

*Non-Reductive Physicalism and the Mind Problem*¹

SUSAN SCHNEIDER
University of Pennsylvania

Most answers to the mind-body problem are claims about the nature of mental properties and substances. But advocates of non-reductive physicalism have generally neglected the topic of the nature of substance, quickly nodding to the view that all substances are physical, while focusing their intellectual energy on understanding how mental properties relate to physical ones. Let us call the view that all substances are physical or are exhaustively composed of physical substances *substance physicalism* (SP). Herein, I argue that non-reductive physicalism (NRP) cannot uphold substance physicalism and is thereby false. For NRP faces a *mind problem*: its commitment to property irreducibility prevents that which bears the mental properties—the mind, or on some views, the self or person—from being a physical thing.

Nowadays, the question of whether minds are physical is often viewed as being settled in favor of the physicalist; what is viewed as being up for debate is whether, given that all substances, and indeed, all particulars, are physical, mental properties are reducible to physical ones.² Of course, one can appreciate why the non-reductive physicalist is so obsessed with properties: her favored psychophysical relation (e.g., supervenience, realization) is to perform amazing feats—it is to permit mental tokens to be causally efficacious, be compatible with the irreducibility of mental types, and establish that mental properties are ontologically dependent on physical ones. These desiderata strike many as being difficult to jointly satisfy, so it is not surprising that our attention has been drawn to debates over psychophysical relations.

Yet we are not doing the mind-body problem any justice by assuming that the topic of substance can be settled and thus segmented off while we focus our energy on properties. For one's stance on mental properties constrains the range of positions on the nature of mind one is permitted to occupy, as we'll

see. My task today is to illustrate that non-reductive physicalism's approach to the mind-body problem will look quite different—indeed, incoherent—once its position on substance is better understood. Recall that non-reductive physicalism holds, *inter alia*:

(NR) *Property Irreducibility*. Mental properties are not reducible to physical properties.

I will urge that NRP's commitment to property irreducibility undermines (SP). Unless the non-reductive physicalist can respond to the mind problem, arriving at a genuinely physicalist approach to the nature of mind, it must be discarded. It is no physicalism worth having.

Elsewhere, I argue that a property dualism based on the view that qualia are irreducible features of the universe, such as David Chalmers' "naturalistic dualism," cannot accept substance physicalism (Schneider 2011a and forthcoming a). Today, I raise a similar argument in the context of NRP, a position that, in contrast to qualia-based property dualism, generally upholds the metaphysical supervenience of mental properties on physical ones. While naturalistic dualists move to their dualism on grounds of the irreducibility of consciousness, the non-reductive physicalist generally does so because she believes that a given mental property is multiply realizable by different kinds of physical properties. And unlike the naturalistic property dualist, advocates of NRP often endorse a functionalist characterization of mental properties, rather than emphasizing functionalism's inability to capture the essential nature of qualia. Relatedly, non-reductive physicalists tend to adopt a token identity thesis, that is, although they reject type identity, they contend that all mental property tokens are identical with physical property tokens.³ This metaphysical picture is one that is frequently presupposed by advocates of computational theories of mind, although non-computationalists adopt it as well.⁴ Although I will not presuppose a computational approach, one ambition of this paper is to urge that advocates of NRP, computationalists included, desperately need to attend to the nature of mind.⁵ The leading view of mentality is—quite ironically—guilty of neglecting the mind itself.

More specifically, I will argue that NRP is false when "substance" is defined in accordance with either of the two currently leading views of the nature of substance: the bundle theory and the substratum theory. The problem is that both theories consider properties to be metaphysical constituents of substances; that is, properties are part or all of the metaphysical nature of the substance. So that which bears the mental properties (the mind) is not a purely physical substance; minds turn out to be substances that have irreducible mental properties as constituents. As a result, either minds are "hybrid substances," having both physical and non-physical properties as constituents, or a "Cartesian" mind-body dualism obtains (that is, a dualism in which the mind has no physical properties whatsoever). I then argue

that the hybrid case, like the Cartesian one, is a form of substance dualism. In either case, minds are not physically kosher. Hence, unless a different understanding of substance is appealed to, (SP) will turn out to be false. However, NRP doesn't have other feasible positions on particularity to turn to—insofar as it locates a suitable bearer of mental properties, that bearer turns out to be non-physical. The upshot is that NRP urgently needs to locate an independently plausible conception of the nature of mind that is compatible with its appeal to substance physicalism. If it cannot manage the mind problem, it must be discarded, for it is not a physicalist position at all.⁶ Not only does this mean that NRP is false, it means the debate over substance dualism is hardly over, not even among those advocates of NRP who vehemently reject Cartesian dualism. For surprisingly, the mere commitment to property irreducibility opens the door to substance dualism.⁷

I will proceed in the following manner. Section 1 argues that if the category of substance is defined in accordance with the bundle theory then (SP) is false. Section 2 then extends the argument to the case of the substratum theory. Section 3 responds to an important reply to the mind problem that appeals to token identity or certain other psychophysical relations, such as constitution. Section 4 then discusses other approaches to particularity that NRP might appeal to in order to avoid the mind problem (e.g., Davidsonian events, neo-Aristotelian substances). Unfortunately, each approach is either flawed or unable to do the needed work of rendering NRP's substances physical.

1. Mind as Substance: from the Bundle Theory to Substance Dualism

Let us begin by asking: what is the nature of substance? Contemporary debates over the nature of substance generally revolve around the plausibility of two leading theories: the bundle theory and the substratum theory (Armstrong 1989; Loux 2002; Schneider 2011a). Both approaches are similar insofar as they hold that substances are not ontologically basic; instead, the category of substance reduces to (*inter alia*) properties, where such are either tropes or universals.⁸ This kind of reductive approach has obvious appeal, so it is not surprising that both positions have a distinguished history.⁹ For consider that when we conceive of an object what comes to mind are its features. In keeping with our initial impression that an object's properties are key to its nature, both of these conceptions of substance hold that properties are individuating. But beyond this point of agreement, there are important differences. According to the Bundle Theory, substances are bundles of the properties they possess. Of course, not every bundle of properties is an object, so we should ask: what unites bundles that are *bona fide* substances? Here, the bundle theorist suggests a relation called "compresence" (or "co-instantiation", "togetherness", "collocation"), where the compresence relation is usually taken as primitive.

