Mereological Nihilism and the Problem of Emergence

Abstract:

Mereological nihilism is the view that there are no composite objects; everything in existence is mereologically simple. The view is subject to a number of difficulties, one of which concerns what I call *the problem of emergence*. Very briefly, the problem is that nihilism seems to be incompatible with emergent properties; it seems to rule out their very possibility. This is a problem because there are good independent reasons to believe that emergent properties *are* possible. This paper provides a solution to the problem. I will show that nihilism and emergence are perfectly compatible, providing one accepts a novel understanding of how objects can instantiate properties; what I call *irreducibly collective instantiation.*

§1. Introduction

According to mereological nihilism (just 'nihilism' from here on) there are no composite objects. For the nihilist, everything that exists is mereologically simple, that is to say, has no proper parts. Nihilism is a controversial view and, despite something of a recent surge in popularity, it is subject to a number of serious objections. One of these objections concerns what I shall call *the problem of emergence*. In brief, the problem is that nihilism seems to be incompatible with the existence of emergent properties; it seems to rule out their very possibility. This is a problem because recent advancements in certain independent areas of study (such as the philosophy of mind and quantum physics) provide reasons to suggest that emergent properties are at the very least possible. In this paper I offer a solution to the problem. I will argue that nihilism and emergence are perfectly compatible providing one accepts a novel understanding of how properties are instantiated: what I call *irreducibly collective instantiation.* Along the way I will also aim to show that, contrary to much of what is written in the relevant literature, nihilism is not an absurd or ridiculous view, but rather, is a plausible and even compelling metaphysical thesis.

§ 2. Mereological Nihilism

Mereological nihilism is the outright rejection of the relation of parthood. For the nihilist, nothing *has* parts, and nothing *is* a part. According to the nihilist, therefore, there are no composite objects; everything in existence is mereologically simple. The nihilist's world is thus a sparse, Democritean one of just atoms and void. Nihilism is a most unpopular view. Rejected by many and endorsed by only few, it is usually viewed as being at best controversial, and at worst, absurd.[1] The most commonly offered reason for rejecting nihilism is that it flies in the face of common sense. For according to common sense, the world is simply awash with composite objects. My car, for instance, has its wheels as parts. My house is composed of bricks and mortar. I myself am made up of all manner of different parts: hands, feet, eyes, ears, and so on. These statements express common sense platitudes, it is supposed, but according to the nihilist they are all false. For the nihilist, there are no cars; there are no houses; there are not even any human beings.[2] It is for this reason – what I will call *the common sense objection* – that nihilism is often rejected out of hand as being evidently and obviously false. To give a few examples of the common sense objection in action, Michael Rea has said: "It just seems obvious that there are tables, chairs, computers and cars. The fact that some philosophical arguments suggest otherwise seems simply to be an indication that something has gone wrong with those arguments".[3] In a similar vein, Ned Markosian says: "according to my intuitions, there are simply far more composite objects in the world than nihilism allows. This seems to me to be a fatal objection to nihilism".[4] This sort of view, which is fairly prevalent in the literature, refuses to even take nihilism seriously. It is so evidently false, these naysayers maintain, that it fails to even get off the ground.

It is not one of the aims of this paper to convince the reader that nihilism is true – my arguments do not depend on it. For I am arguing only that nihilism and emergence are compatible. However, whilst my arguments do not depend on the truth of nihilism, I do think it is necessary to say something in response to the common sense objection. The reason for this is that if the common sense objection is right, and nihilism is evidently false, then the conclusion of this paper would be of very little consequence. Demonstrating that two theories are compatible is of very little interest if one of those theories is obviously false. Fortunately, and as I will presently show, I think there is good reason to be unconvinced by the common sense objection. It is simply not true, I maintain, to say that nihilism is evidently and obviously false.

