lewis 1983, 364). Some think this problematic, including some of the original proponents (late Horgan 1993a; late Kim 1993e). The debate proceeds as follows. Materialists identify

a supervenience relationship which would cover all varieties of Materialism but which would exclude theories incompatible with Materialism. The critics claim that, if merely this kind of supervenience is required (pick your favoured sort), it also holds between non-physical properties and basic physical properties and hence is not suitable for characterising Materialism.

In fact, they have asserted that, if Materialists restrict themselves to an appeal to supervenience alone, they will not be able to distinguish themselves from British Emergentism on the one hand and Ethical Nonnaturalism on the other. If they cannot, this is damaging for Materialism. British Emergentism (so-called because it was expounded by certain prominent British philosophers) is clearly not a species of Materialism since it postulates *sui generis* mental properties and fundamental emergent laws which relate them to complexes of physical properties. As its name suggests, Ethical Nonnaturalism does not seem compatible with Materialism either (Horgan 1993a, 557-560, 577-582; Loar 1992, 246-249; Schiffer 1987, 153-154). My aim is to deal with this challenge. I will argue that appeal to a certain kind of supervenience alone is sufficient.<sup>1</sup>

The most promising type of supervenience for our purposes is strong supervenience, formulated by Jaegwon Kim as follows.

*A strongly supervenes on B* just in case, necessarily, for each  $x$  and each property  $F$  in  $A$ , if  $x$  has  $F$ , then there is a property  $G$  in  $B$  such that  $x$  has  $G$ , and *necessarily* if any  $y$  has  $G$ , it has  $F$ . (Kim 1984c, 65)

That is:

$$\Box(\forall x)(\forall F)(Fx \wedge F_{\in A} \rightarrow (\exists G)(G_{\in B} \wedge Gx \wedge \Box(\forall y)(Gy \rightarrow Fy)))^2$$

Family  $A$  will be the family of broadly physical properties (including, and obviously of particular interest, mental properties). Family  $B$  will be the family of basic physical properties or conjunctions of basic physical properties. These may be quite complex and include environmental factors. If conjunctions of properties need not themselves be properties, then  $B$  should not be considered a family of *properties* but of *properties and*

<sup>1</sup> The challenge does not just afflict supervenience definitions of Materialism. It also afflicts a related proposal by Robert Kirk, the *Strict Implication Thesis* (Kirk 1996, 2001). I mention this in passing. I shall not explicitly discuss Kirk's proposal. However, I believe that he could make similar manoeuvres to the ones I outline below.

<sup>2</sup> Where  $A$  and  $B$  are families of properties, the supervening and supervenience-base (or subvenient) properties respectively, and ' $\Box$ ' is the necessity operator with a force to be specified.

*their conjunctions*. This qualification is necessary to deal with the fact that the instantiation of mental properties may be *determined* by basic physical properties without there being a basic physical property of some sort or another responsible for each instantiation of mental properties.<sup>3</sup> This notion of determination is the intuitive idea which supervenience of one kind or another is seeking to articulate.

The central issue concerns the appropriate characterisation of the two occurrences of the modal operator ‘necessarily’ in the formulation given and, in particular, the second. The first modal operator is plausibly viewed as that of *nomological* necessity. The claim is to be read as asserting that, in all possible worlds whose laws of nature are identical to our laws, there will be subvening basic physical properties for every broadly physical property. This allows for the contingency of Materialism. There might be worlds with rather different laws in which there are no subvening basic physical properties and perhaps no properties subvening mental properties at all: worlds entirely populated by spirits.

The presence of the second operator distinguishes strong supervenience from weak supervenience. Two possible interpretations of it have been seriously entertained: metaphysical and nomological necessity. If the first is adopted, basic physical properties (or their conjunctions) *metaphysically necessitate* broadly physical properties, if the second, basic physical properties (or their conjunctions) *nomologically necessitate* broadly physical properties. Given the choice we have made regarding the interpretation of the first modal operator, these options remain in play in the face of an objection to the contrary. Some have argued that interpreting the second modal operator as that of metaphysical necessity is incompatible with the contingency of Materialism (Seager 1988, 701-702). Not so. Instantiations of basic physical properties metaphysically necessitate instantiations of mental properties even if there are some worlds in which nonphysical properties metaphysically necessitate mental properties too. Nor is the Materialist committed to ruling out such worlds given that the first modal operator is interpreted to be that of nomological necessity. Yes, in the world considered, there will be nonphysical subvening properties. However, in that world, the laws will be different. They will include laws concerning the nonphysical properties. All the Materialist is committed to ruling out is that there may be other subvening properties (or none at all) when the laws are the same. What if there are no laws governing the nonphysical properties envisaged? If this is possible,

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<sup>3</sup> Kim himself takes *B* to be the family of basic physical properties closed under boolean operations. An unfortunate consequence of this is that the property of having no mass becomes a physical property (Post 1984, 165; Seager 1988, 698). My limitation seems more appropriate.

we would need to adjust the necessity of the first modal operator. It would limit the worlds considered to those with the same laws *and properties* or to worlds which are minimal physical duplicates (Jackson 1998, 12; Lewis 1983, 364).<sup>4</sup> It is hard to believe that minor adjustments of this sort would undermine the basic idea that taking the second modal operator to be that of metaphysical necessity is compatible with the contingency of Materialism.

The conclusion at which I have just arrived is welcome. I shall argue that Materialists must claim that the second modal operator is that of *metaphysical* necessity. If they did not, there really would be no way of distinguishing Materialism from British Emergentism.<sup>5</sup> However, once they have made this move, that is all they need. There is no need to appeal to any additional notion, in particular, to the one advanced by a growing number of philosophers, namely that, if Materialism is true, all properties are *explicable* in terms of basic physical properties (Cussins 1992, 204-205; Horgan 1993a, 557-560; Kim 1993e, 343-344; LePore & Loewer 1989, 177-178).