In contrast to the Bundle Theory, the Substratum Theory holds that objects' natures are not exhausted by their properties. Over and above their properties, substances have substrata, a core that bears properties but is not itself a property. As our sensory access to objects is through their properties, substrata will seem rather mysterious: indeed, Locke comments that they are something "I know not what" (1689, II, xxiii, §2). So why should we believe in them? Belief in substrata comes from appreciating deficiencies in the bundle theory; most prominently, the compresence relation has been notoriously difficult to specify (Goodman 1966; Armstrong 1989, 70–72, 1978, Ch.9, Sec. IV; Russell 1948, 312). Further, if all there is to an object's nature are its properties, then it would seem that objects are repeatables, at least insofar as universals are bundled, instead of tropes. For consider a bundle theory that draws from Armstrong's theory of sparse universals. If two entities have all and only the same sparse universals, they would be the very same individual.¹⁰ Of course, the debate over this matter is nuanced, depending, for instance, on what sort of properties one is willing to countenance as being suitable to figure in the bundle.¹¹ But suffice it to say that many, including Armstrong himself, believe that substrata are needed to solve this problem, as well as others arising for the Bundle Theory (Armstrong 1989).

We do not need to decide between the bundle and substratum views herein. What is crucial for our purposes is that on both of these leading conceptions, and when properties are construed as being either universals or tropes, given NRP's commitment to property irreducibility, (SP) is false. Let us first consider the mind problem as it arises for the bundle theory. Consider: Why is the mind, which is constituted by irreducible non-physical properties, really a physical substance at all? That is, why is it that a physical bundle instantiates the mental properties, since, according to the bundle theory, there would be a bundle that has irreducible mental properties as *constituents*? Now, if you reject (SP) for the type identity theory, this problem will not arise for you, for the same substance has both kinds of features because mental properties are just physical ones. But we are assuming that mental properties are irreducible, so there is a categorical divide between mental and physical properties. And given this, if substances are indeed bundles, it is important to ask: if non-physical properties are constituents of the bundle, why would the bundle be entirely physical? Why is the mind not a "hybrid" substance—one that consists in both physical and mental properties? Or why are there not two "Cartesian" bundles instead: a physical one (the brain) and a non-physical one (the mind), each being composed of physical and mental properties, respectively? (Schneider 2011a.) (Of course Descartes was not a bundle theorist. But if the reader will permit me, I shall call such substances "Cartesian" to stress that this sort of position holds, with Descartes, that any substance suitable to bear mental properties is unsuitable to bear physical ones, and vice versa).

Here, the critic may retort: So what? One can grant that substances are hybrid, insisting they are physical nonetheless. For a physical substance can instantiate both mental and physical properties. But notice that the present point is not that the substance *instantiates* properties of both types; the point is that a hybrid substance is *constituted* by both types of properties. *And a substance is not physically kosher if it contains a metaphysical constituent that is not.* By way of illustration, consider a panpsychism in which all fundamental substances (e.g., loops or particles) have *sui generis* phenomenal properties. If you ask me this isn't a substance physicalist position: even setting aside the bundle theory, it is difficult to see why the loop or particle would be physical if it instantiates a phenomenal property that is ontologically fundamental. But the critic would surely recur to his or her original point—the particle or loop is physical because (again) a physical particular can instantiate a non-physical property. But notice that if you add to my claim the assumption that substance natures are determined by their properties (as per the bundle theory) it is hard to avoid the conclusion that the loop or particle is not entirely physical. The loop or particle is partly physical, sure. But it is also partly mental. But (SP) is not true if loops have irreducible phenomenal entities as *constituents*: for the substance does not supervene on physical properties, but on physical properties together with phenomenal ones. After all, consider, by way of comparison, a view of persons in which a person is a composite of an immaterial mind (or soul) and physical body. (A view of this sort was held by St. Thomas Aquinas, and some claim that it was Descartes' position, although this is controversial.) No one would suggest—at least with a straight face—that because such persons are “partly physical” that the person is nevertheless a physical substance. A non-physical entity is a metaphysical constituent.

This is not substance physicalism then. Indeed, to press the matter further, it is a form of substance dualism. For according to the hybrid conception, reality contains two kinds of substances: substances that physics identifies as fundamental (physical substances) and hybrid ones (minds).¹² You may object that hybrid substances are spatiotemporal, not immaterial; non-physical substances must be immaterial. But a substance dualist need not accept Descartes' view that mental substances are immaterial, being unsuitable to bear any physical properties whatsoever (Schneider 2011a). For example, consider the non-Cartesian substance dualism of E.J. Lowe, which holds, with Descartes, that the self is distinct from its body or any part of it, yet (in Lowe's words) “. . . does not insist either that the self is separable from anything bodily or that it is spatially unextended. It allows, that is, that the self may not be able to exist without a body and that it may be extended in space, thus possessing spatial properties such as shape, size, and spatial location” (2006, 8). Lowe's self is regarded as a non-physical substance, having certain physical properties yet not being reducible to any purely physical substance.

But let us suppose that the non-reductivist can effectively argue that hybrid substances are physicalistically kosher. A further problem arises. For if Cartesian dualism is to be avoided—and the non-reductive physicalist will surely wish to do so—one must explain why a hybrid mental/physical substance qualifies as a *bona fide* substance. For as Jaegwon Kim has pointed out to me, here, the non-reductive physicalist faces an important explanatory task: he or she needs to illustrate why mental and physical properties can even be compresent in the same bundle.¹³ For suppose that you are boating off the coast of Santorini. Why aren't the states of your brain that realize your mental states of seeing the glistening water part of a solely physical bundle, being instantiated by a different substance than that which instantiates by your mental properties? Why are the physical properties able to be compresent with the mental properties? After all, not every property can be compresent in the same bundle as every other. Consider any property and its negation, or consider properties that cannot be coinstantiated as a matter of law (e.g., a particle's both having mass and traveling at the speed of light). Of course, Descartes famously claimed that mental and physical properties cannot be coinstantiated. While many reject Descartes' bifurcation, the non-reductive physicalist who defends hybrid substances should at least explain why hybrid mental/physical substances of this sort are possible. One cannot merely stipulate that hybrid substances are suitable bearers of non-physical properties, or physical ones, for that matter (Schneider 2011a). And the non-reductive physicalist certainly would not want to leave this matter undecided, for he or she would face the charge that NRP leaves substance natures indeterminate—mental properties may, for all we know, only be instantiated by immaterial minds.

At this point one may wish to avoid the mind problem altogether by denying that mental properties are constituents of minds. It is hard to see how the non-reductive physicalist could maintain this—NRP is inspired by the metaphysical and explanatory import of mental properties. It is difficult for a realist about thoughts and minds, as the non-reductive physicalist is, to say that mental properties are not essential to the nature of mind. On the one hand, NRP aspires to establish mental properties as causally efficacious and essential to psychological explanations. Yet on the other hand, mental properties are somehow not even part of the mind's nature, despite the fact that a theory of substance is in force which takes properties to be constitutive of substances. We are certainly owed an argument for this puzzling position.