The main reason for this is that the nihilist has an easy and obvious strategy for explaining the *apparent* existence of the objects he eschews. For whilst the nihilist does deny the existence of ordinary composite objects like cars, houses, and human beings, he does not deny the existence of the matter that allegedly composes those objects. For example, take an ordinary table. According to common sense, a table is a composite object made of smaller parts which are arranged in a particular fashion and stand in certain spatio-temporal relations. At base, those parts will be very, very small indeed; some kind of microscopic, fundamental particles (quarks and leptons, or what have you). Now here's the point. The nihilist can *agree* with this latter claim; he too accepts the existence of these microscopic, fundamental particles, and he too agrees about the way in which they are arranged, and the spatio-temporal relations in which they stand. All he disagrees about is that they compose a single, composite object – a table. When seen in this light, the disagreement between the nihilist and his opponents is a lot more subtle than it may initially appear.

As it happens, the debate is actually very seldom seen in this light. One of the reasons for this, and for why nihilism *seems* to be at such sharp odds with common sense is the somewhat loaded way in which the objections to it are often phrased. Opponents to nihilism are apt to say, in incredulous tones, things like: "but if your view is right, that means there are no tables and chairs!" Statements like these, when so baldly asserted, do give the impression that nihilism is patently absurd. For the claim that "there are no tables and chairs", when taken at face value, would have us believe that we have no surfaces to put things on, and nowhere to sit down; it would have us believe that the world around us is nothing but a mere illusion. But of course nihilism doesn't entail that! If it *did,* then we would be right to reject it as absurd. But as we well know, the nihilist can sit down just as comfortably as anyone else; he merely maintains that what he is sitting on is not a single, composite object (a chair), but a plurality of small, simple objects (particles arranged chair-wise).[5] Once this is recognised, the conflict between nihilism and common sense begins to lose its bite. In fact, it is not clear that there is a conflict with common sense at all, or so it seems to me. For when faced with what is ordinarily recognised as a table, for example, both parties (i.e. the nihilist and his opponent) *agree* about what physical matter lies before them (i.e. a vast quantity of microphysical particles arranged in tabular form). The only thing they disagree about is the *compositional status* of that matter, that is, whether those particles compose something. And it's not at all obvious that the compositional status of matter is something that common sense tells us an awful lot about. As an analogy, suppose you were attending a football match with a friend, and were part of a crowd fifty-thousand strong. Now suppose that both you and your friend agreed that the fifty-thousand people existed, but you

disagreed on whether there was another entity – the crowd – which those people composed. This would appear to be a legitimate debate, but it's not at all obvious what the common sense resolution to it would be. At the very least, it certainly doesn't seem *absurd* to insist that there is no singular entity – a crowd – which exists in addition to the people attending the match. It would be quite reasonable, or so it seems to me, for one to insist that there is *no actual thing* to which we refer when we speak of "the crowd", but merely the fifty-thousand individuals congregated in close proximity. To put it another way, suppose one were asked the question: how many individual objects are present in this scenario – 50,000 (just the people), or 50,001 (the people and the crowd)?[6] It seems perfectly reasonable to suppose that it is the former answer which is correct. But of course, the same could quite easily be said about a table. Thus it shouldn't seem particularly radical, or absurd, to suggest that there is no table over and above the multitude of atoms that are arranged table-wise. As Ted Sider has said, denying there are tables in addition to particles arranged table-wise "is no more absurd than denying that holes exist in addition to perforated surfaces, or denying that smirks exist in addition to smirking faces".[7] Quite so.

It is because of this that the common sense objection does not pose much of a threat to the nihilist. The postulation of microphysical simples, arranged in the appropriate ways and standing in the appropriate spatio-temporal relations, is quite sufficient for the nihilist to be able to explain the world of appearances. Denying that those simples stand in any relations of parthood does not, despite insistences to the contrary, create any serious tension with the dictates of common sense. This does not mean that nihilism is true, of course; independent and compelling arguments would be required to justify that belief. But what it does mean is that nihilism should not be dismissed solely on the basis of the common sense objection; it is not *obviously* false. It deserves to be taken more seriously than that.