John Heil would probably disagree. He argues that those who are interested in serious metaphysics should be interested in the explication of supervenience relations (Heil 1998, 150-154). Now I am as interested in the explication of supervenience relations as the next person. However, I do not think we should allow such preoccupations to distort our formulation of Materialism. The point of providing a characterisation of Materialism in terms of a certain kind of supervenience is to pick out the class of relations between basic physical properties and others distinctive of Materialism. There will be various types of relations, many of which involve their own kind of explication (as we shall see). The proper formulation of Materialism does not involve singling out what kinds of explication are involved. Nor should it appeal to the idea of explicability unless it does some useful work. My claim will be that it does not.

The argument will proceed as follows. First, I shall focus on British Emergentism. When we have the doctrine in view, it will become clear why we should not take the second modal operator in our formulation of Materialism as merely nomological necessity. It will also become clear why people have been tempted to appeal to the notion of explicability. I argue that explicability implies metaphysical necessitation and

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<sup>4</sup> Suppose that there is a possible world in which, along with basic physical properties, and the mental properties realised by them, there are unrealised mental properties which do not figure in laws. Such a world would not differ in properties or laws from our world. The limitation to minimal physical duplicates would deal with this case.

<sup>5</sup> The same move serves to distinguish Materialism from Parallelism and other forms of Dualism.

has nothing, in addition, to add. This approach appears threatened by the proper formulation of Ethical Nonnaturalism since, as we shall see, it should be formulated in terms of metaphysical necessitation, too; yet it is supposed to be incompatible with Materialism. But, I argue that appearances are deceptive. Ethical Nonnaturalism is compatible with Materialism. Hence there is no problem with both Ethical Nonnaturalism and Materialism appealing to the same kind of supervenience relation. I then go on to consider the claim that Materialism formulated in my favoured way does not capture the asymmetric dependence of the broadly physical on the physical. I agree. It does not. But, I argue, this does not undermine the formulation. I close by considering the claim that my formulation fails to capture certain other distinctive features of Materialism, for instance, that the only basic causal properties are basic physical properties and that the only fundamental laws are the laws of physics. I present a dilemma: understand ‘fundamental’ one way and my proposal captures the idea; understand it another way and it is not essential to the proper characterisation of Materialism.

### 1. *British Emergentism and Materialism*

British Emergentists such as Samuel Alexander hold that, as we might put it, the physical supervenience-bases of mental properties nomologically necessitate mental properties whose character is different from that of physical properties and which have novel causal powers (Alexander 1920, 6-7 & 45-47). In his own words, Alexander writes:

The higher quality emerges from the lower level of existence and has its roots therein, but it emerges therefrom, and it does not belong to that lower level, but constitutes its possessor a new order of existent with its special laws of behaviour. The existence of emergent qualities thus described is something to be noted, as some would say, under the compulsion of brute empirical fact, or, as I should prefer to say in less harsh terms, to be accepted with the natural ‘piety’ of the investigator. It admits of no explanation. (Alexander 1920, 46-47)

British Emergentism is different from what C.D. Broad, another British Emergentist, has called Substantial Mentalism. The Substantial Mentalist holds that configurations of matter bring forth a new kind of thing – ‘entelechy’ – which is distinct from the configurations of matter and which possesses nonphysical properties. British Emergentists eschew the thing but keep the properties (Broad 1925, 56-58; Kim 1992b, 123-124).

When reading the work of British Emergentists, it is easy to see how appealing to explicability is tempting to those who want to distinguish British Emergentism from Materialism. Explicability seems to be just what British Emergentists deny. But talk of inexplicability is an attempt to characterise what makes the instantiation of a property an *emergent effect*. Our understanding of the proper formulation of Materialism will advance if we consider in a bit more detail what this means.

In confronting the issue, there is a basic dilemma. If we are not careful, we can make it either a trivial matter that there are emergent effects or impossible. Suppose that there are a number of component causes  $c_1, c_2, c_3, \dots, c_n$  of an effect  $e$  and let  $e_1$  be the effect of  $c_1$ ,  $e_2$  the effect of  $c_2$ ,  $\dots$ ,  $e_n$  the effect of  $c_n$ , if  $c_i$  is acting without the other component causes in otherwise similar circumstances (where  $c_i \neq c_j$  and  $e \neq e_i \neq e_j$ ). A trivialising account of emergent effects would run as follows.

- (EE1) An effect  $e$  is an emergent effect of  $c_1, c_2, c_3, \dots, c_n$  iff  $e \neq e_1 + e_2 + \dots + e_n$  (where  $e_i$  is an effect of  $c_i$ , independently of all the other component causes).

Most effects would be emergent so defined. Forces may act together by the parallel law of vector addition but we do not think that the causal powers of water are just the sum of the independent powers of hydrogen and oxygen. Water puts out fires. Hydrogen and oxygen do not. By contrast, the following account would make emergent effects impossible.

- (EE2) An effect  $e$  is emergent iff it cannot be predicted with full knowledge of the component causes.

But part of full knowledge of the component causes will be just that they interact to produce  $e$ , in which case nothing would come out as an emergent effect (Hempel & Oppenheim 1948, 260).