Here is one route toward denying that mental properties constitute minds, and although it still faces the objection of the previous paragraph, it is still worth considering. Consider an advocate of NRP who claims that the mind is identical with the brain, and who further contends that when it comes to the matter of substance individuation, only physical properties are individuating, where "physical property" is taken strictly, referring only to properties figuring in the laws of a completed physics. This non-reductivist

says that although the mind/brain instantiates mental properties, physical properties have a sort of ontological priority *vis-à-vis* substance natures: only physical properties are metaphysical constituents of the mind/brain.¹⁴ This position faces serious difficulties. First, it is not clear that the mind/brain is essentially the matter that comprises it, for a reasonable case can be made that a higher-level entity, such as the mind/brain, has different persistence conditions than any configuration of matter that comprises it. For it is uncontroversial that the brain and body are at any given moment eliminating old cells and growing new ones from new materials. Insofar as one is willing to grant that physical substances do survive over time, it is hard to deny that the brain and body can survive without some, or arguably even all, of the matter that makes it up. Second, it is important to bear in mind that the non-reductive physicalist generally accepts the metaphysical supervenience of a substance's mental properties on its physical ones. So in every possible world, when the physical properties of the mind/brain are fixed, so too are the mental properties. It is difficult to see how mental properties are not essential to the mind/brain then. But now, the mind problem reemerges.

Pursuing another tactic, perhaps the non-reductive physicalist should simply eliminate minds from her ontology, saying that they are not ontologically serious entities, being instead shorthand for talk of mental properties. It is difficult to envision how the non-reductive physicalist would justify this position in light of her larger aim of carving out an important ontological niche for the mental. In any case, this position is problematic. For what is the bearer of the mental properties if not the mind? The self? The person? Where there are properties there must be bearers. If the bearer is the person or self then the same issue arises: why isn't the bundle that is the person or self, being individuated by non-physical properties, non-physical? Perhaps the non-reductive physicalist would take a deflationary view of persons and selves as well, saying that there are no such entities and that furthermore, brains are the bearers of the mental properties. Of course one would owe us an extensive argument for an eliminativism about selves, minds and persons in the face of any acceptance of realism about other macroscopic objects. But even setting this aside, why are brains themselves really entirely physical if, as per the bundle theory, irreducible mental properties are constituents?

2. From the Substratum Theory to Substance Dualism

I suspect that this situation may lead the non-reductive physicalist to discard the bundle theory altogether, appealing to the substratum theory instead. However, given the considerations raised in the context of the bundle theory, it is natural to ask whether, on the substratum view, minds will turn out to be entirely physical. For recall that the substratum theorist's substances also

have properties as constituents; the non-reductive physicalist will thereby need to establish that minds are not hybrid or Cartesian substances.

Because the substratum view, like the bundle theory, takes properties as metaphysically constitutive, not surprisingly, the same objections and replies that we just entertained arise for the substratum theory. I will not rehash them. But moving beyond these issues, you may suspect that the substratum view has an additional resource at its disposal to answer the mind problem that the bundle theory lacks. For couldn't one insist that only physical properties individuate the substance because the substratum itself is physical? We've observed that substrata are mysterious. Can one even say more about their nature above and beyond that they bear properties and serve to individuate the substance, together with the properties? One cannot say very much; but D.M. Armstrong distinguishes two ways of saying a bit. (i) *Strong haecceitism* is a view that "...holds that a and b each have a unique inner essence, a metaphysical signature tune as it were, something apart from their repeatable properties... which distinguishes them (1989, p. 59). (ii) In contrast to strong haecceitism, "weak haecceitism" denies that substrata have inner essences of this sort; instead, substrata differ *solo numero* (Schneider 2011a). As Armstrong notes, "[t]here is certainly no call to think of haecceity as a unique inner nature or essence possessed by each particular, something property-like, although a property necessarily limited to one thing... When we have said that different particulars are numerically different, then we appear to have said all that can be said about the nature of particularity" (1997, p. 108).

Would either positions (i) or (ii) deliver substance physicalism to the non-reductive physicalist, supporting a view in which the substrata themselves are physical? I will consider each option in turn, beginning with the second. On (ii), if substrata only differ numerically then whether an object can have a physical or non-physical character would be a matter of what kinds of properties it possesses. Otherwise, the substrata would not merely differ numerically; there would be some other sort of inner nature to substrata as well (Schneider 2011a). But now, as before, irreducible mental properties would seem to call for the non-reductive physicalist to adopt an ontological commitment to either hybrid substances or Cartesian dualism.

Turning to (i), if substrata have unique inner natures it is also difficult to grasp how the substratum itself, rather than the properties or substance as a whole, can be physical or non-physical to begin with. For a substratum's being physical or non-physical seems to involve its having features that different substrata can share, and substrata natures are not properties. Is there some other manner in which substrata could have unique inner natures that are physical? One cannot merely assert they are physical because they are spatiotemporal—various putative non-physical substances (e.g., Lowe's persons) have been said to nonetheless exist in space and time (Schneider 2011a). Another sense in which something is said to be physical is when it

is named in the vocabulary of a current or future physics—but physics does not speak of substrata or haecceities. Although if substrata exist physicists may unwittingly refer to them, we cannot look to physics for an identification of these entities as being within the purview of the physical in the way that we can look to physics for an identification of what the sparse physical properties are. Thus, it is difficult to avoid seeing substrata as physical or non-physical only in a derivative sense. Substrata are physical by virtue of the properties they instantiate (Schneider 2011a). This brings back to the puzzle we began with: why are substances instantiating mental properties physically kosher?

3. The Token Identity Response

But the mind problem has an easy solution, you may insist, one that applies in the context of both the substratum and bundle theories. Most non-reductive physicalists are committed to the token identity of mental and physical properties. These theorists can respond that the sense in which mental substances are non-physical is ontologically innocent: for every mental property tokening is just a physical tokening. I'll call this reply "the token identity response."