§ 3. The Problem of Emergence

Having dispensed with the common sense objection to nihilism, I now turn to the central focus of this paper: the problem of emergence. In order to understand the problem, it is first necessary to understand exactly what is meant by the term 'emergent property'. To begin with a rough gloss, we can say that an emergent property is a property of an object or system that cannot be explained or accounted for solely in terms of the properties of that object's or system's constituent parts. It is in this sense that emergent properties are often said to be 'novel', in that

they are taken to be something entirely distinct from the properties of their bearer's basal constituents. To give a commonly used example, it is often suggested that the phenomenal properties of conscious experience are emergent. The actual phenomenal experience of elation, for example, is taken to be entirely distinct from and irreducible to, the electro-chemical properties of the brain which underpin it. These properties *emerge* at a certain level and cannot be reduced to properties instantiated by objects at a lower level. To borrow a quote from Paul Davies, by recognising emergence one "recognises that in physical systems, the whole is often more than the sum of its parts. That is to say, at each new level of complexity, new and often surprising qualities emerge that cannot, in any straightforward manner, be attributed to known properties of the constituents".[8]

With even this rough conception of emergent properties, the problem they pose for the nihilist soon becomes apparent. This is because, according to the nihilist there are no complex systems or objects at all, and thus there are no different levels of complexity. There are mereological simples and that's it. So if emergent properties are supposed to emerge only at higher levels of complexity (i.e. higher than the base level), then for the nihilist, there is nowhere for them to emerge. There is simply no place for emergent properties in a nihilistic ontology, because there are no candidate objects available to instantiate them.

There is a sizeable literature on the nature of emergent properties, and there is great debate over how they are best understood or best characterised. Some, for instance, think that emergent properties supervene on the intrinsic properties of their bearer's parts, whereas others claim that this supervenience fails.[9] Some think that emergence is best cashed out in terms of causation, such that emergent properties are those whose causal powers are quite distinct from the causal powers of their bearer's parts.[10] Others have claimed that emergence is best explained in terms of predictability, such that emergent properties are those that cannot be predicted to arise, even in principle, solely from a knowledge of the properties of the bearer's basic constituents.[11] And very recently it has been suggested that emergence can be explained in terms of the currently fashionable notions of *fundamentality* and *ontological dependence*, such that emergent entities are those which are fundamental, yet which are not ontologically independent.[12] However, despite the great differences between the many and varied accounts of emergence (and the few I have mentioned barely scratch the surface of the whole body of literature), there is a clear theme common to them all. That is, according to all these competing accounts, a *stratified* picture of the world is presupposed, whereby reality comes divided up into different levels of complexity. This is because, on all accounts of emergence, it is accepted that emergent properties

are taken to emerge *only* at higher levels of complexity than the base level, and that they are not reducible to, or explainable solely in terms of, properties instantiated at lower levels. But, of course, this can only be the case if there *are* multiple levels of complexity to begin with. And this is one of the very things that the nihilist denies! Central to the nihilist's view is an outright rejection of this stratification of reality. For the nihilist there is only one level, and everything that exists falls within it: there are mereological simples and nothing else. This is because the nihilist's stance is not merely *reductionist,* in that it aims to *reduce* all complex objects and their properties to simple objects and their properties, but it is robustly *eliminativist,* in that it aims to *eliminate* all complex objects and their properties altogether. All appearances of complex objects and higher-level systems are to be completely explained away. But this seems to entail that the nihilist cannot accept even the possibility of emergent properties. For if nihilism is true, there are no higher-level objects or complex systems available to instantiate them. Quite simply, there is nowhere for emergent properties to emerge.

If this is right, and nihilism is incompatible with the possibility of emergent properties, then it spells real trouble for the nihilist. This is because there are a number of good reasons to believe that emergent properties *are* possible. Indeed, there are good reasons to believe that they are actual. The most common forum within contemporary philosophy in which emergent properties are postulated is the philosophy of mind. For it is often thought that there are certain aspects of consciousness that are emergent, i.e. that cannot be reduced purely to properties of cerebral cells. The thought is that intentional properties or mental states (things like qualia) are so entirely distinct in character from the neurological, electro-chemical properties that are instantiated by the fundamental parts of the brain, that they cannot be explicable purely in terms of those properties. The intense throb of a pain, for instance, or a sharp pang of remorse, are simply not the kind of things that can be reduced to mere electro-chemical properties of neural cells, or so it is plausibly thought. They may well be *caused* by neural activity, but they emerge holistically as being far greater than the sum of their causal beginnings.