A more plausible approach is to be found by focussing on the distinction between fundamental and derivative laws. Let  $S(C_1, C_2, C_3, \dots, C_n)$  be a complex property of  $c_1, c_2, c_3, \dots, c_n$  collectively (where  $C_i$  is a property of  $c_i$ ). Part of  $S(\dots)$ 's character may include the pattern of instantiation of properties in the collective  $c_1, c_2, c_3, \dots, c_n$ . If there is a fundamental law relating  $S(C_1, C_2, C_3, \dots, C_n)$  to  $E$ , an essential property of  $e$ ,  $e$  is an emergent effect of  $c_1, c_2, c_3, \dots, c_n$ . Because  $E$  is an essential property of  $e$ ,  $c_1, c_2, c_3, \dots, c_n$  cause  $e$  to exist, rather than just affect it by bringing about its possession of  $E$  (Mellor 1995, 140-142). If the law is derivative, then the effect is not emergent. To characterise it, as I did the other proposals, my suggestion is the following:

- (EE3) An effect  $e$  is an emergent effect of an instance of  $S(C_1, C_2, C_3, \dots C_n)$  iff the law relating instances of  $S(C_1, C_2, C_3, \dots C_n)$  to  $e$  is a fundamental law.

What makes a law *derivative* rather than *fundamental*? Here are some cases. All of them attempt to characterise how a law would be derivative relative to the laws governing basic physical properties.

- (D1) *Determinate Laws*:  $S(C_1, C_2, C_3, \dots C_n)$  and  $E$  are determinates of determinable basic physical properties for which there is a corresponding law which does not just hold for properties of type  $S(C_1, C_2, C_3, \dots C_n)$  and  $E$ . The particular law relating  $S(C_1, C_2, C_3, \dots C_n)$  and  $E$  is a consequence of this more general law and identity statements claiming that these two kinds are determinates of the determinables mentioned (Broad 1925, 65). For instance, the mass of a table is not an emergent property of the mass of its parts because mass is a basic physical property.
- (D2) *Compound Laws*:  $S(C_1, C_2, C_3, \dots C_n)$  and  $E$  are conjunctions of basic physical properties  $F \& H$  and  $I \& G$ , respectively, and there are basic physical laws, one relating  $F$  and  $I$  and the other relating  $H$  and  $G$ , from which it would follow that there is a law relating  $F \& H$  with  $I \& G$  (Broad 1925, 65).
- (D3) *Disjunctive Laws*:  $S(C_1, C_2, C_3, \dots C_n)$  and  $E$  are disjunctions of basic physical properties,  $A \vee B \vee C$  and  $Q \vee R \vee S$ , respectively, and there are laws relating  $A$  to  $Q$ ,  $B$  to  $R$ , and  $C$  to  $S$ , from which it would follow that there is a law relating  $S(C_1, C_2, C_3, \dots C_n)$  to  $E$ . This is the kind of case Fodor seemed to have in mind when talking of special science laws (Fodor 1974).
- (D4) *Functional Laws*:  $S(C_1, C_2, C_3, \dots C_n)$  characterises circumstances in which the instantiation of a basic physical property  $F$  has the potential for being causally related to instances of basic physical properties  $G, H, I$ , given the instantiation of  $J, K$  and  $L$ , respectively.  $E$  is a causal role property  $R$  possessed by something – in this case the instantiation of a property – if it has the potential just described. The law between  $S(C_1, C_2, C_3, \dots C_n)$  and  $E$  would be a derivative from the laws governing the causal relationships between the basic physical properties.
- (D5) *Structural Laws*:  $S(C_1, C_2, C_3, \dots C_n)$  involves the instantiation of basic physical properties, say  $F, G, H$  and  $I$ , at particular spatiotemporal locations, say  $st_1, st_2, st_3$ , and  $st_4$ , respectively.  $E$  is a structural property. For instance,  $F, G, H$ , and  $I$  may be strips of colour and  $E$  the property of being striped. The connection between

$S(C_1, C_2, C_3, \dots C_n)$  and  $E$  is governed by the laws constituting the geometrical structure of spacetime. It may well be that (D5) is a special case of (D1).

- (D6) *Hybrid Cases*: There may be cases which involve a mixture of the types of cases discussed above. A good example of this would be liquidity. It is plausibly thought of as causal role property in that things with this property have the capacity to flow, and not keep their shape, but, unlike a gas, liquids are not easily compressible. Liquidity is also plausibly thought of as a structural property characterised in terms of the disordered character of the molecules that make it up and the weak bonds between them. One hypothesis would be that liquidity is a certain kind of structural property which plays a certain causal role. In which case the supervenience base of liquidity would include basic physical properties, laws governing their interactions and laws constituting the geometrical structure of spacetime.

Some might contest whether these putative laws are laws at all. Instead they are statements of these relationships made true by fundamental laws (from which they are derived). Upon this view, there are only fundamental laws. Whether or not this is the right way of looking at things does not matter for my present purposes. What is clear is that the laws identified above are not fundamental laws. The important point is that the cases share a distinctive feature. Each suggests that instances of basic physical properties taken together, and perhaps along with the laws which govern them, metaphysically necessitate the non-emergent effects.

This is obvious in the case of compound laws and disjunctive laws. If  $E$  is a conjunction of basic physical properties or a disjunction of basic physical properties, then the instantiation of these basic physical properties will metaphysically necessitate an instance of  $E$ . In the case of functional laws, if the supervenience-base includes both the basic physical properties and the laws which govern them, then the supervenience-base metaphysically necessitates the instantiation of  $E$ . There is no possible world in which  $E$ , understood to be a causal role property, would fail to be instantiated given that the constituents of the supervenience-base were instantiated. In the case of determinate laws, if  $E$  is a determinate of a determinable basic physical property, then there is no question that it is metaphysically necessitated by a basic physical property. It *is* a basic physical property and, hence, trivially metaphysically necessitates itself. The case of structural laws may well be an instance of the same point. However, we may also note that these structural laws should be part of the supervenience-base of  $E$  since they serve to characterise the



very spacetime that enables  $F$ ,  $G$ ,  $H$  and  $I$  to be located at  $st_1$ ,  $st_2$ ,  $st_3$ , and  $st_4$ . Once this is fixed, it is metaphysically necessary that  $E$  is instantiated.