The token identity reply fails for two reasons. First, consider bundle and substratum views appealing to universals. Because the constituents of the substance are property types, rather than property tokens, even if mental property tokens turn out to be identical to physical ones, minds will be non-physical insofar as irreducibly non-physical mental types are constituents of the substance, as per (NR).¹⁵

Second, assuming that trope versions of the bundle and substratum theories are in play, surprisingly, the advocate of NRP cannot venture the token identity reply. For in the context of the trope theory, token identity becomes a reductive position. To see this, let us ask: if properties are tropes, rather than repeatables, what are property types? Here, trope theorists have taken property types to be identical with sets of resembling tropes, where resemblance is primitive (Armstrong 1889a, Ch. 6; Campbell 1981; Williams 1966). Alternately, the members of the set are said to possess a primitive distributive unity (Stout 1931). These in house differences do not matter for our purposes; what is vital is that on both views, a property type is tokened when a particular has a trope that is a member of the set. This leads me to raise a key question about trope identity: when a trope theorist ventures a psychophysical token identity thesis is this really a *non-reductive* position? Because mental types are just classes of similar physical tropes, with each trope being identical with a mental trope, this view strikes me as a reductivist one. Universals are types that are part of the fundamental fabric of reality; saying that mental and physical universals are type irreducible is saying that there is a substantive ontological difference to the world. Mental and physical predicates have distinct kinds of truthmakers, for instance. But there is no

analog with trope types: if mental tropes are just physical tropes, saying that mental and physical types are distinct is simply introducing different ways of carving up the same spatiotemporal mosaic of physical tropes. After all, the truthmakers for mental predicates are simply classes of physical tropes. So I suspect this is not a non-reductionist view; it is a form of reductive physicalism (Schneider forthcoming b).¹⁶

But notice that when we turn back to our formulation of NRP, technically, this view qualifies as being a version of NRP. Some reframing of (NR) is thus in order. I imagine that (NR) seemed acceptable to us because we were not bearing in mind that the trope theory presents a special case for NRP. When situated within a trope framework, (NRP) calls for the following alteration to (NR):

(NR') Mental tropes are not reducible to physical tropes.

What position on mental trope types is genuinely available to NRP then? It must be a position in which a mental property type is identical with a set of mental tropes, and in which mental tropes are non-identical with physical tropes. This brings us to our conclusion: the token identity response is unavailable to a trope-based NRP.

The reader may be curious as to whether the non-reductive physicalist could reformulate the token identity response in terms of supervenience, claiming that mental substances are physical because all mental properties that are part of the nature of the substance supervene on the substance's physical properties. (And a similar sort of response is available should the non-reductive physicalist wish to grant that minds and their physical substrates are numerically distinct, coincident entities, being what I've called "hybrid substances." Here, the non-reductive physicalist could insist that the mind's mental properties supervene on the physical properties of the mental and/or physical substance, so the mind is still physical, although distinct from its substrate). Notice that supervenience is not a strong enough psychophysical relation to answer the mind problem, however. For supervenience is generally agreed to be too weak for physicalism, even if it holds of metaphysical necessity. It leaves the nature of the covariation unspecified, and it is compatible with the brute covariation or emergence of mental properties from physical ones, a situation in which it is commonly agreed that physicalism about properties would be false (Kim 1998, 12).

Here, the advocate of NRP may turn to a version of NRP that holds that all mental properties are physically realized that goes beyond mere supervenience, yet which rejects token identity. Of course, "physical realization" is a term of art—we shall need a particular version of NRP in hand. So let us consider Derek Pereboom's position. According to Pereboom, mental and physical tokens are non-identical because they have different modal properties:

A respectable case can be made that higher-level entities are typically not identical with their realization bases. The ship of Theseus is not identical with its current token microphysical realization base, for it would have been the same token ship had the token microrealization been slightly different, and it will be the same ship when this microphysical realization in fact changes—the ship is in this sense token multiply realizable The same sort of argument can be run for token mental entities. Is token mental state *M* identical with *P*, its actual token microphysical realization base? Suppose that *M* is realized by a complex neural state. It is possible for *M* to be realized differently only in that a few neural pathways are used that are token distinct from those actually engaged (2002, 503).¹⁷

According to Pereboom, although token identity fails, mental tokens are nonetheless constituted by physical ones. For a mental tokening's causal powers are constituted by the causal powers of the physical tokening (2002, 500, 526–7). But, because the mental token might have been realized differently, the causal powers of the mental token might have been different. They are non-identical with those of the physical tokening then (2002, 503).

Pereboom's position deserves further reflection (see Heil 2011; Melnyk 2008). But today, I shall simply observe that it is too weak to solve the mind problem. Remember, we turned to token identity to solve the mind problem because it was supposed to render mental substances physical or at least establish that any sense in which they are not physical is ontologically innocent; although mental types are irreducible, mental tokens are identical with physical ones. But we are now appealing to a relation that is weaker than token identity. And for Pereboom's position to solve the mind problem it must be clear that mental properties are nothing "over and above" physical ones. But mental tokens are something "over and above" physical tokens, I suspect, for Pereboom holds that mental and physical tokens (and their respective causal powers) have different natures. Remember, Kripke observed in *Naming and Necessity* (1980) that mental and physical tokens have different modal properties, and concluded that token physicalism was false. Here, one may retort that Pereboom's view is physicalist about properties where Kripke's was not because Pereboom claims that a mental token is constituted by a physical token (and *mutatis mutandis*, mental causal powers are said to be constituted by physical ones). Pereboom needs to say more about constitution, however; as Andrew Melnyk points out, all that is said is that the physical event token "together with any requisite relational features" will be "sufficient" for the mental-event token (Pereboom 2002, 500). Melnyk rightly notes that this is compatible with the brute emergence of mental tokens from physical ones (Melnyk 2008, 1292). Until then, Pereboom's position cannot yield a response to the mind problem.¹⁸

But what of Melnyk's own realization-based position (called "realization physicalism")? Could it provide a solution to the mind problem? Although

Melnyk considers his view to be a form of reductivism, others may view it as a form of NRP, for as he underscores, it rejects type identity and does not even entail token identity (2003, p. 21). In his intriguing book on physicalism, and in related pieces, Melnyk proposes:

(RP) Every mental token is either:

- (1) a token of a physical state type, or
- (2) a *physically realized* state-token of some functional state type (2008, p. 1289).

Furthermore:

(PR) A token of a functional state-type is *physically realized* iff:

- (i) it is realized by a token of a physical state-type, and
- (ii) the physical state-type meets the specification in question entirely in virtue of the holding of physical laws and perhaps of other physical conditions (2008, p. 1289)¹⁹

Although “physical” and “realized” are on the right hand side of (PR), Melnyk offers further elaboration of both expressions. Melnyk claims that “physical” is to be understood in terms of current physics (2003, pp. 13–23). This is problematic: on this view, a law, property or particular figuring in a completed physics will not qualify as being “physical” if it does not happen to be within the purview of current physics. If one considers the state of play in contemporary physics, with its tension between relativity theory and quantum mechanics, and with its deep controversies over string theory, it is fair to say that current physics is likely incomplete, and moreover, certain of its claims are false. Now, the advocate of NRP can still endorse realization physicalism while conceiving of the physical in terms of a completed physics. This move seems more reasonable, but it too is problematic: we do not know what a completed physics will be like, so we don’t really know what physicalism is; indeed, for all we know, a future physics may invoke *sui generis* qualia or minds. These points are not new; this general problem has been widely discussed in the physicalism literature and is known as *Hempel’s Dilemma*. (The dilemma is that, on the one hand, one cannot define the physical in terms of current physics since certain claims of current physics are most likely false, and current physics is surely incomplete. But on the other hand, if we define the physical in terms of a completed physics, the position that the mind, and other entities, are physical is unclear, as we do not know what the content of a future, completed physics will be like (Hempel 1980; Crane and Mellor 1990; Stoljar 2010)). So, in essence, any NRP that aims to appeal to Melnyk’s realization physicalism to arrive at a

satisfying answer to the mind problem faces the daunting task of explaining what makes a given realization physical. Further, one cannot simply remove “physical” from the right-hand side of (PR) or (RP), for as Melnyk surely knows, a given realization need not be a physical one.

