Cartesian Psychophysics

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I

In this paper, I shall examine a certain style of argument against the possibility of a Cartesian psychophysics, and a response to it. Both are due to John Foster.¹

The argument targets classical interactionism. Allow me to begin by giving a minimal construal of the doctrine:

(MC) Some sentient creatures are psychophysical unions of material and immaterial substances that have mutual causal influence on each other.

This itself divides into various claims; two are of direct relevance:

(D1) Material and immaterial substances are distinct.
(D2) Material and immaterial substances within psychophysical unions have causal influence on each other.

A third claim, which is standardly understood to be part of classical interactionism but is not entailed by (MC) is:

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¹ Foster has discussed these ideas in a number of places, beginning with the paper he wrote for his first B. Phil. supervision with A. J. Ayer, later published as "Psychophysical Causal Relations", American Philosophical Quarterly, 5 (1968) 64–70. More developed versions are to be found in his paper for Ayer’s festschrift, "In Self-Defense", in G. F. MacDonald (ed.), Perception and Identity (London: Macmillan, 1979), and in part III, sections 7 and 8 of his monograph A. J. Ayer (London: Routledge, 1985). The core argument and response have remained constant, though Foster has changed his mind on the nature of causation and aspects of the dialectic. The most recent account of these matters is in his The Immaterial Self (London: Routledge, 1991). The section of direct relevance is “The Problem of Causal Pairings” in ch. 6.
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(D3) Immaterial substances are non-spatial; that is, they have no spatial properties.²

I will now pause to make two qualifications. First, I do not wish to decide whether classical interactionism is committed to the claim that we are psychophysical unions or that we are immaterial substances with material appendages. The more general formulation is that some sentient creatures involve psychophysical unions of mutually interacting substances; but this is rather clumsy so I shall stick with the simpler (MC). In any case, the problems of this essay arise for any interactionist who assents to (D1), (D2), and (D3). Secondly, it is not my intention to spell out a positive conception of immaterial substance in this essay; I am primarily concerned to evaluate the status of an argument that is in play as long as (D1) through (D3) are accepted. For present purposes, it should suffice to say that immaterial substances are non-spatial and essentially mental.

I take it that (D1), (D2), and (D3) are jointly insufficient but necessary for classical interactionism.

The paper is divided into three parts. In the first (Sections II and III), I describe a certain kind of problem for classical interactionism. I begin by considering traditional scepticism about classical interactionism, and use this as a springboard for developing a precise worry about interactionism that also stems from doubts about the possibility of psychophysical interaction given the non-spatiality of immaterial substance—Foster’s ‘causal pairing problem’. In the second part (Section IV), I set up Foster’s response to the causal pairing problem in terms of individualised psychophysical laws. Foster’s solution is ingenious, but is, I argue, inconsistent with our conceptual commitment to the generality of causation—that the causal relation holds between two entities in virtue of the kinds they fall under as opposed to which particular things they are. This leads to the third and final part (Section 5), where I tease out certain unpalatable consequences of a metaphysics of individualized laws or dispositions. I argue that in order to accommodate the empirical fact of metabolic turnover, the theorist has to be committed to certain radical claims about the nature of human bodies and matter in general. I conclude by briefly considering whether classical interactionism should abandon the claim that immaterial substances are non-spatial.

II

Much of the traditional scepticism about classical interactionism stems from (D3), the non-spatiality of the soul. Anthony Kenny expresses this line of thought, which goes back to Princess Elisabeth of Bohemia, when he writes:

² I also mean to sidestep the issue of whether immaterial substances are non-spatial or merely unextended. I take it that theories claiming the latter are non-classical.
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On Descartes’ principles it is difficult to see how an unextended thinking substance can cause motion in an extended unthinking substance and how an extended unthinking substance can cause sensations in the unextended thinking substance. The properties of the two kinds of substance seem to place them in such diverse categories that it is impossible for them to interact.³

Kenny’s remark highlights a dubious feature of classical interactionism: on Descartes’s principles, it is not at all clear how substances with such diverse properties can interact. (This is somewhat exacerbated by Descartes’s ‘primary attribute’ conception of substance—which effectively means that distinct substances can share no properties.)⁴ But Kenny has little more to say against classical interactionism, resting his case on this brief description of a problem. Here Kenny is not alone. This style of objection is often read as definitive against classical interactionism in contemporary philosophy.

The dialectical force of this traditional objection is, I think, greatly overrated. At best, it issues an explanatory challenge to the interactionist: that he may not, as Swinburne does in The Evolution of the Soul, take mind–body interaction as a brute inexplicable connection (perhaps only comprehensible by higher beings, like God) while asserting (D1), (D2), and (D3).⁵ (I shall call this the ‘primitivist’ position.) If classical interactionism is to blunt the dialectical force of the explanatory challenge, interactionists must at least attempt to make the possibility of mind–body interactionism intelligible. As Jaegwon Kim puts it,⁶ the explanatory question is not how a being like God links the soul and the body, but rather what God is doing when he links the soul and the body; that is, if this is done via some relation R, what relation R is God using to do the job? I mention God here because the primitivist position often includes the claim that it is not obliged to answer this question because (1) God provides the mind–body link and (2) we couldn’t possibly understand how he does it. Such a primitivist refuses to meet the challenge to explain what God is doing when he links the soul and the body.

There are, however, a number of ways the traditional worry might be developed. One suggestion is that it is the very diversity of kinds of substances that leads to the impossibility of classical interactionism. This is justified by a principle to the effect that substances can only interact causally with substances

⁴ The disjointedness of families of properties associated with distinct substances does not follow on a ‘profligate’ conception of properties, on which every predicate corresponds to a property, since distinct substances will at least share the property of being substances. It is clear, however, that Descartes is working with a ‘sparse’ conception of properties on which they, so to speak, ‘carve nature at its joints’. (See esp. his metaphysics of substance as presented in the Second Meditation and the Principles of Philosophy.)
of the same kind. Assuming that causation relates *events*, the principle behind the objection can be formulated as follows:

**Homogeneity**

An event \( c \) involving a substance \( A \) can enter into causal relations with another event \( e \) involving a substance \( B \) only if \( A \) and \( B \) are substances of the same kind.\(^7\)

However, Homogeneity seems to be an excessively strong constraint to place on causation. Consider the case where we have a kind of substance that is like material substance in all respects except that it essentially lacks a property that material substances essentially have, say mass. Call this kind of substance \( M^* \). Now we can pose the question of whether events involving \( M^* \) substances can causally interact with events involving material substances. Absent any obvious reason to the contrary, there does not seem to be any general reason why events involving \( M^* \) cannot causally interact with events involving material substances—unless it can be shown that causal interactions between events involving the two substances *must* be mediated by mass.

But might we not weaken the homogeneity principle to one that only requires the substances to be sufficiently similar? It is, however, crucially unclear what ‘sufficiently similar’ amounts to in this context. If immaterial substances have spatial addresses at extensionless points, does that mean that they are now sufficiently similar to material substances, and so interaction is possible? The principle doesn’t seem to give us any answers here. Whilst the causal principles we have been concerned with only specify necessary conditions on causation, the crucial unclarity of ‘sufficient similarity’ in this context seems merely to raise the explanatory challenge: that mind–body interactionism needs to be made *intelligible* —and that takes us back to the original suspicion about the non-spatiality of immaterial substances.\(^8\)

### III

There is, however, another way of developing the traditional scepticism about classical interactionism into a full-scale objection. This, too, springs from

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\(^7\) An allied principle used is that causal relations are restricted to things of the same ontological category. Again, this is shorthand for the proper formulation in terms of events involving the things in question. (Ducasse objects to this principle; see p. 88 of his “In Defense of Dualism”, in S. Hook (ed.), *Dimensions of Mind* (New York: New York University Press, 1960), 85–90.) This is stronger than the principle pertaining to substances. It is prima facie implausible because of apparent counterexamples like the perception of facts, which requires that a fact cause a mental event.