The cases described above may not be exhaustive but they do suggest that metaphysical necessitation may be a hallmark of Materialism, in which case we have a demarcation between Materialism and British Emergentism: the former must interpret the modal operator as that of metaphysical necessity; the latter should insist it is only that of nomological necessity (I am not alone in this opinion, see Van Cleve 1990, 222). The appeal to metaphysical necessity arose out of the attempt to make sense of the distinction between emergent or inexplicable effects and nonemergent or explicable effects. So it is justified by precisely the issues which motivated some to appeal to explicability in the first place to characterise Materialism.

Let me consider a few preliminary reservations which might be entertained. The first is that, in the case of two kinds of putative derivative laws – functional and structural laws – I suggested that laws should figure in the supervenience-base of the nonemergent effects. It could be argued that this just fixes things the way I want. Even British Emergentism could be characterised in terms of metaphysical necessitation if we put the fundamental psychophysical laws in the supervenience-base of mental properties. I do not deny that British Emergentism could be characterised in this way, but the crucial difference is that the laws I put in the supervenience-base were not laws which specifically related properties of kind  $S(C_1, C_2, C_3, \dots C_n)$  with  $E$ . My claim is that Materialism is committed to holding that basic physical properties plus the laws which govern them metaphysically necessitate mental properties.

A second reservation is that contrary to appearances, the connection between basic physical properties and broadly physical properties cannot be one of metaphysical necessitation because the connection can always be broken by the instantiation of some other property. The right response to this concern is just to say that all this would reveal is that the supervenience-base ought to be extended to include circumstances that rule out the instantiation of properties that might break the connection. This extended supervenience-base would metaphysically necessitate mental properties.

There are other reservations to consider of course. However, I will discuss them in the next two sections.

## 2. *Ethical Nonnaturalism*

As I already noted, the case of Moore's Ethical Nonnaturalism presents a *prima facie* difficulty for my proposal. Moore cannot be interpreted as

holding that there is merely nomological necessitation between the moral and the natural. To fix ideas, I will assume that this means that he also does not hold that there is merely a nomological relationship between moral properties and *basic physical properties* (a subclass of the natural). The assumption favours the opposition.

There are various points at which Moore makes his view on the matter clear. One is implicit: he thinks that the best way to assess the intrinsic value of an object is *via* an isolation test. He writes: “it is necessary to consider what things are such that, if they existed *by themselves*, in absolute isolation, we should yet judge their existence to be good” (Moore 1903, 187). He does not seem to countenance the possibility that, if we considered things in isolation, laws relating basic physical properties with intrinsic properties might be different and hence they might no longer have the value they had in company. He is more explicit in the following passage:

Suppose you take a particular patch of colour, which is yellow. We can, I think, say with certainty that any patch exactly like that one, *would* be yellow, even if it existed in a Universe in which causal laws were quite different from what they are in this one. We can say that any such patch *must* be yellow, quite unconditionally, whatever the circumstances, and whatever the causal laws. And it is in a sense similar to this, in respect of the fact that it is neither empirical nor causal, that I mean the ‘must’ to be understood, when I say that if a kind of value is to be ‘intrinsic,’ then supposing a given thing possesses it in a certain degree, anything exactly like that thing *must* possess it in exactly the same degree. (Moore 1922, 269)

Moore does not think that intrinsic values are properties at all. Nevertheless, he holds that the truth of our ascriptions of predicates of value is metaphysically necessitated by the intrinsic basic physical properties of the thing valued (Moore 1922, 273-275). The problem for my proposal appears to be this. Either I have to claim that Moore provided the wrong characterisation of the relationship between basic physical properties and value ascriptions, or I have to accept that the metaphysical necessitation of one set of properties by another is quite compatible with the properties being very different. But if that were so, metaphysical necessitation would not flesh out the idea that all the properties instantiated in our world resemble, or are entirely constituted from, the kind of properties identified by physics: the distinctive credo of Materialism.

Naturally I want to steer between the horns of this dilemma and to do so it is helpful to look at Moore’s attempts to characterise nonnatural

properties, since it is only because 'nonnatural' gives rise to the impression that we have something of a very different nature that the problem I outlined arises in the first place.

I think it is fair to say that Moore struggles to give proper sense to the notion of 'nonnatural.' His first attempt to characterise it was as something that could not be instantiated independently in time (Moore 1903, 41). He later rejected this idea as preposterous on the grounds that it would make colours nonnatural properties (Moore 1942, 581-582). We do not need to dwell too much on this suggestion except to note in passing that the Materialist is by no means committed to asserting that mental properties could be instantiated independently in time. So to that extent, the Materialist would allow that mental properties may be nonnatural too.

Moore's more considered attempt to characterise the nonnatural, pre-figured in his paper on intrinsic value and endorsed in his response to critics, is as follows (Moore 1922, 272-275; 1942, 590-592). An ascription of an intrinsic value to an object is an ascription of something nonnatural because it is not in any sense *descriptive* of the object whereas ascribing an (intrinsic) natural property to an object is descriptive. As Moore recognises, one development of this idea seems to be that evaluative predicates play some other function. They do not describe evaluative properties because there are no such things. Moore is drawn to this suggestion. He writes:

I must say again that I am inclined to think that 'right,' in all ethical uses, and, of course 'wrong,' 'ought,' 'duty' also, are, in this radical sense, not the names of characteristics at all, that they have merely 'emotive meaning' and no 'cognitive meaning' at all: and, if this is true of them, it must also be true of 'good,' in the sense I have been most concerned with. (Moore 1942, 554)

If he took it up, Moore's position would be no further threat because it would be radically altered. The account of Materialism I have provided concerns a relationship between properties, not the relationship between properties and the legitimacy of certain nondescriptive ascriptions. The fact that metaphysical necessitation might figure in the latter does not undermine the implications I have sought to establish for it in characterising an ontological relationship between properties.