Another quite distinct field in which emergence is playing an increasingly prominent role is fundamental physics. Quantum mechanics, for instance, acknowledges the existence of certain composite quantum objects or systems (often referred to as 'entangled systems') which often exhibit properties that are quite inexplicable in terms of the object's/system's sub-atomic constituents alone. As explained by Tim Maudlin, "in quantum theory, then, the physical state of a complex whole cannot always be reduced to those of its parts, or to those of its parts together with their spatiotemporal relations. [...] The result of the most intensive scientific investigations

in history is a theory that contains an ineliminable holism."[13] This means that one of our most promising scientific theories recognises entities that are irreducibly holistic; that have properties which are not derivable purely from the intrinsic properties of the entity's parts and the spatiotemporal relations in which they stand. One clear way of explaining this phenomenon is to maintain that these holistic properties are *emergent,* in that they emerge at the system-level and constitute something quite over and above any mere summation of the properties of the system's constituents.

This all constitutes trouble for the nihilist. If some of our best theories of consciousness and fundamental physics imply the existence of emergent properties, yet nihilism rules out their very possibility, then so much the worse for nihilism. It would take a brave philosopher to reject the truth of quantum mechanics on the basis of his conviction in nihilism. But it should also be noted that emergence is quite a contentious phenomenon, and even in the afore-mentioned fields, the postulation of emergent properties remains controversial. It is by no means a widely accepted fact that there are aspects of conscious experience or holistic quantum properties which are genuinely emergent. However, the contentious nature of emergence does little to defuse the problem it poses for the nihilist. This is because, regardless of whether emergent properties are possible or not, it seems to go way beyond the jurisdiction of the nihilist to dictate the case one way or the other from his armchair. It may or may not be the case that the holistic properties of entangled systems are genuinely emergent properties, for instance, but whatever the case may be, it is surely best to leave the verdict in the hands of physicists; it is surely not for the nihilist to decide. Thus it should be seen as a significant cost – indeed, perhaps a prohibitive cost – of nihilism if it is to lay such heavy demands on various independent debates by ruling out the very possibility of emergent properties.

The problem I have just outlined has received very little attention in print. The only precise articulation of it that I know of is to be found in a 2007 paper by Jonathan Schaffer.[14, 15] Perhaps more pertinently, there is also a distinct lack of satisfactory solutions. Schaffer (2007) himself offers a solution, which is to endorse *monism*. Monism is a particularly radical form of nihilism according to which there is only a single concrete object in existence: the world itself. On this view, the world is taken to be a single, giant simple. I will not give this proposed solution any further consideration here simply because monism is such a controversial and unpopular view.[16] Indeed, much of the literature on nihilism fails to even recognise that monism *is* a version of nihilism at all. Rather, it is often simply assumed that nihilism postulates a vast number of simples which are microscopic in size. Moreover, it should be noted that Schaffer himself does

not endorse monism, branding it "a crazy view". Indeed, Schaffer's line of argument is to conclude that nihilism must be false because the only version of it that is compatible with emergence is monism, yet monism is clearly and obviously false. In what follows, I will present a solution to the problem of emergence that does not require the endorsement of monism.

§ 4. The Proposed Solution: Collective Instantiation

In order to respond to the problem of emergence, I think the nihilist should first consider the following question: why should the existence of emergent properties necessarily imply the existence of composite objects? In other words, just because new *properties* emerge at the macroscopic level, does this necessarily require that there must also be *objects* at that level in order to instantiate them? The solution I wish to propose answers 'no' to this question. Instead, I think the nihilist should insist that particles can *collectively instantiate* certain properties, even though those properties are not reducible to, or explainable in terms of, the properties each of the particles instantiates individually.