\(^8\) Perhaps one might respond that we don’t really know what making Cartesian mental agency intelligible means. But we still need to react to the questions that can be raised. It would be cavalier to simply brush them aside.
doubts about whether (D2) is sustainable given the interactionists’ acceptance of non-spatiality, that is, (D3). This style of objection proceeds from general constraints on the nature of causation—in particular, the absence of a contingent dimensional structuring framework for immaterial substances—to the conclusion that material substances cannot interact with immaterial ones because there are no appropriate criteria for pairing causes with effects. The argument is due to John Foster. He calls it the ‘causal pairing problem’.

Consider a scene from the Middle Ages: a disputation about mental ontology amongst schoolmen has almost degenerated into fisticuffs. Three philosophers are shooting paper pellets at each other with slings. What makes it the case that the dualist’s pellet hits the materialist but not the idealist? The force vector of the dualist’s sling was in the materialist’s direction, the materialist didn’t move in the meantime because he was busy aiming at the idealist, etc. In short, the materialist was appropriately located relative to the dualist. And in general it seems that spatial relations function as contingent structuring relations, insuring that the particular causal relata in any case are logically unique in that situation; that is, we have determinate cause–effect pairs in each situation.⁹

As a working assumption, let us assume what Foster calls the ‘nomological assumption’:

(NA) The causal relation between two events is completely determined by the non-causal properties and relations of the two events and the obtaining of certain relevant covering laws.

The problem for the interactionist is that, given the possibility of simultaneous exact qualitative mental duplicates and given that he only has a temporal relation to work with as an external pairing relation (since classical interactionism is committed to the non-spatiality of immaterial substances), it is not at all clear that he can find an external pairing relation to facilitate mind–body interaction—a relation to insure that mental causes can be uniquely paired with their material effects and vice versa. To be precise, the interactionist is facing at least two questions here, a general one and a specific one about embodiment:

(A) The general problem. Given the lack of an external pairing relation, how can immaterial substances which are non-spatial interact with material substances?

Even if the interactionist can answer (A), he still faces a second challenge to secure the specificity of embodiment:¹⁰

⁹ This requirement is perhaps too strong and we will give it up in due course: that there is no criterion for pairing doesn’t entail that there cannot be causal relations (cf. the Foster–Tooley indeterminacy-of-pairing case discussed in Section V.

¹⁰ This problem may be exacerbated by intuitions of independence that the interactionist may have regarding disembodiment; but, for the most part, I shall not consider modal theses to which
(B) *The specificity of embodiment*. How can the interactionist’s psychophysical laws account for the specificity of embodiment—that is, the fact that *my* mind interacts just with *my* body and no other, and vice versa—for the range of sentient creatures that classical interactionism is committed to in its minimal specification (MC)?

Answering (A) does not automatically present an answer to (B); and though questions (A) and (B) are distinct, one fails to answer the question of how interactionism is possible for beings like us if one gives an answer to (A) that does not also answer (B).

The natural interactionist strategy at this stage is to hunt down an external pairing relation to supplement the temporal relation and to secure unique causal pairing. An obvious candidate is the relation of embodiment (‘x is embodied in y’). Thus supplemented, the laws yield unique causal pairing—but the account is, unfortunately, circular. Such laws assume the notion of embodiment, which on the dualist account is something like direct causal interaction between a particular mind and its body; *but how then is the dualist to explain this causal attachment?* If we return to a solely temporal pairing relation we have no unique pairing (or unique pairing by luck, as it were). But on pain of circularity, we cannot use a pairing relation such as embodiment.

Most of the time the dialectic stops at this stage. The antagonist cannot think of any suitable external relation and infers that classical interactionism is untenable.¹¹ For example, Jaegwon Kim concludes from a similar argument that classical interactionism is *unintelligible*. Indeed, he claims that even soul–soul causation is impossible in the absence of a structuring framework, since souls are essentially non-spatial but space is the only dimensional framework Kim can think of.¹²

A charge like that can be met in various ways. One is to hypothesize quasi-spatial ordering relations between non-spatial immaterial entities that would function as a contingent structuring dimensional fabric.¹³ (These need not be isomorphic to spatial relations, but need to structure immaterial entities in a way that will at least respect ‘quasi-spatial exclusion principles’ analogous to spatial exclusion principles.) There is no obvious inconsistency in relating immaterial substances to material substances by these hypothesized relations, and classical interactionism is standardly thought to be committed. (But see the discussion in Section V for an interesting modal wrinkle.)


¹² Kim, “Lonely Souls”.

by some such relations we seem to have a glimmer of what it might mean to think that immaterial substances can interact with material substances. Modulo the difficulties of finding a viable quasi-spatial framework that might provide contingent structuring relations of the appropriate sort, the suggestion seems to make some sense of classical interactionism, and it does not seem to me that any difficulties with finding an appropriate relation can translate into conceptual incoherence for classical interactionism. (It is, however, important to realize that the sense of intelligibility here is thin. As Shoemaker says: "It is not that we have a determinate conception of some kind of immaterial substances, and can conceive of there being things that satisfy this conception. It is rather that we can conceive of having (or acquiring) such a determinate notion, and of believing, intelligibly and consistently, that there are things that satisfy it."¹⁴)

Another way of meeting the unintelligibility charge is suggested by Daniel Garber's response to the charge on Descartes's behalf.¹⁵ Garber writes:

Mind–body interaction seems to be, for Descartes, a paradigm for both mechanist and Scholastic causal explanation. Since there were two main competitors at the time, we can say that, for Descartes, mind–body interaction is the paradigm for all causal explanation, it is that in terms of which all other causal interaction must be understood. . . . Mind–body interaction must be basic and intelligible on its own terms since if it were not, then no other kind of causal explanation would be intelligible at all; to challenge the intelligibility of mind–body interaction is to challenge the entire enterprise of causal explanation. Furthermore, we cannot give a simpler or more easily understood account of causal interaction than mind–body interaction because there are no more basic or more inherently intelligible ways of explaining the behaviour of anything open to us. We cannot appeal to analogies with impact to clarify mind–body interaction, as Elisabeth does, not because of any confusion of primitive notions, but because we must work the other way: body–body interaction must ultimately be understood through the notion we have of the way in which the mind acts on the body.¹⁶

¹⁴ Shoemaker, "Immortality and Dualism", 147 n. 8.
¹⁶ Ibid. 188. The textual evidence for Garber's claim that mind–body interaction is the paradigm notion of causation for Descartes comes from two sources. For scholastic explanation, it derives from Descartes's discussion of how understanding the idea of heaviness is derivative from understanding the mind, and mind–body union. The relevant passages are in the Sixth Replies, in C. Adam and P. Tannery (eds.), Œuvres de Descartes, rev. edn. (Paris: Vrin/CNRS, 1964–76) (henceforth, 'AT'), vii. 442. The chain of ideas tracing the intelligibility of mechanistic explanation back to the intelligibility of mind-body interaction is more circuitous. The relevant passages are in Descartes's letters to More in 1649 discussing the nature of motion, AT v. First, all motion is due to God: "motion transferred, motion begun, and motion ended in impact must derive from God himself, shuffling bodies about as part of the process of 'conserving the same amount of translation in matter as He put in it the first moment of creation' (Descartes to More, August 1649, AT v. 403–4)" (Garber, "Understanding Interaction", 184). The burden of proof is now on how we understand divine causation of motion, a problem similar to that for classical interactionism, since God too is incorporeal, and thus unextended. Here Descartes writes that "the only ideal I can find in my mind to represent the way [modus] in which God or an angel can move matter is the one which shows
The import of this suggestion is that mental agency is conceptually primitive. Garber’s idea is that it is open to a classical interactionist to say that we can only understand causation because our experience of agency presents us with instances of mental causation of bodily effects; and that our understanding of causation in other instances is derived from this basic phenomenon.¹⁷ I am sympathetic to the suggestion that our experience of agency constitutes the basic source of causal understanding. But the plausibility of this phenomenological observation concerning conceptual genealogy, while underlining the indispensability of agency and mental causation in our conceptual scheme, fails to buttress classical interactionism. Nothing about the conceptual primitiveness and entrenchment of mental causation in our conceptual scheme helps to make sense of how immaterial substances lacking in spatial properties can enter into causal relations with material substances. It would be a mistake to read the dialectical force of Garber’s observation as establishing the possibility of mental causation, given a certain ontology of the mental, after that ontology has been independently established. Nothing has been shown about how mental causation is possible within that ontological framework!