Although he flirts with it, Moore does not end up endorsing the claim that evaluative predicates have merely emotive meaning. He writes:

I am *inclined* to think that this is so, but I am also inclined to think that it is not so; and I do not know which way I am inclined most strongly. (Moore 1942, 554)

So he is prepared to allow that there is some sense in which evaluative predicates still describe.

But then we need an account of what makes a property nonnatural. Moore pursues the issue further when he explains why he is not prepared to identify evaluative properties with natural properties. The first thing he acknowledges is that it is an implication of his views that natural properties are action-guiding or ought-implying. They have this practical dimension because they metaphysically necessitate certain evaluative properties. Strangely, he does not take this fact as threatening their natural status (Moore 1942, 603). This gives rise to the suspicion that his conception of nonnatural is rather weaker than we might initially expect. The suspicion is reinforced by his actual reason for denying that evaluative properties are natural.

... [This reason] consists of two propositions (1) that there are an immense number of different natural intrinsic properties, all of which are 'ought implying,' and (2) that there does not seem to be any natural intrinsic property, other than (possibly) the disjunction of them all, which is *both* entailed by them all and also 'ought implying.' Now intrinsic value, of course, cannot be identical with each of a number of different natural intrinsic properties; and yet it is entailed by each of them. But it is certainly not identical with a disjunction of them all, even if there is such a disjunction; and if the number is infinite, as it well may be, there is no disjunction. (Moore 1942, 605)

The answer he gives is a reason Nonreductive Materialists typically give for denying that mental properties are identical with basic physical properties. Thus the fact that Moore chose to appeal to metaphysical necessitation in characterising his Ethical Nonnaturalism does not indicate it is inappropriate to describe Materialism in this way. By Moore's lights, the Nonreductive Materialist would hold that mental properties are non-natural.

Those who wish to argue that the proper formulation of Ethical Non-naturalism presents a problem for my proposal must therefore do two things. First, they must establish that, even if mental properties are broadly physical properties, there is no question of evaluative properties being broadly physical properties. Second, they must defend the claim that it is appropriate to characterise the relationship between basic physical properties and evaluative properties by appeal to metaphysical necessitation. It is by no means clear that they can satisfy both conditions as our examination of Moore's writings revealed.

### 3. *Explication and Asymmetry*

Let me now turn to the most substantial obstacle facing my proposal, the feeling that it cannot capture the distinctive nature of Materialism because it does not capture the fact that broadly physical properties are *asymmetrically dependent* upon basic physical properties (broadly physical properties are constituted from basic physical properties and not the other way around).

Initially it might seem that it is reasonably easy for my proposal to be developed into an account which captures the appropriate asymmetry. Let *N-M* strong supervenience be strong supervenience with the first modal operator understood in terms of nomological necessity and the second in terms of metaphysical necessity. Then we might characterise Materialism as follows:

- (a) Every property instantiated in our world N-M strongly supervenes upon basic physical properties or conjunctions of the same.  
(*my proposal so far*)

plus

- (b) It is not the case that every property instantiated in our world N-M strongly supervenes upon another class of properties (given that class does not contain the class of basic physical properties and their conjunctions).

Unfortunately, this proposal will not work. Richard Miller has argued that the class of morally significant properties would falsify the second clause since they can be just as exhaustive as basic physical properties. Anything is a morally significant property since it has the capacity to make a moral difference. The instantiation of one basic physical property in the wrong place may have catastrophic consequences. It could stimulate a mad despot to fire all his or her nuclear weapons on hearing the news. It is only because we have a crude understanding of the nature of morally significant properties that we would say otherwise. Hence, if everything N-M strongly supervenes on basic physical properties, they N-M strongly supervene upon morally significant properties (Miller 1990, 695-701, esp. 699-700). Yet morally significant properties are not identical to basic physical properties. The former cannot be instantiated in a world without living creatures. So we do not just have another way of describing basic physical properties.

One response has been to cite exactly the dependence on living creatures to avoid the conclusion. Basic physical properties, themselves, cannot supervene upon morally significant properties because there will be

worlds in which there are no life forms and hence no moral significance and yet there will still be basic physical properties (Hellman 1992, 44-45).<sup>6</sup> This response will not work as a defence of the proposal above, because this proposal limits the worlds we should consider to worlds with the same laws (and more, if we take the qualifications I mentioned at the beginning seriously). It is a reasonable assumption that these worlds will have life forms. So there will be morally significant differences corresponding to differences in basic physical properties.

A better response begins by considering the status of morally significant properties. Suppose they do not N-M strongly supervene upon basic physical properties. In that case, according to my proposal, Materialism is false. The first clause in the above account would not be met. On the other hand, suppose that morally significant properties do N-M supervene upon basic physical properties. Then, according to my proposal, they present no problem for Materialism. This seems intuitively right. After all, we just characterised them as common or garden broadly physical properties which had an impact on life forms of some kind or another. Given that there is no problem for Materialism about life, and conscious life in particular, there will be no problem about morally significant properties so characterised. They do not introduce anything new. Yet clause (b) would proclaim that Materialism is false because now we would have another set of properties upon which every property N-M supervenes. This suggests that we should not develop my proposal by adding (b). The mistake has been to assume that, in order to provide a proper characterisation of Materialism, we must show how basic physical properties are fundamental by being the sole properties upon which everything supervenes. But we do not need to show this. Of course, we can capture the fact that basic physical properties are of fundamental importance in characterising Materialism by noting that, in worlds where there are no basic physical properties and yet there are morally significant properties, Materialism will be false. But this is a distinct matter from saying that basic physical properties are the fundamental constituents in our world. Such a claim is not needed to determine whether something is broadly physical.