Central to the idea I am proposing is the claim that instantiation need not be a one-one relation.[17] That is to say, it needn't always hold between a single object and a single property. Rather, we should allow that instantiation can be a many-one relation, in that many objects can, *collectively,* instantiate a single property. One may say, for instance, that the *x*s collectively instantiate *F*. Now it is very important to note that in saying this I do not mean that the set (or any other collective term) of *x*s instantiates *F,* and neither do I mean that each of the *x*s instantiates *F* individually. Rather, plainly and simply, the *x*s collectively instantiate *F*. To illustrate what I mean, there is an analogy that can be drawn here with the thesis that *composition is identity* (CAI), which states that composite objects are identical to their parts taken together.[18] In order to make sense of CAI, one has to adopt a somewhat different understanding of the relation of identity than that which is classically recognised. Proponents of CAI take identity to be a many-one relation. So when one says that a composite object is identical to its parts, one is not saying that it is identical to the *sum* of its parts (for that is just a case of self-identity), nor is one saying that it is identical to *each* of its individual parts (for that would be absurd). Rather, one is saying that it is identical to its parts *collectively;* the many parts collectively stand in the relation of identity to the one whole. I wish to employ the same kind of idea here, but concerning instantiation rather than identity.

Once this notion of collective instantiation is recognised, it is fairly straightforward to show how it can be employed to overcome the problem of emergence. Let me give an example. Consider an ordinary composite object: my cat, Brian. The nihilist, remember, will not accept that Brian exists, because he does not believe there are any composite objects at all. However, he does accept that there are a certain number of microscopic simple particles that *do* exist, and that are arranged in a particular way (arranged cat-wise), and that engage in particular collective, feline activities. It is the existence of these particles, he says, that explains the *apparent* existence of the composite object, Brian. Moreover, he will say, all of Brian's alleged macroscopic properties (his mass, his shape, his colour, etc.) can be explained perfectly well by appealing only to those particles, the intrinsic properties they each instantiate, and the relations in which they stand. This is how the nihilist deals with the apparent abundance of macroscopic composite objects. But now suppose that Brian also instantiates some *emergent* property. Let's say it is some mental state, and let's call it *F*. In this case, appealing solely to the particles' individual properties and their inter-relations will not be enough to explain the existence of *F*. Precisely because *F* is emergent, it is not reducible to some mere conjunction of the intrinsic properties of its bearer's parts – that is, after all, in the very nature of an emergent property. In other words, an explanation of the individual particles and their individual properties will not be enough to explain the existence of *F*. However, if the nihilist is armed with a notion of collective instantiation, this does not represent a problem. For he can merely say that the particles arranged cat-wise *collectively instantiate F*. No one of the individual particles instantiates *F,* and neither is there any composite whole that instantiates *F;* indeed no single object instantiates *F* at all. Rather, the particles collectively instantiate *F*. Thus *F* emerges at a certain point, when some plurality of particles are arranged, and interact, in a certain way, but crucially, no single object – no *composite* object – is required in order to instantiate it. The emergence of *F* is therefore quite compatible with the absence of composite objects.

This strategy can be employed by the nihilist to explain the occurrence of any alleged emergent property. At the sub-atomic level, for instance, if some entangled quantum system is supposed to exhibit some holistic property, *F*, then the nihilist has no need to recognise the existence of the system itself in order to explain this phenomenon, but can merely maintain that the particles that allegedly compose the system collectively instantiate *F*. And the same is the case with any alleged instance of emergence, at the microscopic or macroscopic level. If particles are capable of collectively instantiating single properties, then there is no pressure to accept that those particles must be parts of a composite object, even if the properties they collectively instantiate are emergent.

One thing that is very important to note here is that the notion of collective instantiation I am proposing is very much *irreducible*. That is to say, if some particles collectively instantiate some property, *F*, in the sense I am proposing, then one will not be able to explain this in a reductive fashion by referring solely to the properties of the individual particles. Rather, it must be accepted as a brute and unanalyzable fact that this collective instantiation occurs. The fact that these particles instantiate *F* will resist any further illumination or explanation. This irreducibility is required in order to deal with the problem of emergence, precisely because emergent properties are themselves irreducible by nature. Of course, this will leave open the quite mysterious question of *why* emergent properties emerge when they do. But whilst this question is certainly somewhat mysterious, it does not present a problem unique to my proposed solution, but rather presents a problem with emergence in general. Even if one accepts the existence of composite objects, the question of why emergent properties emerge when they do remains.