That mental agency is conceptually basic for us doesn’t mean that any ontology of the mind–body relation gets mental causation of bodily effects for free. That gets the dialectic backwards. Rather, given the conceptual primitiveness of mental agency with bodily effects, giving an intelligible account of mental agency specifies a strong constraint on any theory of the mind–body relation. Any credible theory had better be able to give an intelligible account of mental events causing bodily events (or if not, it had better be able to provide a powerful error theory). As such, Garber’s point, while conceptually astute, is, so to speak, ‘ontology-neutral’ and fails to buttress a classical interactionism committed to (D1) through (D3).

In this first part of the paper, we saw how Foster crystallized the vague worries associated with traditional scepticism about interactionism into a specific problem: how is it possible for there to be causal interaction between non-spatial immaterial substances and material substances, in the absence of external pairing relations such as those provided by space? The upshot of our discussion is that, in light of (NA), the interactionist has to answer a question about how we tie down mental events to a specific body. In the next part of the paper, we shall explore Foster’s solution to this difficulty.

me the way in which I am conscious I can move my own body by my own thought’’ (Descartes to More, 15 April 1649, AT v. 347). Thus even the way in which we can conceive of God acting upon the world is derived from the conception of how I act on my body.

To enter some disclaimers for Garber: he does not say that this suggestion circumvents all or even any of the problems that have been raised for classical interactionism; but he does think that Descartes had the materials to respond in this way to Elisabeth’s inquiries, and that this suggestion is philosophically superior to Descartes’s actual responses to Elisabeth.

¹⁷ Endorsing the conceptual necessity of mind–body interaction for understanding causation at large significantly bolsters the case of the primitivist. I am not aware of any primitivist who has taken up Garber’s suggestion.
The causal pairing problem appears to be insoluble for the classical interactionist given (NA) and the lack of a spatio-temporal framework. Having set up this obstacle to interactionism, Foster then sets out to surmount it. His solution is subtle: he simultaneously undermines (NA) yet manages to secure the specificity of embodiment.

Foster attacks the nomological assumption directly. Using a classic argument for singular causation, he shows that even in physical causation, you get perfectly symmetrical situations where you cannot pair the causes.

The Foster-Tooley counterexample against the nomological assumption runs as follows:\(^{18}\) Consider two particles \(x\) and \(y\), both of type \(\Delta\). It is a law that particles of type \(\Delta\) emit a single flash of light within a 1 metre radius around the particles every 10 seconds. Consider a situation in which \(x\) and \(y\) are placed adjacent to each other so that there is an area where the radii within which they emit light flashes overlap. At time \(t\), two flashes of light, \(f_1\) and \(f_2\), simultaneously appear in the overlapping ‘emitting zone’.

(NA) claims that the causal relation between any two events is fixed entirely by the non-causal properties and relations of the two events and the obtaining of certain relevant covering laws. But this is not true for the case at hand. Fixing the non-causal properties and relations of the flashes \(f_1\) and \(f_2\) and the particles \(x\) and \(y\), and the relevant covering laws, fails to determine whether flash \(f_1\) was emitted by \(x\) and \(f_2\) by \(y\) or the other way around. So (NA) is false.

(In fact, the case constitutes a counterexample to a weaker formulation in terms of supervenience:

\[\text{(NA')} \text{ There can be no difference in the causal relation between two events without a difference in either the non-causal properties and relations of the events or the covering laws.}\]

If the case described above is a possibility, then we have a situation in which there can be differences in the causal relations between flash and emission events, without differences in either the non-causal properties and relations of the events or the relevant covering laws. Thus, fixing the laws and non-causal factors fails to fix the causal relations. Given this, we can reject (NA) and any other thesis which entails (NA’).)

Here is where Foster’s pincer strategy comes into play. Even given singular causation, the interactionist is obliged to explain why this brain only directly interacts with this mind and that brain only with that mind; the specificity of embodiment needs to be explained. It is important to note, however, that there is

\(^{18}\) See e.g. D. M. Armstrong’s presentation of the argument in the chapter on singular causation in his *A World of States of Affairs* (Cambridge: Cambridge University Press, 1997).
an asymmetry between cases of symmetrical physical causation and interactionist scenarios. In the case of symmetric physical causation canvassed above, there is no pressure to explain why the flash appears here rather than there; but in the case of classical interactionism, we have to explain—even given singular causation and the failure of (NA’)—why this mind only interacts with this brain (and no other), and that mind only with that brain (and no other). This is explained by recourse to individualized psychophysical laws.

Rather than hunting for some relation to supplement the temporal one, Foster restricts the scope of psychophysical laws to particular persons.¹⁹ For example,

\[ L(Mary): \text{It is a law that whenever a } \Phi_1 \text{-event occurs in (Mary’s) brain } B_M \text{ at a time when } B_M \text{ is of structural type } \Sigma, \Psi \text{-experience occurs a tenth of a second later in (Mary’s) mind } M_M. \]

\[ L(Harpo): \text{It is a law that whenever a } \Phi_1 \text{-event occurs in (Harpo’s) brain } B_H \text{ at a time when } B_H \text{ is of structural type } \Sigma, \Psi \text{-experience occurs a tenth of a second later in (Harpo’s) mind } M_H. \]

(And similarly for other people with the appropriate substitutions.) Foster’s solution here is to secure the specific psychophysical arrangement characteristic of embodiment by recourse to an appropriate system of scope-restricted laws—laws which by their scope restriction “limit the fields of influence and sensitivity of each in the requisite way”. This is not to reinstate the nomological assumption, for the point of postulating the scope-restricted laws is only to explain why psychophysical causal relations are regular and not to reduce them to nomological facts.

But we might worry that scope-restricted laws lack nomological generality. We don’t expect that the identity of particular objects is a nomologically relevant factor. Rather, we think that causation takes place in virtue of the kinds of individuals that enter into the causal relation (and certain other locality conditions); which particular things is irrelevant.²¹

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¹⁹ Peter Unger in his *All the Power in the World* (Oxford: Oxford University Press, 2006) uses individualized dispositions to solve the same problem. Presumably individualized laws will supervene on individualized dispositions or the other way round depending on whether laws or dispositions are more basic in the ontology.

²⁰ The Immaterial Self, 167.

²¹ Another worry is that the fact that the interactionist can stipulate such laws doesn’t imply that they exist. The interactionist may meet such a worry by showing that the laws do work beyond that which they were designed to do, and this increases their independent plausibility. Worries like this highlight issues of evidential force of various claims in the dialectic. I intend to sidestep these issues; in this paper I concentrate on finding internal problems with Foster’s solution. I am interested in what costs we would incur by postulating that Foster’s solution describes how things actually are.

In the face of the stipulation objection, in *All the Power in the World* Unger argues that individualized dispositions are not as weird and rare as we think. He describes a class of self-directed dispositions and argues that these are conceptually independent of space. The objector, he argues, confuses the pairing problem with an individuation problem. Unger is also willing to
Foster responds that scope-restricted laws are not “nomologically capricious”, for the “nomological constraints do not vary inexplicably from person to person”. Psychophysics is general in a certain sense: whenever there is a psychophysical law for a certain individual, there are exactly similar scope-restricted laws for everyone. We might think of the scope-restricted laws for each individual as instances of a general law:

\[ L < \Sigma, \Phi, \Psi > : \text{It is a law that there is some 1–1 correlation between human brains and human minds such that any } \Phi\text{-event in a brain } x \text{ of structural type } \Sigma \text{ is a tenth of a second earlier than some } \Psi\text{-experience in that mind which is correlated with } x. \]

The nomological factor is invariant, discounting the reference to the particular brain and mind in question. It is not that the individualized laws can be deduced from \[ L < \Sigma, \Phi, \Psi > , \] since it does not specify which brain is related to which mind—so this does not reinstate the reductionist (NA). \[ L < \Sigma, \Phi, \Psi > \] specifies that there is a correlation and the individualized laws then go on to secure the causal links.