It has been argued that we cannot afford to adopt a formulation of Materialism that does not express the fact that basic physical properties are the fundamental supervenience-base (Jack 1994, 439-440). Suppose that Neutral Monism is true: the world is made out of stuff which is neither

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<sup>6</sup> I should remark that I am in general agreement with the details of Hellman's criticism of some of Miller's arguments. Nevertheless, the general point Miller makes seems to me to remain as a challenge.

physical nor nonphysical. The Neutral Monist will claim that basic physical properties N-M strongly supervene upon neutral properties. Suppose further that mental properties will N-M strongly supervene upon basic physical properties. We would not, the line of thought runs, hold that mental properties were broadly physical. The N-M strong supervenience of the basic physical properties on neutral properties puts the lie to that.

However, the reason why such a world would not count as Materialist is that neutral properties do not N-M strongly supervene upon basic physical properties. If they did, then they would not have features which are neither physical nor mental. But by hypothesis they do (e.g. Jack 1994, 439). So our formulation of Materialism does not have to change. We do need to make a slight adjustment to our definition of broadly physical properties to take into account the consideration just mentioned. We should just insist that a property *P* is a broadly physical property iff *P* strongly N-M supervenes upon basic physical properties and anything else upon which it strongly N-M supervenes also strongly N-M supervenes upon basic physical properties.

Some Neutral Monists hold that when we experience the world, we experience the intrinsic character of certain properties of the world – those of certain states of our brain – which are inaccessible to physics and the other sciences. The sciences only provide us with a characterisation of the nature of the world in terms of causal potentialities and not in terms of its intrinsic stuff. According to such a view, these intrinsic properties would not N-M strongly supervene upon basic physical properties because it is not true that basic physical properties metaphysically necessitate one intrinsic property over another. As one proponent remarks:

[S]uch a theory represents the physical world as infused with intrinsic qualities which, in conjunction with natural laws, constitute the basis of its causal powers . . . (Lockwood 1989, 159)

In other words, in worlds where the laws are different, the same intrinsic property can be related to a different causal potentiality. If all Neutral Monism took this form, the revision I have just made would not be necessary.

Another way of expressing the worry that N-M strong supervenience does not provide a proper characterisation of Materialism concerns the case of necessary facts. Basic physical facts metaphysically necessitate necessary facts such as  $2 + 2 = 4$ . Yet, the worry runs, we do not suppose that this establishes that necessary facts are broadly physical facts. The diagnosis of the problem is that metaphysical necessitation does not imply constitution and it is the latter notion we need (Pettit 1995, 144-

146). However, this is too quick. On the one hand, it is open to some to claim that the metaphysical necessitation of necessary facts by physical facts (or, indeed, any other contingent facts), shows that there is no more to necessary facts than these contingent facts. If that were right, then there would be nothing wrong with characterising the Materialist thought that mental properties are nothing over and above physical properties by the idea of N-M supervenience. On the other hand, suppose you think that the metaphysical necessitation of necessary facts by basic physical facts reveals nothing about the character of necessary facts. The most plausible reason for this claim is the very fact that necessary facts are necessary. They hold true regardless of what is going on contingently. Any contingent fact metaphysically necessitates necessary facts. But, if that is right, then we have a point of difference with putative broadly physical properties. Because they are not necessarily instantiated in every possible world, they are not metaphysically necessitated by any set of contingently instantiated properties. Their metaphysical necessitation by some contingently instantiated properties rather than other contingently instantiated properties shows something about their nature. In which case my proposal should just include the restriction that the supervening properties must be contingently instantiated.

A third way of expressing the worry that appeal to N-M strong supervenience is insufficient to characterise Materialism is to claim that it cannot be ruled out that God prescribes two radically different properties from being necessarily co-extensive. By divine will, he holds them together. In which case, Materialism would be false but the characterisation in terms of N-M supervenience would be satisfied. There are two possible responses. The first is to argue that God cannot falsify necessary truths. If two properties, *F* and *G*, are radically different, then, if God had not stepped in, it would have been possible that one property can be instantiated without the other. If it is possible that *F* is instantiated without *G* or *G* without *F*, then it is necessary that it is possible that *F* is instantiated without *G* or *G* without *F* (by S5 modal logic). So, if God were to ensure that they are necessarily coextensive, he would falsify what would otherwise have been a necessary truth. In other words, he would have falsified a necessary truth in the same sense that he would have if he made  $2 + 2 = 5$ . Of course, given he has stepped in,  $2 + 2 = 4$  is not a necessary truth, it only would have been. But that just goes to show the attendant difficulties in describing coherently what God cannot do here.

The success of this response rests upon the plausibility of the claim that God cannot falsify necessary truths of this type. This in turn rests upon questions concerning the power of God and whether he is a necessary existent. I assume that this means that there are reasonable grounds



for optimism for the response. Nevertheless, if it should turn out otherwise, there is an alternative. It is simply to relativise my formulation to metaphysical necessitation unmediated by God.

Let me close the discussion of this section by commenting on two related issues which might be thought to have implications for my approach. The first is that I do not have to deny that all metaphysically necessary truths are *a priori*; for instance, I am not committed to resisting the picture of modality favoured by David Chalmers and Frank Jackson (Chalmers 1996, 56-71; Jackson 1998, 56-86). My point is just that we only need to appeal to N-M supervenience in formulating Materialism. If this implies intelligibility or explicability between basic physical properties and the rest, so be it. It is the opponent who denies such an implication.