§ 5. Making Sense of Collective Instantiation

What sense can one make of irreducibly collective instantiation? Just how plausible a suggestion is it that many objects can collectively instantiate a single property, even though none of the objects individually instantiate that property? I would suggest that it is a most plausible suggestion, and one that we can make perfect sense of. Firstly, I should say that it seems a lot more plausible than the central idea involved in composition as identity: that many objects can collectively be *identical* to a single object. Many philosophers think, and I include myself in this group, that CAI is logically incoherent. Many objects *simply cannot* be identical to a single object because the many objects have different properties to the single object. As David Lewis succinctly put it, "what's true of the many is not exactly what's true of the one. After all, they are many while it is one".[19] But as Leibniz told us, what have different properties must be distinct, therefore whatever relation the many stand in to the one, it cannot be identity.

Collective instantiation, by contrast, is not subject to any such obvious logical difficulties. There is no logical contradiction involved in supposing that many objects can collectively instantiate a single property. In fact, in ordinary language we talk as though such a thing happens all the time. Consider, for example, the following sentences:

S1: "The swans on the lake are white"

S2: "The swans on the lake surround the central island"

Both of these sentences involve collective predication, since they involve a predicate ("are white" and "surround the central island") being satisfied by a collection of things (the swans on the lake). But there are some important differences between the two. In S1, whilst the predication is collective, it is also reducibly so. That is to say, the predicate is collectively satisfied in virtue of it being individually satisfied by each of the swans. All of the swans are white because each of the swans is white. Thus in order to understand S1 we do not need to recognise that any sort of collective instantiation is going on – it is simply a case of many things individually instantiating the same property.

S2, however, is different. The predication involved here is *irreducibly* collective. It is not the case that the predicate is satisfied collectively in virtue of it being satisfied by each of the individual swans. No individual swan surrounds the central island, they do so only collectively. Moreover, in understanding S2, at no point are we tempted to think (or so I shall presume) that there is some single thing (some kind of swan-fusion) that satisfies the predicate. Rather, we simply understand that they do so collectively – the many swans collectively surround the central island. What this suggests is that we already have some kind of intuitive grasp on what irreducibly collective instantiation involves. In ordinary thought and talk we already seem to recognise that many things can collectively, but irreducibly, have certain properties.

I should make it clear that I am not suggesting that collective predication and collective instantiation are one and the same thing; they are not. One is a linguistic phenomenon, while the other is a worldly, or metaphysical, phenomenon. But there are clearly similarities between the two. And if we can make perfect sense of the former, which we clearly can, that might be good reason to think we make equally good sense of the latter. What I am meaning to impress, then, is that the notion of irreducibly collective instantiation that I am proposing is not some metaphysical oddity, but something quite intuitive and plausible. It is not something that should raise any particular suspicions.

Finally, I need to say at least a little bit more about instantiation in general. So far, I have been talking of instantiation as being a *relation* that holds between particulars and properties. But this is quite a controversial view, for it is well-known that there are many problems associated with it, perhaps most notably, the threat of Bradley's regress. However, as I mentioned earlier, my proposed solution does not depend on this relational understanding of instantiation. In fact, the solution is intended to be fairly neutral in that respect, and thus compatible with all manner of views on how properties are instantiated. Some, for instance, like Armstrong and Strawson, have claimed that instantiation is not a relation at all, but rather, some kind of fundamental (and

non-relational) nexus or tie.[20] But as far as this view is acceptable at all, there seems no reason why it cannot be extended to include collective instantiation. That is, if it is theoretically acceptable to have a non-relational nexus linking a single object to a single property, then there seems no obvious reason to say why such a nexus could not link *many* objects to a single property (even though none of those objects were linked *individually* to that property). Alternatively, one might be suspicious of instantiation altogether, and reject the claim that there is any *thing* which links particulars to their properties at all. On this view, particulars would simply *have* certain properties, and that is all there is to it. But once again, there doesn't appear to be any obvious reason for this view to exclude the proposed solution. That is, if one accepts that a single object can just *have* a property, without there being any intermediary required to link the two, then it is only a short leap to accept that *many* objects can just have a single property in the same way. (Of course, it must be remembered that we are not saying that many objects *individually* have the property in question – they don't – but that they collectively have it). In short, what I am suggesting is that regardless of one's favoured view of how properties are instantiated, there should in principle be some acceptable modification of that view possible whereby it can be employed *collectively*.