There is, however, an important proviso: the dualist mustn’t go on to account for the unity of a mind in even partially causal terms, otherwise a circularity lurks. For the account of unity presupposes psychophysical causation, while the psychophysical causation account presupposes a prior account of what constitutes a single mind.

But one wonders why there is a need for ineliminable reference to particular minds and brains if everyone gets exactly similar laws. Are the individualistic laws Foster posits more than a redescription of the problem? Why is it that we don’t need these individualistic laws for causation across the sciences, but we speculate on the possibility of a space-like framework that minds might reside in, but he uses that to solve the individuation problem.

It is difficult to assess the dialectical force of the individuation problem, but whatever force something like the individuation problem has, there is a certain style of argument against immaterial substances from the lack of a principle of individuation that is flawed. Ernest Sosa in the appendix to his “Subjects Among Other Things” sets out two principles for the metaphysics of individuals, Diversity Cannot Stand Alone (DCSA) and Entities Require Dimensional Framework (ERDF).

DCSA: “No entities \( x \) and \( y \) can possibly be related only by diversity in such a way that the following three conditions are satisfied: first, \( x \) is numerically distinct from \( y \); second, \( x \) is otherwise the same as \( y \) in every qualitative respect; and, third, \( x \) is related to \( y \) by no relation that is irreflexive, except only for the relation of diversity (and its deductive progeny).”

ERDF: “If entities \( x \) and \( y \) belong to the same category, they must fall within a dimensional framework, which requires the presence of some ordering relation that relates the two.”

Sosa argues for the former principle (and thus implicitly for the latter) by means of what I call the ‘my foot, not my feet argument’: the lesson, Sosa argues, is simply that no entities \( x \) and \( y \) can simply be related by diversity, for otherwise you might have not just one right foot but indefinitely many of them, all related only by diversity. The proper response is that we have no reason to posit so many feet, whereas we seem to have theoretical reasons to posit immaterial substances.

²² The Immaterial Self, 168.
need them for psychophysics? Is the notion of individualistic laws ultimately consistent with our conception of causation?

Notice that even if one rejects (NA)—that is, even if one rejects the unique pairing requirement—that doesn’t entail that causation doesn’t still happen in virtue of the kind of things (and certain other locality constraints) as opposed to which particular things. My point is that there is more than one route to a causal pairing problem for the classical interactionist. The route that we’ve developed (following Foster) concerns the availability of a dimensional background that functions as a contingent structuring framework for causation. Another route is from the notion of causal generality, the idea that causal relations between events happen in virtue of non-haecceitistic properties. (A haecceitistic property is the property of being identical with a certain particular individual; e.g. your being identical with you, my being identical with me, etc. Note that this is not the property of being identical with some individual or other, which we all share.) The intuitive plausibility of a thesis of causal generality can be illustrated by a simple thought experiment.

Consider the case of three elementary physical particles, a, b, and c, of kind π. As it happens, a repels only b and b repels only a. These two particles fail to interact with c no matter how close they are to c. In fact, the thought experiment can be set up in two ways: (i) a interacts only with b regardless of the distance between them, even when c is adjacent; or (ii) within a certain distance, a interacts only with b, but when b is not in the appropriate vicinity for interaction and c is, a still fails to interact with c. We do not think that these are plausible scenarios, because we implicitly subscribe to a principle of causal generality.

Though the causal pairing problem can be developed from two directions, there is no doubt that the two assumptions can interact: causal generality entails the impossibility of haecceitistic causation (i.e. causation where an entity’s identity—as opposed to just the kind it falls under—is relevant, e.g. the sort of scope-restricted laws that Foster posits), whilst the lack of a structuring framework implies the lack of an external pairing relation which pairs cause and effect, given causal generality.

Note that the Foster–Tooley counterexample is not a counterexample to generality but to the supervenience thesis (NA’) and any thesis that entails it. In their scenario, though we do not have determinate causal pairing relations, we can in all of the putative pairings make sense of a causal link in terms of spatial arrangement and the covering law. The scenario is consistent with the thesis of causal generality—that causation takes place in virtue of the kind of things that enter into the relation rather than the particular identity of the things involved. Thus, the classical interactionist has not yet come to terms with the strong intuition we have of causal generality, since the Foster-Tooley case sketched above against (NA’) is perfectly consistent with causal generality, and, as the simple thought experiment illustrates, there is reason
to think that our understanding of causation includes a tacit commitment to
generality.
I am unable to pursue further the line of argument from causal generality in
this paper, since it would take us too far afield. Rather I will hint at how one
might pursue the dialectic on whether we are committed to causal generality,
since it has largely been left at an intuitive level. The first thing to note is that
the pairing problem is not merely a problem about criteria for pairing causes,
since there are physical scenarios where the symmetry of the causal situation
does not allow us to uniquely pair causes to their effects. Rather, the absence
of a criterion for pairing causes is symptomatic of an underlying commitment to
causal generality and the absence of a dimensional framework that individuates
Cartesian minds. One can see this distinction when one considers that if the
pairing problem merely consisted in the absence of a criterion for pairing, then
Descartes would have no problem with it since he posits singular representation
relations between minds and their bodies. But we do not think that this then
shows us how Cartesian psychophysics is possible—we still want to know just
how non-spatial minds can interact with bodies. Thus I suggest the real question
here is one concerning causal generality.

How, then, might we push the dialectic further? The dualist here is positing a
kind of sui generis singular causal relation, whose singularity does not consist in
spatio-temporal factors obtaining. Can we really make sense of such a singular
relation given our commitment to causal generality? It may seem that there
is no prima facie inconsistency between these individualistic powers and our
conception of causation. But perhaps our understanding of causation involves
some commitment to, for example, mechanism (or something similar)—a
commitment that requires us to be able to make sense of the causal scenario
via spatio-temporally localizable interactions. Or it may be that our concept
of causation is interventionist, where, crudely, for \( x \) to be a cause of \( y \) is for
intervening on \( x \) to be a way of intervening on \( y \). Interventionist theories of
causation do not appeal to the idea of providing a mechanism, but it may be that
we are ultimately unable to understand the notion of an intervention in anything
but spatio-temporal terms.²³

Rather than conducting the dialectic at the level of general constraints on
causation, I propose to steer the debate toward a specific consequence of a meta-
physics of individualized laws. This, I shall argue, illustrates the incongruence
of a metaphysics of individualized laws with certain other general metaphys-
ical commitments that we may have. The original problem of psychophysical
interaction turns up as a bump elsewhere in the carpet.

²³ See e.g. John Campbell’s “An Interventionist Approach to Causation in Psychology”, in
A. Gopnik and L. Schulz (eds.), Causal Learning: Psychology, Philosophy and Computation (Oxford:
Oxford University Press, forthcoming) and the references there on interventionism. Here I am
indebted to discussion with Michael Martin.
We now turn to the third and final part of this paper.²⁴ My argument here consists in teasing out certain unpalatable consequences of a metaphysics of individualized laws or dispositions. I see this as a specific development of the dialectic arising from the inconsistency of individualized laws or dispositions with general conceptual commitments we have about the nature of causation.

The difficulty I shall consider stems from the need of the interactionist to accommodate the empirical fact of metabolic turnover. I shall argue that if the interactionist is to accommodate this within an individualistic metaphysics of causation, he is forced to embrace certain radical claims about the nature of human bodies and matter in general.

Every day, our bodies change large numbers of particles; in particular, my body may assimilate material particles formerly in bodies of other sentient creatures or it may assimilate particles which have never been incorporated into a body. This has the consequence of radicalizing the notion of matter to which the interactionist of Foster’s stripe is committed. To establish this, we have to consider the consequences for all the available metaphysical stories about bodies: that they are just swarms of particles, or just a series of mereological sums, or wholes that are not mere sums but can undergo change of parts. Let us call these pictures a nihilist metaphysics of bodies, a mereological essentialist metaphysics of bodies, and a commonsensical metaphysics of bodies respectively. Note that even though the discussion will be couched in terms of the relation between minds and bodies, the most relevant entities for psychophysics are brains, since we may lose quite a large number of other body parts and still function, but cannot lose our brains. In the following discussion, let ‘body’ stand for whatever medium-sized organic thing (organ or organism) is connected by laws to the mind.