Now let us consider Melnyk’s notion of realization. As we’ll see, a problem arises here as well. In brief, Melnyk claims that a token *x* realizes token *y* iff (i) *y* is a token of some functional type, *F*, such that, necessarily, *F* is tokened iff there is a token of a type that meets condition, *C*; (ii) *x* is a token of a type that in fact meets *C*; and (iii) “the token of *F* whose existence is logically guaranteed by the holding of condition (ii) is identical with *y*” (2003, 21). Now, as Melnyk notes, realization is compatible with token identity: “As far as this definition goes, then, it is an open question whether a realized token is identical with its realizer” (2003, 21). While this openness means that Melnyk’s view will be attractive to more kinds of physicalists, it raises difficulties for the non-reductivist who employs it to solve the mind problem. For one thing, I’ve just observed that NRP cannot appeal to the token identity relation insofar as tropes figure as *relata*. While this observation will not concern Melnyk—again, he is a reductivist—it is clearly a problem for the advocate of NRP. In addition, elsewhere I have argued that token identity is unavailable to a proponent of NRP who appeals to immanent universals, for token identity is incoherent in absence of type identity when immanent universals are involved (Schneider forthcoming b). In a bit more detail, NRP holds that mental property types are non-identical with physical ones. Notice that immanent universals are *repeatables*, being multiply instantiable, with each token having the same inner nature as any other token of a given type. Further, tokens have the nature of their types, whether the nature is categorical, dispositional or a combination of both. As a result of this, mental and physical tokens cannot be identical—tokens of distinct types must differ in their inner natures, for such natures are determined by their respective types. Hence, if properties are repeatables, any non-reductivist appeal to token identity is ill conceived.

Upon reflection, this matter raises yet another concern with the tenability of any appeal to token identity to solve the mind problem, suggesting that the token identity relation is unavailable to the immanent realist. But let us focus on two concerns that this issue raises for the prospects of Melnyk’s realization physicalism to solve the mind problem for NRP. (i) If my criticisms of token identity are apt, Melnyk’s view cannot provide a solution to the mind problem, at least as it is currently formulated. For the realization relation must be formulated to *exclude* token identity, otherwise realization threatens to be either covertly reductive or incoherent. (ii) But insofar as the realization relation must be weaker than token identity, the proponent of NRP faces a daunting task. We have noted that to solve the mind problem mental properties must be nothing “over and above” physical ones. If a relation weaker than token identity is employed, the advocate of NRP

must show that despite the weakness of the relationship between mental and physical properties, mental tokens are still somehow nothing “over and above” physical tokens. Relations short of token identity threaten to be too weak, however; consider, for instance, our earlier observations about constitution and supervenience. So the realization physicalist must illustrate that the reformulated realization relation is still robust enough to solve the mind problem.

Now let me summarize the dialectic of the paper thus far. I have argued that the mere commitment to property irreducibility, when coupled with either leading theory of substance, yields the result that mental substances are non-physical. I have now entertained numerous responses to this basic line of argument, including attempts to deny that minds are substances, or deny that mental properties are essential to the mind. The present section observed that an appeal to token identity or various other psychophysical relations will not render mental substances physically kosher. In essence, the mind problem is quite serious: any theory of mind should be compatible with leading theories of substance, unless, that is, it has developed and defended an alternative conception. But to the best of my knowledge, non-reductive physicalists have not done so.

At this point in the game, the advocate of NRP may simply wish to ditch the leading theories of substance. So let us ask: Is there another well-received notion of substance that is available to NRP? Alternatively, is there a different category of particular that could be summoned in a version of NRP that can avoid the mind problem?

4. Other Options?

If avoiding the mind problem is the objective, perhaps the non-reductivist could turn to a notion of substance in which properties are not metaphysical constituents. This may initially strike the reader as a difficult pill to swallow, for properties seem to be part, if not all, of an object’s nature. As Armstrong points out, objects are not undifferentiated “blobs”—they seem to be made of features (1989b). An ontology that simply took objects to be primitive, denying that they have properties, as some of the cruder nominalist theories have, is unable to account for why objects have the causal powers that they do, or appear to be propertied.

But upon reflection, there is a far richer conception of substance than that of “blob” theories, and it is one that also denies that substances have properties as constituents. Here, I have in mind a neo-Aristotelian view in which substances are *sui generis* and yet are propertied, rather than being undifferentiated “blobs.” This conception of substance has been traced back to Aristotle in *Categories* 5, although Aristotle is said to have flirted with the substratum view as well. We’ve seen that reductive theories of substance take properties as metaphysical constituents of substances; in the eyes of the

Aristotelian this is suspect, however, for properties are not intelligible apart from the substances that bear them: when we grasp brownness it is always in the context of the particular brownness of something (e.g., the elm tree, the dog's coat). On the neo-Aristotelian view, substances are primitive, yet the being of a substance is grounded in certain universals (called "substantial kinds", e.g., *human being*, *elm tree*). When this neo-Aristotelian view is applied to the case of the mind, substantial kinds determine the mind's identity, and the mind possesses an organizational unity of its own (Loux 2002, Lowe 2006). The mind is in no way identical with the matter that constitutes it at a given time; the mind and its physical substrate are collocated, distinct substances. Yet the mind is not outside of the spacetime manifold, as is the case with the Cartesian conception of substance. Instead, the mind bears certain physical properties like location and mass.

This being said, can NRP appeal to the neo-Aristotelian view to avoid the mind problem? I do not believe so: the neo-Aristotelian view of the mind is not really a physicalist position, for it regards the mind as a *sui generis* higher-level substance that is not identical with the matter that constitutes it. Indeed, E.J. Lowe's naturalistic substance dualism is based on this view of substance (Lowe 1996).²⁰

Let us entertain a different tactic then. Could the non-reductive physicalist eliminate the category of substance from her ontology, reframing NRP in terms of an ontology of events? An appeal to events is unworkable, I believe. First, most philosophers appeal to a conception of an event in which events are (roughly) property instantiations (Lewis, 1986; Kim, 1993). For example, Jaegwon Kim advanced a view of events in which two events are identical iff:

(KE) X's instantiation of property P at time t = Y's instantiation of property Q at time t* iff X = Y, property P = property Q, and t = t*

Notice that (KE) will not allow NRP to avoid the category of substance as it appeals to substances in the right-hand side of the analysis, for Y is taken to be the constitutive substance. But perhaps we should simply say the following: a mental event is identical with a physical event iff the mental and physical property tokenings are identical. But this will not do: remember, we've already ruled out token identity as ill being conceived when employed in the context of NRP.