§ 6. Concluding Remarks

I have argued that, contrary to what some have thought, mereological nihilism is quite compatible with emergence. If one accepts that particles can collectively instantiate properties, then there is no pressure to acknowledge composite objects in order to explain emergent properties, and thus the problem of emergence entirely disappears. Irreducibly collective instantiation allows that properties can emerge at the macroscopic level, even if there are no objects at that level to instantiate them. Moreover, I hope to have shown that collective instantiation is a plausible and even intuitive notion; one that we can easily make sense of, and in fact, one that we already seem to have an implicit grasp of, if ordinary language is anything to go by. Finally, I have argued that this solution is neutral with regard to the independent question of how properties are instantiated. Whatever one's view is of how objects instantiate properties, there should be a plausible and unproblematic modification of that view whereby they can be instantiated collectively. Overall, then, irreducibly collective instantiation serves to make nihilism a more plausible view. Whatever problems the nihilist may face, emergence is not one of them.

§ 7. Notes

[1] Defenders of nihilism include Cameron (2010) and Sider (2013).

[2] Of course, nihilism only rules out the existence of such things if they are taken to be composite. The nihilist is perfectly entitled to accept the existence of cars, houses and humans (as well as any other type of object), providing he also insists that they are mereologically simple. But asserting that cars, for instance, are mereologically simple would probably not serve to make the view any more amenable to common sense.

[3] Rea (1998, p.348)

[4] Markosian (1998a, p.221)

[5] The locution "arranged *x*-wise" was introduced by van Inwagen (1990, p.109)

[6] I am supposing, for sake of simplicity, that each person counts as a single entity.

[7] Sider (2013, p.238)

[8] Davies (2006, x)

[9] Crane (2001), for example, argues that emergent properties do supervene on the properties of their bearer's parts. Schaffer (2007), McDaniel (2008), and O'Connor (2000), however, all claim the opposite.

[10] E.g. Crane (2001).

[11] This is the more traditional view of emergence, endorsed by, among others, D.C. Broad (1923).

[12] Barnes (2012)

[13] Maudlin (1998, p.56)

[14] Schaffer (2007, pp.184-187). Arguably, however, the rough core of the problem can be found in van Inwagen (1990). Van Inwagen sets out a radically eliminativist ontology in which he rejects the existence of the vast majority of ordinary composite objects. He stops short of eliminating living organisms, however, and one of his main reasons for doing so is that he claims that consciousness cannot be reduced to the properties of the fundamental parts of the brain, nor can it be explained as a mere collective activity of those parts. Van Inwagen does not state that he takes consciousness to be an *emergent* phenomenon; indeed emergence is not mentioned at all. But he does seem to take consciousness to be in some sense holistic, or irreducible, and as such, incompatible with a thoroughgoing mereological nihilism.

[15] Sider (2013, p.244n) also recognises the problem, albeit very briefly. His response, which is given equally briefly, is to deny that there are any genuinely emergent properties.

[16] It has a rich philosophical history, of course, tracing right back to Parmenides, but is much less popular today. For a current endorsement of monism, see Horgan & Potrc (2000; 2008).

[17] In what follows, I will be talking of instantiation as a *relation;* one that holds between particulars and properties. I am aware that to many this will seem objectionable, as there are many problems associated with taking instantiation to be a relation. However, this way of talking is just for purposes of expediency and clarity. The idea that I am proposing – that properties can be instantiated collectively – does not depend on this relational understanding of instantiation. Rather, I think that the solution I am proposing is neutral with regard to how properties are instantiated. I will say more on this later.

[18] For a defence of CAI see Baxter (1988)

[19] Lewis (1991, p.87)

[20] See Armstrong (1989) and Strawson (1959)

§ 8. References

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