(A) Nihilist metaphysics. On this there is only a swarm of particles shaped ‘body-wise’—but no body. (There are no swarms either. A ‘particle swarm’ merely picks out a group of particles in close proximity.)²⁵ Given metabolic turnover by the ‘body’, the particles that constitute our ‘bodies’ will be continually changing. It seems that excepting incorporation into the ‘bodies’ of mental subjects, material particles do not possess individualistic dispositionality. Even classical interactionists who accept some solution like Foster’s are apt to think that causal generality holds except in the case of the psychophysics of sentient individuals. But how then is it possible that material entities can individualistically

²⁴ This section has greatly benefited from extensive comments from Dean Zimmerman.
²⁵ See e.g. Cian Dorr’s “The Simplicity of Everything” (Ph.D. dissertation, Princeton University, 2002) and his more recent “What We Disagree about When We Disagree about Ontology”, in M. Kalderon (ed.), Fictionalist Approaches to Metaphysics (Oxford: Oxford University Press, 2005).
interact with mental substances? — Do material particles acquire individualistic dispositions when caught up in the life of a mental subject?²⁶

The situation gets more problematic once one considers that, at some later time, your 'body' may incorporate some material particles that I shed. Do these material particles then lose their disposition to interact only with my mind and then acquire a disposition to interact only with yours?²⁶

My argument requires two premises and certain simplifying assumptions. The premises are: (1) it seems possible that any material particle that could be incorporated by the 'body' of one mental subject could be incorporated into the 'body' of any other mental subject. This is uncontroversial. And (2) it is implausible to think that material particles acquire individualistic dispositions once incorporated into a 'body'.²⁷ This is because even though the classical interactionists think that minds can causally influence certain parcels of matter, they do not think that minds can change the nature of these parcels of matter.

The assumptions: By 'behaviour' I mean to refer to what the term was used for traditionally; that is, externally accessible actions—as manifested in bodily movements. For simplicity, let us assume that we can individuate types of behaviour by the distinct kinds of bodily movement that they involve. Let us also assume that the ability to perform each kind of behaviour is associated with a single 'behavioural disposition' and that the dispositions of individual particles have to coordinate with dispositions of other particles in the body-shaped particle swarm to sustain the large-scale behavioural dispositions.

²⁶ I am conducting the argument with dispositions rather than laws because it is slightly more intuitive. But the argument can be run in terms of laws.

²⁷ Unger sees no problems with the acquisition of individualistic dispositions on the part of objects, but his approach seems to me to be excessively cavalier. (See All the Power in the World, ch. 7, esp. pp. 456–60 on 'bodily flexibility'.) The original problem for classical interactionism is posed by how (D2) is possible given (D3), but with the background assumption that, as Foster puts it, the mental and physical realms are both fundamental and ontologically separate. Foster defines dualism as the conjunction of five claims: (1) There is a mental realm. (2) The mental realm is fundamental. (3) There is a physical realm. (4) The physical realm is fundamental. (5) The two realms are ontologically separate (The Immaterial Self, 1). Insofar as the original problem is as I describe it, Unger is changing the game, since he is explicitly denying Foster's fifth assumption. The denial, however, is a strong one, since he appears to think that minds can 'infect' particles with individualistic dispositions towards them when they are absorbed into bodies (if they are the bodies of 'minds'). Whilst there is no conceptual incoherence in this, I am sceptical of this way of thinking about matter. After all, the classical interactionist was originally motivated to allow for causal influence of minds on bodies (and vice versa). Affecting the trajectories of particles, say, is not a matter of changing their natures, but rather being (yet another) cause acting on them. Also, Unger appears to think that if a particle joins a mob of particles that are already individualistically directed toward a mind, then that particle can acquire individualistic dispositions toward that mind (p. 460). I discuss and reject this as implausible in the main text. With regard to that passage, it is also unclear whether he is really thinking of hypothetical, general dispositions of the sort that I discuss in the main text (and has slipped into a non-nihilist metaphysics of bodies) or is thinking of bona fide individualistic dispositions.

This paper was written before Unger’s monograph was published, though I had access to an early draft. I intend to consider the details of Unger’s metaphysics in a later paper.
The upshot of this is that for every single behavioural disposition—individualized, naturally, since it is the ability of this mind to act with this particle swarm—that an individual sentient being has, every material particle will have to have an individualized disposition for every sentient being that might ever exist in the universe. This is because it has to be able to interact individualistically with any sentient creature whose ‘body’ incorporates the particle. (I take it that, even though dispositions of individual particles have to coordinate with those of other particles to sustain large-scale behavioural dispositions, these too will have to be directed at the mental individual in question.) But it is an understatement to say that it seems unlikely that each material particle has dispositional sensitivities to all minds that can potentially be embodied in the history of the universe. This, if anything, is a veritable ‘combinatorial explosion’ of distinct dispositions. Before, where we had a single disposition for each kind of behaviour, now we need a very large family of these—one for each possible sentient creature.

One might respond that this is already the case with familiar physical particles, such as electrons, given the subtlety and highly varied repertory of their reactions to different situations. But it is important to notice that the complexity involved in the case of individualized dispositions is of a radically higher order. In the case of the familiar physical particles, their behaviour can be characterized by a set of relatively straightforward equations and the range of different numerical values solutions to these equations can take. In contrast, the physical particles with individualistic dispositional sensitivities not only have the dispositions that characterize the familiar physical particles, but also must have dispositional sensitivities to all possible mental subjects that can potentially be embodied, which is at least a very large number. Where before one only needed to invoke a single disposition (reacting to different dispositional response partners, in C. B. Martin’s lingo) to describe certain behaviour, now one needs a distinct disposition for each sentient individual that might exhibit such behaviour (and a distinct family of dispositions for the behavioural repertory of each individual). In the latter case, there is a veritable ‘combinatorial explosion’. Whilst there is no incoherence in this position even when this consequence has been highlighted, I maintain that such a consequence is highly implausible.

Furthermore, since we think that the universe could have existed without any sentient creatures, and since we do not think that the nature of material particles is radically altered by the presence of sentient creatures, it is implausible to think that material particles have dispositional sensitivities to mental subjects which they would not have if we or other sentient creatures did not exist—especially since we think that the probability of sentient creatures evolving in a material universe is rather low.²⁸

²⁸ Recognition of this point seems to require the classical interactionist to give up the fifth commitment of dualism as Foster defines it. This is a far weaker denial of the commitment to
There are several responses available to a classical interactionist. One is to identify a single particle lodged deep in the brain that is never lost as the locus of psychophysical interaction.²⁹ It will then serve a function not unlike that of the pineal gland for Descartes, directing further causal traffic in the body. Only this particle needs to have individualized dispositions directed at the mental subject it is psychophysically linked with; and because it is never lost during the life of the sentient creature, the particle need not have dispositional sensitivities to any other individuals.

This solution is unappealing for various reasons. That the particle is not lost does not mean that it does not have all the dispositional sensitivities that each material particle must have in order to cope with a situation involving individualized dispositions and metabolic turnover. Though the description of the response did not mention the initial stages of establishing the psychophysical link, a working psychophysics must make sense of the development of sentient creatures. It seems that if a material particle is recruited into a psychophysical system to play the role of this permanent material link, it must already be dispositionally sensitive to any mental subject with which it might be psychophysically linked—for otherwise it cannot interact with the mind that it later interacts with individualistically, since it has no resources for causal interaction with particular minds. In the early neonatal stages of brain development, how does the mind manage to ‘capture’ a particle in the brain to interact individualistically with it? A story according to which particles already have the requisite individualistic dispositions seems more plausible than one on which mental subjects can ‘capture’ a material particle and ‘infect’ it with individualistic dispositions directed toward it and no other mental subject. Whatever powers classical interactionists think mental subjects have, surely these do not include powers to induce individualistic dispositions in material particles.