Should the non-reductive physicalist turn to a coarse-grained conception of events instead? After all, this is how Donald Davidson saw fit to frame his seminal form of non-reductive physicalism. Although Davidson rejected properties for an austere nominalist landscape of predicates, the non-reductive physicalist need not do so. Unfortunately, one's enthusiasm wanes when one recalls the problems that plagued accounts of coarse-grained events. Back in the 1980s, Davidson himself had advanced two influential

individuation conditions for coarse-grained events. Initially, he had proposed the principle that no two events can have exactly the same causes and effects. Later, he proposed that no two events can occur in exactly the same space-time zone, a view that Quine advanced as well. In a bit more detail, in “The Individuation of Events,” Davidson had proposed the following:

(DT1) $(Ax)(Ay) [x = y \text{ iff } (Az) (z \text{ causes } x \text{ iff } z \text{ causes } y) \text{ and } (x \text{ causes } z \text{ iff } y \text{ causes } z)]$ (Davidson 1980, p. 179).

Unfortunately, (DT1) is circular because, of course, x , y and z are events. The circularity is not excisable either, for the gist of Davidson’s suggestion is that events can be individuated by their causes and effects, but what is a cause or effect, for Davidson, if not an event? Davidson claims (inter alia) that events e and e' are identical only if e and e' have all the same causes. But causes are events, and to determine if e and e' have the same causes we need to determine whether each of e ’s causes has all the same effects as some cause that e' has. And among these effects are e and e' , the very events we are trying to distinguish or, alternately, identify (Lombard 1998; Schneider 2005).

Davidson eventually conceded that (DT1) is circular and, in light of this, moved to a theory that he had previously rejected in the context of discussing a proposal by Lemmon (Davidson 1980, p. 178; Schneider 2005). Lemmon’s proposal was the following:

(DT2) events are identical iff they occur in the same space at the same time.

Davidson had rejected (DT2): “. . . I thought one might want to hold that two different events used up the same portion of space-time . . .” (Davidson 1985, p. 175) Unfortunately, Davidson’s discussion of Lemmon’s proposal came back to haunt him. In particular, Davidson had provided an intriguing example involving a sphere that is simultaneously heating and spinning. (Note: when the sphere heats the same molecules are both spinning and randomly jiggling about.) The example was generally taken to show that two distinct events can in fact exist in the same spatiotemporal location (Schneider 2005). This was commonly regarded as being a decisive objection to DT2, the proposal that Davidson himself continued to favor.

In sum, these course-grained theories of events were generally discarded in favor of the view that events are property tokenings because they were viewed as facing serious problems. Yet the account of events that is now commonly accepted—one in which events are property tokenings—will not yield a form of physicalism for the proponent of NRP.

Finally, let us consider a third strategy. Perhaps the proponent of NRP could offer an *independence conception* of substance: to be a substance is to be the sort of entity that does not depend for its existence on anything else.

Formulations of this general position differ in significant ways, but the general idea is that whereas, for example, properties are dependent upon particulars for their instantiations, substances do not depend upon other substances, nor do they depend for their existence upon entities in any other metaphysical category (Lowe 1994, Fine 1995, Toner 2010).²¹ This view denies that substances have properties or substrata as metaphysical constituents, although substances are propertied. Substances are *sui generis*.

Would the independence conception yield a solution to the mind problem? This view is often ventured in tandem with the aforementioned neo-Aristotelian view of substance, in which the mind or self does not reduce to the spatiotemporal configuration of fundamental physical substances. We've already noted that this kind of position rejects (SP) (Lowe 1994, 2008; Loux 2002). If the independence conception is to be summoned to solve the mind problem, clearly, it must endorse (SP). So, a suggestion: the non-reductive physicalist could claim that the mind is a *composite* physical substance, being entirely made up of certain fundamental physical substances (e.g., particles or strings) that are *simple* substances, having no other substance as a part. And, as per the independence conception, these physical simples are substances because they are capable of independent existence.

Here, a serious problem emerges: if the mind is a composite substance, it cannot exist on its own, contra the independence conception, for it depends upon the simple substances that make it up. Proponents of the independence conception are well aware of this problem, as it arises for any sort of composite substance whatsoever. Key advocates of the independence view have responded by modifying the independence account. For instance, according to Kit Fine, a substance is "anything that does not depend on anything else or, at least, upon anything other than its parts." (Fine 1995, pp. 269–270) In a similar vein, E.J. Lowe writes: "A substance may be defined to be an object which does not depend logically for its existence upon the existence of any others distinct from itself (other than its proper parts, if it has any) . . ." (Lowe 1994, p. 534).

Unfortunately, as Patrick Toner and Penelope Mackie have observed, this modification seems ad hoc (Mackie 2000; Toner 2010). As Toner explains,

Imagine there were simple substances: souls, or physical simples, for example. These substances would not be dependent on their parts But if we suppose that there are compound substances in addition to these simple substances, we find ourselves forced to decree that, in these cases, their dependence on their parts isn't a bar to substantiality. Why not? (Toner 2010, p. 2)

Toner's point seems apt. For the independence account's essential claim is that substances are the sort of entity that are able to exist on their own. But the proposed modification says that this is incorrect in the case of composite substances—unlike simples, they are dependent entities. Why are

they nevertheless substances, if they are dependent on their parts? This move seems *ad hoc*. Further, why are simple and composite substances even of a single ontological category if they differ in a dimension that the independence conception values so highly—their independence? In sum, without further explanation on the part of the proponents of this view, we should be wary of this response, for it seems to violate the spirit of the original account.²²

In addition to this concern, I suspect that few advocates of NRP will find the independence conception attractive. For I've observed that the category of substance is generally viewed as a reductive category, consisting in, *inter alia*, the substance's properties. But the independence conception of substance denies that properties are metaphysical constituents of substances. If the success of NRP depends upon a view of substance that many would reject, the mind problem is still quite serious. Of course, the independence conception may be correct nevertheless—but here, NRP must do some deep ontological soul searching, providing a spirited rejection of the two leading theories of substance and a viable case for the independence view.