The second issue needs a little more discussion. Ralph Wedgwood has argued recently that, in contrast to the Reductive Materialist (and he includes Functionalism as a version of Reductive Materialism), the Nonreductive Materialist is committed to there being a large number of *independent* necessary truths, relating physical properties to a particular mental property (Wedgwood 2000, 400-402). Wedgwood provides a model for how the Nonreductive Materialist's necessary truths may be explained which he claims deals with the difficulty so long as we abandon S5.

If he is right that S5 must go, then my first response to the objection from God falls because I appealed to an inference only allowed in S5. But I do not think he is right. I am not going to challenge his claim that the independent necessary truths should be explained. The purpose of my paper is not to deny the connection between metaphysical necessitation and explicability but to claim that no independent appeal to explicability is needed. Rather, the problem with Wedgwood's position is that the model he adopts to explain the independent necessary truths to which the Nonreductive Materialist is alleged to be committed fails to reduce the number of independent necessary truths we need to explain. If that is right, then his position deserves no defence by the rejection of S5. It is already flawed.

His proposal runs as follows. We should explain

Metaphysically necessarily, for all individuals  $x$ , if  $x$  has basic physical property  $P$  (for a vast array of  $P$ ), then  $x$  is in pain.

in terms of the following two claims:

*Nomological regularity*: For all individuals  $x$ , if  $x$  has basic physical property  $P$ , and is 'wired up' in the way typical of human beings, then  $x$  is in pain.

*Fundamental Necessary Truth about Pain:* For all possible worlds  $v$ , and all individuals  $x$ , if  $x$  is in pain in  $v$ , then for some physical property  $P$ ,  $x$  has  $P$  in  $v$ , and it is a basic nomological regularity in  $v$  that anything that has  $P$  is in pain, and, for all worlds  $w$  that are possible relative to  $v$ , and broadly similar physical laws and boundary conditions to  $v$ , any such basic nomological regularity holds in  $v$  iff it holds in  $w$ . (Wedgwood 2000, 407-408)

Wedgwood rejects S5 because otherwise he would have been open to the objection that we would need to explain the multifold of necessary truths concerning how different laws and boundary conditions would give rise to nomological regularities between physical properties and mental properties. It enables him to deny that, if it were possible that there are such necessary truths in other worlds with different laws, then it would be a necessary truth in our world in need of explanation (Wedgwood 2000, 410). It would not need explanation because it would not hold if S5 is rejected.

Although he avoids the need for these explanations, his proposal does not serve to reduce the original number of independent necessary truths. In effect, Wedgwood claims that it is a fundamental necessary truth that all the nomological regularities which govern the relationship between basic physical properties and pain hold in all possible worlds with physical laws and boundary conditions broadly similar to those in our world. But all he seems to have done is replace a load of metaphysically necessary truths of the form

Metaphysically necessarily, for all individuals  $x$ , if  $x$  has basic physical property  $P$ , then  $x$  is in pain.

with ones of the form

Metaphysically necessarily, if the physical laws and boundary conditions of a world are such and such, then the following nomological regularity holds: For all  $x$ , if  $x$  has  $P$  and is wired up appropriately, then  $x$  is in pain (for various substitutions for  $P$ ).

Now if the necessary truths concerning the relationship between basic physical properties and mental properties are independent, I do not see how the necessary truths relating physical laws and boundary conditions with a nomological regularity concerning these mental properties could fail to be independent. If there is no systematic relationship for the first lot, there will not be a systematic relationship for the second lot. For

each different  $P$ , there will be an independent necessary truth relating laws plus boundary conditions with the nomological regularity involving it. The nonreductive character of pain implies a nonreductive character to the very laws that Wedgwood presses into service to provide the explanation.

#### 4. *Causation and the Proper Characterisation of Materialism*

I have suggested that the proper characterisation of Materialism can be given by the claim that every property strongly N-M supervenes upon basic physical properties. The underlying intuition I have pressed is that Materialists are primarily interested in whether mental properties are of a fundamentally different kind to basic physical properties. I imagine that some will still feel concerned that I have not done justice to the following two claims often held to be distinctive of Materialism.

- (M1) All properties are constituted from basic physical properties (e.g. Charles 1992, 274; Pettit 1993).
- (M2) Basic physical properties are causally or explanatorily fundamental (Charles 1992, 274-276; LePore & Loewer 1989, 177-178; Pettit 1993, 219-220).

To an extent, I do not care until I am provided with a world in which one or both of (M1) and (M2) are false, my proposal pronounces Materialism to hold and yet we feel that this is wrong. However, let me take the fight to the opposition.

If every property strongly N-M supervenes on basic physical properties, that strongly suggests that basic physical properties constitute all other properties. Of course, by the same token, morally significant properties constitute all other properties too. However, I think it would be a mistake to suppose we must reach a different conclusion (given, for the sake of argument, that we accepted that everything is morally significant). Rather, the point is that we do not think that moral significance is the right way to characterise the basic constituents of the world. But then we should appeal to the character of physical theories and the basic physical properties they identify to capture this point. Constitution drops out.

The claim that my proposal fails to capture (M2) is more difficult to assess. There are a number of points that need to be made. The interpretation of (M2) is not clear. Some hold that it amounts to the following:

*Causal Inheritance Principle:* If  $M$  is instantiated on a given occasion by being realised by  $P$ , then the causal powers of *this instance of  $M$*  are identical with (perhaps a subset of) the causal powers of  $P$ . (Kim 1993b, 355; emphasis original)

If this characterisation of causal inheritance is correct, then my proposal does not flout this principle. However, it is worth noting that the principle is poorly named. There is nothing in it which suggests that the basic physical properties do not inherit some of their causal powers from the fact that they metaphysically necessitate mental properties which have these causal powers. It is also not obvious that the principle is true. Mental properties, and indeed all other variably realised properties, may have causal powers which are plausibly thought to outstrip those of their realisers. For instance, if pain is realised in carbon-based life forms and silicon-based life forms and gives rise to the appropriate behaviour in each, then pain has distinctive carbon effects and silicon effects. By contrast, the realisers – a carbon structural property or a silicon structural property – will not have both kinds of effects. This point is compatible with saying that a particular *instance* of a mental property has the causal powers of its realiser alone. However, this choice of description needs to be defended. In the absence of a successful defence, the principle is in doubt (for further discussion see Noordhof 1997, 245-247; 1999, 113-114).<sup>7</sup>

Those who suppose that (M2) expresses an important commitment to Materialism need a better way of capturing the point. One thought is that the following expresses what they have in mind.