But might not the interactionist who wishes to plump for this solution say that the possibility for individualistic interactions is written into the laws of material particles? These laws are rather like blank cheques (which can be used only once), where the material particle is individualistically directed at the mental subject with which it first comes into contact. On this story, only one particle will come into direct contact with the mental subject: whichever particle is the first to interact with the mental subject and is not already individualistically directed at another individual, that is, any particle ‘in the vicinity’ that still has a ‘blank ontological separateness, since it is a general consequence of there being sentient psychophysical beings in the world.

²⁹ Chisholm is said to have held a position like this at one time. But Chisholm’s was a materialist position which identified the mental subject with a single particle lodged deep in the brain that is never lost because of considerations about personal identity (as opposed to a view which used a similar strategy for interactionism). His thought there is not unlike that of the rabbis regarding the luz bone. See his “Which Physical Thing Am I?” in P. van Inwagen and D. Zimmerman (eds.), *Metaphysics: The Big Questions* (Oxford: Blackwell, 1998).
cheque’. But how is a non-spatial immaterial subject to interact with a particle that is not yet individualistically directed at it, since there are no obvious pairing relations to secure the causal link between them?

We may summarize the problems for the ‘blank cheque’ account as follows. First, on this picture the mind is non-spatial, so the notion of ‘coming into contact’ here is tenuous. Secondly, insofar as the mind is non-spatial, either the particle is already individualistically disposed to interact with it or it is not; if it is, we have the ‘combinatorial explosion’ of dispositions again; if not, we have no answer to the question how material particles can interact with a non-spatial immaterial mind.

A more interesting response is that there is no combinatorial explosion of dispositions because the dispositions I have ascribed to material particles are general dispositions, rather than individualistic ones. The objector reasons as follows: insofar as the dispositions of individual particles have to coordinate with those of other particles to sustain large-scale behavioural dispositions, they will have to be hypothetical powers of the form—‘disposed to interact with mind x, if caught up into the ongoing organic life associated with x; disposed to interact with mind y, if . . . y; (etc.’). But in that case, these dispositions are not individualistic, but general. This is because, rather than having a disposition for each particular mind in the universe, each particle only needs a disposition to interact with whichever mind is associated with the swarm into which it is drawn. This does not require particles to be selectively sensitive to particular minds, as is the case with individualized dispositions.

Now, if the dispositions have the alleged hypothetical form, then they are general and there is no combinatorial explosion of dispositions. But defusing the combinatorial explosion in this way also means that the dualist is left with no solution to the causal pairing problem, since the only powers in play on this understanding are powers to enable a particle to get caught up in a swarm that can already selectively interact with a mind—how selective interaction between swarms and minds is possible in the first instance has yet to be explained. (Remember that by a ‘particle swarm’ we are merely speaking of a group of particles in close proximity.)

I can think of three ways the dualist can secure this selective interaction:

1. The dualist may reject the suggestion that the dispositions of material particles are of the general, hypothetical sort, but are truly individualistic. The idea is that each particle can selectively interact with the mind it is attached to, and that the large-scale behavioural dispositions of a swarm to selectively interact with a mind just consists in the individualistic dispositions that each particle in that swarm has towards the mind in question. This is committed to a reductive conception of the large-scale behavioural dispositions. Fixing the individualistic dispositions of the particles fixes the large-scale behavioural dispositions of the swarm—even though strictly speaking there’s no composite object which possesses this large-scale disposition but only a group of particles
in close proximity. These dispositions will be individualistic as well, since they just consist in the dispositions of individual particles associated with the swarm in question that are directed at a particular mind. The possibility of selective interaction is thus allowed for at the ground level in terms of the individualistic dispositions of particles. But because particles have to be able to interact individualistically with any mind whose 'body' incorporates it, each particle has to have individualistic dispositional sensitivities to all minds that can potentially be embodied in the history of the universe. This way of securing selective interaction is thus saddled with the combinatorial explosion of dispositions.

(2) The dualist may embrace the suggestion that material particles have dispositions of the general, hypothetical kind. This avoids the prospect of combinatorial explosion of dispositions at the level of the dispositions of individual particles, but places the pressure of selective interaction on particle swarms (for all a body is on the nihilist picture is a group of particles in close proximity). The ability of particle swarms to interact selectively with particular minds is then explained by their possession of individualistic dispositions to interact with particular minds. Unlike in the previous scenario, the individualistic dispositions of swarms cannot be understood to consist in the dispositions of individual particles, since these have a general character. (Rather, particles interact with minds in virtue of their joining a swarm that can interact selectively with a particular mind.) The swarm has individualistic dispositions that are over and above any dispositions that the particles in that swarm possess—even though, strictly speaking, there are no such things as swarms, since we are assuming a nihilist metaphysics of bodies. Though I submit that there is some tension in this position, it is not obviously incoherent—at least, not without supplementary metaphysical premises. Assuming that there is no need to reify swarms in order to understand how groups of particles in close proximity can possess individualistic dispositions when individual particles do not, swarms (nihilistically understood) will have to possess individualistic dispositional sensitivities to all minds that can potentially be embodied in the history of the universe—in which case we have a combinatorial explosion of dispositions at the level of these swarms.

(Insofar as the tension I alluded to pushes us toward an anti-nihilist understanding of swarms, the picture collapses into one of the anti-nihilist metaphysics of bodies considered later. This highlights a difficulty in understanding psychophysics on a nihilist metaphysics of bodies. Nihilist metaphysics either needs to think in terms of particles interacting individualistically with minds or in terms of swarms. The former departs from our standard conception of psychophysical laws being links between minds and certain medium-sized entities. On the most natural understanding of how the latter is possible, there is pressure to abandon a nihilist metaphysics.)

(3) The dualist may claim that if groups of particles have special powers to generate minds, then a group of particles can have a singular relation to the mind
it generates. Naturally, this singular relation cannot be explained by recourse to spatio-temporal factors, since minds are non-spatial. Rather it is a kind of *sui generis* singular relation that holds between an individual and the system that generates it, which then provides the basis for selective interaction. The idea is that groups of particles have special powers of this sort: if this group is the first stage of a swarm that is good enough (e.g. sufficiently well-organized) to generate a mind, then it will generate and selectively interact with the particular mind \( x \); if this other group (in some cases, overlapping in membership with the first) is the first stage of a swarm well-organized to produce a mind, then it will generate and selectively interact with mind \( y \); and so on. (Swarms must, of course, be understood nihilistically.)

This appears to both solve the causal pairing problem and drastically reduce the number of individualistic powers the dualist needs to attribute to particles and swarms of them. The plausibility of this proposal is also raised by the fact that it provides the dualist with a skeletal developmental story of how minds and bodies initially hook up. To see that this goes a long way toward reducing the number of dispositions we need to ascribe to particles or swarms of them, consider the kinds of disposition in play: excepting these special dispositions to generate particular minds when working together with other particles in the first stage of a (mental) life, individual particles would only need to have a general disposition to interact with whichever mind is already interacting with a swarm into which they merge. Thus, on this picture, on top of whatever dispositions we need to ascribe to particles and swarms to explain physical phenomena, we would only need (i) individualistic dispositions of swarms specifying which particular mind that group of particles would generate if they were working together at the beginning of a life, and (ii) just a general disposition on the part of each particle to interact with whichever mind is associated with a swarm into which it is drawn.

If this proposal works, then it provides a pleasing resolution of the difficulties I have unearthed for the dualist. But, as we shall see, it is not without its costs. Given metabolic turnover, the particles that play their part in the group of particles that is one’s body will be constantly changing. On this picture, the original group of particles generates and has a singular relation with a particular mind, but because of metabolic turnover, the members of this group are soon scattered around the world and no longer play their original roles in the generating swarm. It is implausible to say that the scattered original group of particles continues to function as that mind’s body, as we would then be committed to some minds having scattered bodies; thus groups of particles (each overlapping in members with its predecessor) take their turn to function as one’s body. But how is it possible for there to be selective interaction between these later swarms and the mind, once the generating swarm starts to become scattered? After all, the

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30 Barry Loewer and Dean Zimmerman independently suggested this response to me.
singular relation holds between the generating swarm and the mind. Since we are working within a nihilist metaphysics, the best answer that the dualist can give is that certain historical facts about the swarm and the mind—that this mind was connected up with a swarm of which this swarm is a descendant—account for the current connection. The dualist will further bolster his response by pointing to there being a local explanation, and a continuous path of causal connections back to the initial hook up.