5. Conclusion

Kim and others have laboriously catalogued the failure of non-reductive physicalism to explain mental causation. But who would have thought that NRP cannot even explain *minds*? Minds as bundles or propertied substrata are constituted by at least some mental properties. When substance is construed in either of these ways, on the assumption that mental properties are irreducible (as per NR or NR'), (SP) is false. Further, we found that appeals to psychophysical relations such as token identity, supervenience and realization will not render minds physical. And we've just noted that a retreat to events will not avoid the mind problem either; nor will an appeal to neo-Aristotelian substances or to the independence conception. We have thereby learned—quite surprisingly—that the mere commitment to property irreducibility threatens to lead to substance dualism. So it seems that the non-reductive physicalist must turn his or her attention to the mind problem. As things stand, NRP cannot deliver the most commonly agreed upon element of the physicalist platform: the view that all particulars are ultimately physical. Embarrassingly enough, minds outrun these.

Notes

¹ I am grateful to Jaegwon Kim, Gene Witmer and two anonymous reviewers at this journal for their very helpful suggestions.

² For instance, Jaegwon Kim writes in an influential textbook that physicalism about substances is “a starting point for discussion rather than a conclusion in need of defense” (Kim 2006, p. 274). And further: “Dualism is no longer a dualism of two sorts of substances; it is now a dualism of two sorts of properties, mental and physical” (2006, p. 51). (For similar remarks see Crane 2003 and Kreigel 2007). Of course, there are plenty of substance dualists still out

there (e.g., E.J. Lowe, Dean Zimmerman); they will point out that people are mistaken if they think the debate over substance physicalism is settled.

³ Not all non-reductive physicalists accept token identity, however. So the main arguments of the paper do not require it.

⁴ For discussion of computationalism see Schneider 2011b.

⁵ In a forthcoming book on the mind-body problem, I reframe the metaphysical commitments of positions such as naturalistic property dualism and computationalism (broadly construed to encompass both connectionism and the language of thought approach) (Schneider forthcoming a).

⁶ I frame today's discussion in terms of minds, but a similar problem arises for positions that take the bearer of mental properties to be the self or person instead.

⁷ For an illustration of this claim with respect to the case of a property dualism inspired by qualia irreducibility see Schneider 2011a.

⁸ In using the expression "substance" I do not mean "substratum." I mean the entire object, broadly construed to include both physical and non-physical substances. Some discussions of the substratum view use "substance" and "substratum" interchangeably. To keep matters clear I shall not do so.

⁹ For instance, Locke is said to have held the substratum view, and Aristotle flirted with it. Substrata are Plato's "receptacles" in the *Timaeus* (48e4–53c). Hume was a bundle theorist, embracing a trope theoretic version (1739; Book I, Part I, Section vi). Berkeley apparently held a substratum view for minds and a bundle theory for objects (1710, para. 1).

¹⁰ Bundle theories of universals take bundles to be individuated by property types, not property tokens (Armstrong, Chapter 4, 1989).

¹¹ This problem doesn't arise for a bundle theory that bundles tropes. Tropes are not repeatables to begin with. Trope theorists commonly appeal to the bundle theory of substance.

¹² Perhaps other kinds of multiply realized properties (e.g., geological, economic) are constituents of substances as well; perhaps then, the non-reductive physicalist is not a dualist but a pluralist. But this is an issue I leave aside today. For the proponent of NRP may be quite happy with an ontology in which the only real substances are fundamental physical entities (and complexes thereof) and minds. In this case, he or she may wish to deny that other kinds of multiply realized properties are constituents of substances. I respond herein to attempts by a NRP to deny that mental properties are constituents of substances.

¹³ In the context of an email interchange about a similar argument I had raised for naturalistic property dualism, (see Schneider 2011a).

¹⁴ Jaegwon Kim has suggested such an objection to me (see also Schneider 2011a).

¹⁵ I have also argued that even a universals-based NRP is not entitled to appeal to token identity. More generally, I have argued that (property) token identity is not a position that NRP can appeal to (Schneider forthcoming a and b).

¹⁶ Heil (2005) and Heil and Robb (2003) develop a similar approach to that outlined in this paragraph, but it is one that rejects higher-level properties for a functionalist account appealing to mental predicates, rather than mental properties. There are sparse physical properties, however; such are tropes with two-sided natures. Intriguingly, they illustrate the way this ontology alters debates involving mental causation and the nature of qualia.

¹⁷ Pereboom takes realization to be a relation between tokens.

¹⁸ The reader may observe that Sydney Shoemaker's recent formulation of realization physicalism also rejects token identity (Shoemaker 2009). What about his view? Unfortunately, we do not have time to discuss Shoemaker's view herein, but there have been thorough and instructive discussions elsewhere, I believe (see Kim 1010; McLaughlin 2010; Walter 2010). These discussions have led me to believe that the subset proposal will not yield a viable NRP, for it does not allow mental properties to be genuinely efficacious, as a given mental property tokening's causal powers are just a (presumably nonempty) proper subset of those of the physical property tokening. So insofar as the mental properties are physically realized at all, the physical causal powers are doing the causal work (Walter 2010). The only option here (within the framework of

NRP) is to allow that some of the physical realizer's powers are mental, but that would amount to the view that the physical properties are themselves individuated by at least some irreducibly mental causal powers. As Kim puts it: "For the Shoemaker world as pictured would include in its ontology mentalistic causal features as fundamental entities" (Kim, 2010, 111). Walter has expressed this general worry in the context of several proposals involving physical realization (Walter 2010); I am sympathetic. Remember, whatever psychophysical relation NRP appeals to in order to answer the mind problem must be independently plausible given NRP's other commitments.

¹⁹ Melnyk's 2003 formulation differs slightly (p. 23) in ways unrelated to my discussion. I'm using his most recent one.

²⁰ The main argument of the paper may apply this view in any case, for at least insofar as minds are typed by certain of their mental properties, minds would turn out to be non-physical, although, again, they would still be part of the natural world.

²¹ Contemporary proponents of this view include Kit Fine, E.J. Lowe, Joshua Hoffman and Gary Rosenkrantz. Hoffman and Rosenkrantz's joint position differs from my generic description above, but these details would require a far lengthier discussion and do not alter the gist of my objection (but see Hoffman and Rosenkrantz 2002; Toner 2010).

²² See Toner for further discussion, including a discussion of this objection in the context of Hoffman and Rosenkrantz' position (Toner 2010; Hoffman and Rosenkrantz 1994, 1997).