(M3) The laws of physics are fundamental.

However, now there is a dilemma. On the one hand, there is a clear sense in which my proposal can capture the claim that the laws of physics are fundamental. Given that all properties strongly N-M supervene upon basic physical properties, generalisations about basic physical properties are the simplest set of generalisations providing complete coverage. They enable us to arrive at predictions about any instantiations of properties in this world. If that is all that is meant, there is no problem for my proposal.

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<sup>7</sup> These points raise severe difficulties for Jessica Wilson's recent attempt to characterise the denial of emergence in terms, simply, of the truth of a causal inheritance principle of the sort given above (Wilson 1999, 42). The principle may well be false of Nonemergent Materialism and, even if it were not, fails to express the idea that the basic physical properties supply the causality.

On the other hand, suppose it is suggested that the laws of physics are fundamental because they do not derive from any other laws in the sense outlined in section 1. If the laws of physics were not fundamental, one of the following scenarios would hold.

The first possibility is *Emergent Dualism*. Here, the fundamental laws are some physical laws, some physico-psychological laws and some psychological laws. Collectively these laws fix how ensembles of basic physical properties will behave as complex structures in the brain. The truth of our statements about how these ensembles interrelate is a consequence of the laws mentioned above.

A common objection to *Emergent Dualism* is that it cannot explain how there is harmony between the laws of physics and the emergent laws of, say, psychology. Why do not psychological laws fix things to go one way, and physical laws fix things to go the other way (Kim 1992b, 120; Pettit 1993, 221)? The answer is straightforward. To avoid such clashes, we must claim that some laws are fundamental and others are derivative. But we do not need to suppose that all the fundamental laws are at the physical level. Philip Pettit is wrong to claim that only Materialism “explains why laws at different levels work so smoothly and systematically in tandem,” not having to appeal to “happy coincidence of effect or any pre-established harmony” (Pettit 1993, 221). Emergent Dualism can do just as well. Emergent Dualism and Materialism just differ over the laws they judge to be fundamental.

A second scenario involves what I claim should be called *Emergent Materialism*. Emergent Materialism holds that mental properties N-M supervene upon basic physical properties and yet that some of the psychological laws are fundamental. These fundamental psychological laws plus the fundamental laws of physics determine how *complex* physical properties interact. It is worth noting that this is just a special version of a widely considered hypothesis, namely that there are certain cases where there seems to be evidence that the activity of a whole cannot be derived from the activities of its constituents characterised by some basic physical properties. Some hold that EPR-Bohm systems described by Quantum Mechanics are a case in point (e.g. Silberstein & McGeever 1999, 187-189). If the hypothesis proved well founded, then there would be emergence of some basic physical properties from other basic physical properties. The only difference with my present suggestion is that it is envisaged for a property of interest to psychologists.

Finally, there is what we might call *Simple Harmony Materialism*. This rejects the claim that it makes sense to distinguish between fundamental laws and derivative laws except as a point about complete coverage. The fact that mental properties and psychological properties strongly N-M supervene upon basic physical properties and their laws

just shows that the laws governing different levels of being are in harmony with each other. This would not be surprising. The various systems of laws we identify are just different ways of carving up the necessities observed in nature. It is just that some are more detailed than others.

The objector to my approach is committed to denying that *Emergent Materialism* and *Simple Harmony Materialism* are properly thought of as versions of Materialism. Neither asserts that only the laws of physics are fundamental in the required sense. The objector would limit Materialism to what we might call *Fundamentalist Materialism*. This couples my proposal with the additional claim that only the laws of physics are fundamental in a sense my proposal fails to capture. However, the restriction seems ill-motivated. *Emergent Materialism* allows that an emergence which might characterise the relationship between certain basic physical properties might also characterise the relationship between basic physical properties and mental properties. It is hard to see why the latter case should be thought to imply that Materialism is false. It might be argued that, in such a case, the mental properties would be characterised as basic (macro) physical properties. So the laws of physics would be fundamental even here. But then my proposal would yield the same verdict as those who insist that (M2)/(M3) ought to be added to the characterisation of Materialism. The only remaining difference between us would be with the proper characterisation of *Simple Harmony Materialism*. I find it hard to believe that denying the distinction between fundamental and derivative laws envisaged here is tantamount to rejecting Materialism.

Thus I present those who argue that my proposal cannot capture the claim that the laws of physics are fundamental with a simple dilemma. Either by ‘fundamental law’ you just mean complete coverage of the sort I identified at the beginning of this discussion. If so, then my proposal can capture the claim. Or by ‘fundamental law’ you mean nonderivative laws in the sense I have tried to specify. In which case there are versions of Materialism which do not claim that the laws of physics are fundamental. If that is right, my proposal does not need to capture the claim that the laws of physics are fundamental. I think we need to be told which notion of fundamental the objector has in mind. Either way, this final objection appears without foundation. If I were to sum up the message of this final section of the paper it is: do not insist that the proper account of Materialism must capture all the features of your favoured version of Materialism. It need not, and it does not.

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