It is, however, unclear that this allows for the possibility of selective interaction between the descendants of the generating swarm and the particular mind in question. Whilst it is true that the current swarm is a descendant of the generating swarm and there is a continuous path of causal connections between earlier and later swarms, the dualist has yet to show that later swarms can selectively interact with the particular mind generated by its first ancestor. Consider the dispositions that we have ascribed: the generating swarm has individualistic dispositions toward the mind it generates and individual particles have general dispositions. Here we only have materials to explain how the generating swarm can individualistically interact with a mind, and then only when those particles remain in close proximity and are appropriately organized. (We can also explain how other particles can interact with that mind by joining that swarm.) If we add historical facts about the current swarm and a continuous path of causal connections to this, we can at best explain how the current swarm is a descendant of a swarm which once generated a particular mind and could individualistically interact with it. I cannot see how the dualist can claim to have allowed for selective interaction for descendant swarms unless he has unwittingly slipped into a non-nihilist metaphysics or has begged the question of how individualistic interaction is possible on a nihilist metaphysics. It is hard to see how a series of swarms can individualistically interact with a particular mind—where the only basis of this is the ability of the generating swarm that they are descendants of to interact selectively with that mind—unless the dualist is implicitly thinking of an entity that can survive changes of parts that selectively interacts with the particular mind in question. I discuss the consequences of individualistic dispositions for non-nihilist metaphysics of bodies in what follows.

Furthermore, even if the dualist solution here can be squared with a nihilist metaphysics, it cannot be squared with another dualist commitment: the possibility of a soul’s switching bodies. Assuming the dualist solution works, the generating swarm and its descendants are directed at one particular mind, and that mind can only interact with the generating swarm and its descendants. Thus, the dualist has undercut the need for every swarm to be dispositionally sensitive to every possible mind by positing a singular relation that restricts interaction to a generating swarm plus its descendants and the generated mind. This leaves dualists with a dilemma: they have to either give up the possibility of body change or abandon individualistic dispositions—on pain of losing their solution to the pairing problem. Once again, there is a tension in understanding the
individualistic interaction of a swarm-series and a mind in purely nihilistic terms. The possibility of body change for dualists who buy into individualistic dispositions is explored in more depth when we turn to consider a commonsensical metaphysics of bodies, on which bodies can survive changes of parts.

(B) Mereological essentialist metaphysics. On this the body is a mereological sum of particles that are close together and fill a body-shaped region. A theorist who acknowledged metabolic turnover and also held such a metaphysics of bodies would have to accept that we are constantly switching bodies—since, first of all, a body is identical with a mereological sum of particles; secondly, given metabolic turnover, the particles that constitute a body are constantly changing; and, thirdly, a difference in the particles means that we have different mereological sums. Thus on this account we are constantly changing bodies.³¹ (The rate of body change is roughly the same as the rate of metabolic turnover.) The consequence of this is that minds have to be able to interact selectively with a whole range of different bodies, and bodies have to be able to interact selectively with all possible mental subjects that can potentially be embodied. Another way to arrive at this consequence is to note that on this account it appears to be possible that you have the body that I have now at some later time (possible, I say, however vanishingly low a probability such an event has). Given this possibility, one and the same body has to be able to interact selectively with both your mind and also mine. Once again, we are faced with a scenario on which we have a 'combinatorial explosion' of dispositions.

One might respond that the dualist should rather be committed to the persistence of a person's body over time (as the person's body, rather than as a scattered object) so that each person's soul interacts with only one body throughout the person's lifetime. But, as we have seen, this is impossible to square with a mereological essentialist metaphysics of the body—given metabolic turnover. A theorist with such a commitment would have to opt for a metaphysics of bodies on which they are not mere sums but can survive change of parts. This brings us to the next case.

(C) Commonsensical metaphysics. Finally, on this the body is coincident with yet distinct from the body-shaped particle swarms that constitute it; and it can undergo change of parts. One might think that the root of the problem is due to nihilist or mereological essentialist metaphysics of bodies, rather than the individualistic dispositions; but let us see if the undesirable consequences disappear if we move to a commonsensical metaphysics of bodies. On this picture, the mind interacts selectively with a body that is distinct from yet coincident with the material particles that constitute it, but which is such that it can survive change of parts.

³¹ See Chisholm's Person and Object (La Salle, Ill.: Open Court, 1976). He is fully aware of this consequence of his mereological essentialism.
There are a number of questions we might have about bodies on such a metaphysics. Are they material entities? This might strike one as a rather odd question, since the status of bodies as material seems to be as good as that of any other kind of medium-sized ordinary object, like tables. But if it is a general feature of material entities that mereological supervenience holds of them (i.e. the properties of the whole are fixed by the properties and relations characterizing its proper parts), then bodies are not material entities, for mereological supervenience appears to fail for bodies. It seems that there can be a difference in the properties of a body without a difference in the properties of material particles which constitute it. This is a consequence of their possessing individualistic dispositions: there appears to be no reason why the same group of material particles with the same properties, including the same organizational structure (spatial arrangement, etc.) might not come to constitute a body qualitatively identical in every way to another body but with individualistic dispositions directed at a distinct individual. In other words, fixing the material particles and their properties doesn’t fix the properties of the body.

But placing the burden of individualistic interaction on bodies is only to move the bump in the carpet somewhere else. We no longer have the material particles as dispositionally sensitive to all possible mental subjects, but place their dispositional burden on bodies, while not disturbing the common conception of properties that material particles possess. Regardless of whether we think mereological supervenience holds for all material entities, having such a metaphysics of bodies does little to alleviate the more serious difficulty that is an analogue of the developmental problem discussed earlier. In this latter case, the developmental problem is how the mind manages to recruit a brain (in a body) to interact individualistically with it. Here, as before, we are faced with a dilemma. The interactionist can accept a ‘combinatorial explosion’ of dispositions (at the level of bodies)—for even if a body is recruited by a mind to play the role of permanent material link, it must already be dispositionally sensitive to any mental subject with which it might be psychophysically linked, on pain of not being able to interact with particular minds at all, since it has no other resources for interaction. On the other hand, one can reject the combinatorial explosion of dispositions, and be left without a solution to the pairing problem.

The interactionist may respond by asking why there has to be any ‘recruiting’ at all? In particular, why can’t he suppose that—as a matter of brute fact—there is for each actual or merely possible body exactly one actual or merely possible mind, the only one with which this body could possibly have causal commerce?

This brings us to a wrinkle that underscores certain distinctive modal features of individualistic dispositions (laws).³² If it is a law that *this* very body here (call it *Bob*) is the thing that causes changes in my mind (call it *Mob*) then it seems that even God couldn’t have given me a different body, since they are connected

³² Paul Snowdon brought this modal wrinkle to my attention.
by various individualistic laws. Surely, we do not want a view of this world on which it *bad* to be this body, Bob, that was causally linked to me.

The interactionist might respond that since God made it a law that Bob individually interacts with Mob, surely God could have made a different law linking me to a different body. It is not clear what this means, but even if we permit that God could have written the Book of Laws in such a way that I was linked to a different body, given the *actual* individualistic laws, it is not at all clear that Cartesian minds are permitted to change their bodies—which is an intuition of distinctness from one’s body that Cartesians tend to find fairly robust (that is, the intuition that *this* mental life may persist despite changes of body)—even though Cartesian minds may (on standard accounts) be disembodied.³³ Now, the interactionist may allow for body change if he posits individualistic laws with greater complexity. In particular, couldn’t God institute nested individualistic laws, such as ones saying that mind \( x \) interacts with body \( y \) until \( y \) is destroyed (or some other event happens), and then \( x \) interacts with body \( z \) (etc.)? This strategy for allowing body change, however, undermines the earlier interactionist response (that—as a matter of brute fact—there is, for each actual or merely possible body, exactly one actual or merely possible mind with which it could possibly have causal commerce) which was meant to undercut the need for a body to be dispositionally sensitive to all mental subjects to which it can potentially be linked.