Works Cited

- Armstrong, D.M. (1989a) *Nominalism and Realism*, vol. 1 of *Universals and Scientific Realism*, Cambridge University Press.
- (1989b) *Universals: an Opinionated Introduction*. Westview Press.
- (1989c) *A Combinatorial Theory of Possibility*. New York: Cambridge University Press.
- (1997) *A World of States of Affairs*. New York: Cambridge University Press.
- Aristotle (1941). *Categories 5*, The Basic Works of Aristotle. Random House.
- Blackburn, S. (1990). "Filling in Space", *Analysis* 50. 62–65.
- Campbell, K. (1981) "The Metaphysics of Abstract Particulars", *Midwest Studies in Philosophy*, vol. 6., ed. PA French, T.E. Uehling, and H.K. Wettstein, University of Minnesota Press.
- (1997) "The Metaphysic of Abstract Particulars", in *Properties* (Mellor, D.H., and Oliver, O., eds.), Oxford: Oxford Univ. Press.
- Chalmers, David J. (1997). *The Conscious Mind: In Search of a Fundamental Theory*. Oxford: Oxford University Press.
- Crane, Tim (2003). "Mental Substances." In *Minds and Persons*, edited by Anthony O'Hear. Cambridge University Press.
- Crane, T. and Mellor, H. (1990). "There is no Question of Physicalism," *Mind* 99:185–206, p. 83.
- Davidson, Donald (1980). *Essays on Actions and Events*. New York: Oxford University Press, 1980.
- (1985). "Reply to Quine on Events," in *Actions and Events: Perspectives on the Philosophy of Donald Davidson*. eds. Lepore, E. and B. McLaughlin. Oxford: Basil Blackwell, pp. 172–176, 1985.
- Descartes, R. (1986). *Meditations in First Philosophy*, John Cottingham, ed., Cambridge: Cambridge University Press.
- Fine, K. (1995). Ontological Dependence, *Proceedings of the Aristotelian Society*, 95, 269–276.
- Goodman, Nelson (1966). *The Structure of Appearance*. 2nd ed., Bobbs-Merrill.
- Hasker, William. (1999) *The Emergent Self*. Ithaca: Cornell Univ. Press.
- Heil, J. (2005). *From an Ontological Point of View*. Oxford: Oxford University Press.
- (2011). "Powers and the Realization Relation", *The Monist*, vol. 94, No. 1.

- Heil, J. and Robb, D. (2003). "Mental Properties." *American Philosophical Quarterly*, Volume 40, Number 3.
- Hempel, C. (1980). "Comments on Goodman's Ways of Worldmaking," *Synthese*, 45: 193–9.
- Hoffman, Joshua and Rosenkrantz, Gary (2002). *The Divine Attributes*. Oxford: Blackwell Publishing.
- Kreigel, U. (2007). "Philosophical theories of consciousness: Contemporary western perspectives." In P. D. Zelazo, M. Moscovitch, & E. Thompson (Eds.), *The Cambridge handbook of consciousness*. Cambridge: Cambridge University Press.
- Kim, Jaegwon (2010). "Thoughts on Sydney Shoemaker's Physical Realization." *Philosophical Studies* 148 (1).
- (2006). *Philosophy of Mind*, 2nd Ed., New York: Westview.
- (2005). *Physicalism, Or Something Near Enough*. Princeton University Press.
- (1993). *Supervenience and Mind: Selected Philosophical Essays*. New York: Cambridge University Press.
- (1993). "Multiple Realizability and the Metaphysics of Reduction." In *Supervenience and Mind: Selected Philosophical Essays* (Cambridge: Cambridge University Press), 309–35.
- Kripke, Saul (1980). *Naming and Necessity*. Cambridge: Harvard University Press.
- Leibniz, G. (1951). *Monadology 17*. In *Leibniz Selections*, ed. Philip Weiner. New York: Charles Scribners Sons.
- Lewis, David (1983). "New Work for a Theory of Universals," *Australasian Journal of Philosophy* 61 (1983): 343–377.
- *On the Plurality of Worlds* (1986). Oxford: Basil Blackwell.
- Locke, John (1689). *An Essay Concerning Human Understanding*.
- Lombard, L. (1998). "Ontologies of Events" in Macdonald, Cynthia and Stephen Laurence, Eds. *Contemporary Readings in the Foundations of Metaphysics*. Oxford: Blackwell.
- Loux, M. (2009). *Metaphysics: A Contemporary Introduction*. New York: Routledge.
- Lowe, E.J. (1996). *Subjects of Experience*. Cambridge University Press.
- (2006). "Non-Cartesian Substance Dualism and the Problem of Mental Causation," *Erkenntnis*, Vol. 65, No. 1, pp. 5–23.
- (2008). *Personal Agency: The Metaphysics of Mind and Action*. Oxford: Oxford Univ. Press.
- (1994b). "Primitive substances." *Philosophy and Phenomenological Research*, 54, 531–552.
- McLaughlin, B. (2009). "Review of Sydney Shoemaker's *Physical Realization*." *Notre Dame Philosophical Reviews* (July 17).
- Mackie, P. (2000). "Review of *Substance among Other Categories*." *Mind*, 109, 149–152.
- Martin, C.B. (1980). "Substance Substantiated." *Australasian Journal of Philosophy* Vol. 58, No. 1; March.
- Melnyk, Andrew (2008). "Can Physicalism Be Non-Reductive?" *Philosophy Compass* 3 (6): 1281–1296.
- (2003) *A Physicalist Manifesto: Thoroughly Modern Materialism* (Cambridge: Cambridge University Press).
- Pereboom, Derk. "Robust Nonreductive Materialism." *Journal of Philosophy* 94 (2002): 499–531.
- Plantinga, Alvin (2006). "Against Materialism," *Faith and Philosophy*, 23:1, Jan., 3–32.
- Russell, Bertrand (1948). *Human Knowledge: Its Scope and Limits*. Allen and Unwin.
- Schneider, (2011a). "Why Property Dualism Cannot Accept Physicalism about Substance." *Philosophical Studies*, forthcoming. Available at *Online First*: no. DOI 10.1007/s11098-010-9618-9.
- (2011b). *The Language of Thought: a New Philosophical Direction*. Boston: MIT Press.
- (Forthcoming a). *The Mind-Body Problem: Rethinking the Solution Space*. Oxford: Oxford University Press.

- (Forthcoming b). “Why the Non-reductive Physicalist cannot Appeal to Token Identity”, forthcoming in *Philosophy and Phenomenological Research*. Available on Early View.
- (2005). “Events,” *The Internet Encyclopedia of Philosophy*, Nov., <http://www.iep.utm.edu/events/>
- Stout, G. F. (1921). “The Nature of Universals and Propositions,” *The Problem of Universals*, ed. Charles Landesman, New York: Basic Books, 1971: 154–166.
- Strawson, Peter (1959). *Individuals: an Essay in Descriptive Metaphysics*. (London: Methuen).
- Toner, Patrick (2010) “Independence accounts of substance and substantial parts.” *Philosophical Studies*. doi:10.1007/s11098-010-9521-4
- Walter, Sven (2010). “Taking Realization Seriously: No Cure for Epiphobia.” *Philosophical Studies* Volume 151, Number 2, 207–226, DOI: 10.1007/s11098-009-9425-3
- Williams, D.C. (1966). “The Elements of Being” in *The Principles of Empirical Realism*, Springfield Ill: C. Charles Thomas.