Thus either no body change is possible—contrary to Cartesian intuition—or body change is possible. If body change is possible and assuming, as before, that psychophysical interaction cannot alter the nature of bodily entities, we are back with the dilemma of either accepting a ‘combinatorial explosion’ of dispositions for bodies or lacking a solution to the pairing problem. For a body recruited by a mind to play the role of a permanent material link must already be dispositionally sensitive to any mental subject with which it might be psychophysically linked, on pain of not being able to interact with particular minds at all—since it has no other resources for interaction.

I conclude that insofar as the interactionist uses individualized dispositions to solve the pairing problem, he has to be committed to the existence of *some* material entities—whether they be all the fundamental particles that feature in the bodies of sentient creatures or medium-sized material objects—that are

³³ Note that my point only requires the Cartesian intuition of distinctness—*this* mental life being able to persist beyond *this* very body—and not the stronger intuition of disembodiment, which plays no role in this argument. It is important to note that distinctness of mind and body is a (far) weaker thesis than their independence. To see this, consider the Kripkean thesis that because of the persistence of mental phenomena despite possible radical changes in the realizing physical phenomena, the mental phenomena of the creatures in question are not necessarily identical with, and thus not actually identical with the realizing physical phenomena (given the necessity of identity). Here, whilst mental phenomena are distinct from their physical realizers, they are surely not independent of them, for otherwise mental phenomena wouldn’t be realized by physical phenomena.
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dispositionally sensitive to each and every sentient creature with which they might possibly interact (or having to surrender the Cartesian intuition of distinctness). This is a radical departure from both our ordinary and scientific conceptions of matter and material things. I submit that this is a heavy cost that must be paid by the interactionist of Foster’s stripe.³⁴

³⁴ That Cartesian psychophysics is committed to radicalizing at least certain parcels of matter is a point that Descartes clearly saw but was lost on the tradition. The issue arises in a slightly different way within Descartes’s framework but also relates to embodiment. In the Sixth Meditation and elsewhere, Descartes discusses substantial unions and phenomena associated with them such as imagination and bodily sensations. These phenomena, however, can neither be understood as modes of thought nor as modes of extension. Thus substantial unions bring some new metaphysical and phenomenological facts in their train—which are over and above those that characterize material and mental substances considered separately.

The commitment on Descartes’s picture to radicalizing certain parcels of matter can be illustrated as follows. On his ‘primary attribute’ conception of substance, extension is the attribute through which all other attributes of material substances must be understood. A natural development of this is to see the material world as a single extended continuum. (This comes out clearly in Spinoza’s development of Descartes’s metaphysics of substance.) However, substantial unions impose a constraint on the individuation of bodies. This is because of their bringing some new metaphysical facts in their train. This in turn has the consequence that certain parcels of matter—those that enter into substantial union—acquire a special status, since they can no longer be solely understood in terms of extension. Thus, bodies of minds are the only perturbations on the material fabric that cannot be ignored. Here I am indebted to discussion with Michael Martin. (See John Cottingham’s “Cartesian Trialism”, Mind, 94 (1985), 218–30 for discussion of these issues. Although there is a question as to how Descartes can accommodate the distinctive characteristics of substantial union on his official metaphysics and epistemology of substance, there are no good textual grounds to support a ’trialist’ interpretation of Descartes.)

³⁵ Besides Descartes’s arguments to this conclusion, which are generally discredited, I know of two arguments to this conclusion by John Foster (The Immaterial Self, 206–12), both of which are, I think, ineffective. (At the start of the chapter entitled “On the Mental Self”, he claims to have already shown that mental things are devoid of any physical properties, including location in physical space. I do not think this is true, unless he means that he has refuted all extant versions of materialism, including some weak variety of token identity. And even so, that all versions of materialism are false doesn’t imply that mental things are devoid of all physical properties—unless he is illicitly assuming Descartes’s ‘primary attribute’ conception of how to understand substances.)

The first of Foster’s two arguments is trivial. He defines a basic mental subject as something which figures as a mental subject in the conceptually fundamental account of the metaphysically fundamental reality. A mental subject is anything which has mental states or takes part in mental activities. Given that he has refuted all extant versions of materialism, the obvious hope for an account on which a corporeal thing might be a basic mental subject will be a causal account; so something like direct causal interaction must take place between corporeal thing and mental states.
immaterial substances were exiled from space). It would seem that if immaterial substances were spatial, they would be subject to spatial exclusion principles (this seems to be an essential part of our conception of denizens of space and the spatial)—principles analogous to those applicable to material objects, such as: no two material objects of the same kind can occupy the same place at the same time. Admittedly, placing immaterial substances in space does not then place them in direct spatial competition with material objects; they are not material objects (and a fortiori not the same kind of material object as any other material object), and hence there is no bar to them being at the same place at the same time as a material object. But, as Colin McGinn points out, questions concerning whether an analogous spatial exclusion principle applies to mental objects seem to be misconceived: Can two thoughts be spatio-temporally coincident? Can two mental subjects be in the same place at the same time? Though nothing about the mental seems to rule out spatial exclusion principles applying to them, the fact that questions about spatial exclusion which seem constitutive of our concept of the spatial (and spatial occupancy) strike us as awkward when applied to the mental suggests that the application of spatial concepts in the mental realm is at best tenuous (the best case to be made for spatial properties is perhaps that of bodily sensations, because they seem to be directed at a part of the body). Perhaps the motivations of the interactionist who retreats to placing immaterial substances in space would be better served not by placing them in space as such but rather by placing them in the kind of quasi-spatial fabric that we earlier suggested as a scenario on which interactionism might be intelligible. This solution, however, is only a beginning, for an interactionist who attributes quasi-spatial properties to immaterial substances has at best an answer to the first query raised for interactionists, and still needs to answer the question: How is the specificity of embodiment to be secured?

But then, the argument goes, _ex hypothesi_, this will not be a basic mental subject; because it doesn’t figure as a mental subject in the philosophically fundamental account.

The second argument is that, given the falsity of token identity—i.e. given that mental events are non-physical—there is no objective fact of the matter which thing is in pain. He thinks you could in principle assign pain to any corporeal thing and not make any objective error. That’s absurd; so corporeal things couldn’t be mental subjects. But I see no reason why mental ascriptions cannot be made on the basis of weaker assumptions than token identity, such as appropriately weak supervenience principles, where certain physical systems (possibly larger than individual bodies) are identified as the supervenience base of a mental system and, as such, are ascribed the mental state or event.

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37 This might involve ‘coordinating’ the quasi-spatial and spatial dimensions such that the psychophysical units can stay intact (as functioning, single causal units), depending on how the quasi-spatial framework is understood.
My purpose in this essay has not been to urge dualists to give up the ghost, but rather to evaluate the costs of a working classical interactionist psychophys-ics. We began with certain vague worries associated with traditional scepticism about psychophysical interactionism and saw how Foster crystallized this into a problem about how causal interaction between non-spatial immaterial substances and material substances is possible in the absence of an external pairing relation such as space. In formulating the problem for interactionism in this way, Foster isolates the substantial issue that is behind traditional scepticism. We developed a doubt about the non-spatiality of immaterial substances into a general problem concerning constraints on causation. There we examined Foster’s solution to the stark question that he posed for classical interactionism. The ingenuity of the solution—in terms of individualized laws—rests on its simultaneously undermining the nomological assumption whilst still securing the specificity of embodiment. Alas, this appears to conflict with our conceptual commitment to the *generality* of causation—that the causal relation holds between two entities in virtue of the *kinds* they fall under as opposed to *which particular things* they are. I then brought out the costs of embracing a metaphysics of individualized laws: if the theorist of individualistic laws is to accommodate the empirical fact of metabolic turnover, he has to be committed to certain radical claims about the nature of human bodies and matter in general.

Foster has posed in the deepest way how we should understand the problem of classical interactionism, and hence puts us in a position to see why his solution does not work. He still faces—in Merleau-Ponty’s ironic turn of phrase—“the problem of how to give the soul a chance of feeling its body”.

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VIII