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FROM NIHILISM TO MONISM

Jonathan Schaffer

Mereological nihilism is the view that all concrete objects are simple. Existence monism is the view that the only concrete object is one big simple: the world. I will argue that nihilism culminates in monism. The nihilist demands the simplest sufficient ontology, and the monist delivers it.

Nothing is cheaper and commoner in philosophy than monism; what, unhappily, is still rare, is an attempt to defend it, and critically to establish its assumptions.

[Schiller 1897: 62]

Mereological nihilism is the view that all concrete objects are simple. Extant discussions of nihilism assume that such simples will be *many and small*—some plurality of point particles or other wee bits of matter. *Existence monism* is the view that the only concrete object is the world. Such monism is a version of nihilism since it entails that the only concrete object is *one big simple*—a partless, seamless One. I will argue that *nihilism culminates in monism*. The nihilist demands the simplest sufficient ontology, and the monist delivers it.

What will emerge is a story about how commonsense is *divided*. On the one hand, commonsense ontology embraces mereological composites. On the other hand, commonsense methodology demands the simplest sufficient ontology. This is the story about what commonsense is divided *between*—on the one hand folk mereology, and on the other, not the Democritean idea of atoms in the void, but rather the Parmenidean vision of a seamless One.

The parts: in Sections I – III I will introduce nihilism and its monistic variant, leading to a taxonomy of nihilisms. In Sections IV – VII I will provide reasons why the nihilist should go monistic. Finally in Section VIII I will speak of how common sense is fragmented, and offer some parting advice for the anti-nihilist.

I. Mereological Nihilism

Mereological nihilism is the view that all concrete objects are simple. None are mereologically composite. None have proper parts.[1] (Here I am limiting

[1]Such nihilism is introduced in van Inwagen [1990], and defended in Dorr [2001] and Rosen and Dorr [2002]. Quasi-nihilistic doctrines are defended in van Inwagen [1990] and Merricks [2001]—van Inwagen allows composites only when they constitute *a life*, Merricks allows composites only when they have non-redundant causal powers, which he thinks happens when there is *a mind*. For further discussion of nihilism, see Markosian [forthcoming: §4].

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the scope of nihilism to actual concrete objects. Such nihilism is neutral on whether there are any other sorts of entities, and if so, on whether these entities might have proper parts.)

Nihilism is a radical view. It entails that there are no tables and chairs, no persons and families, no planets and galaxies.[2] *First exercise*: list some actual concrete objects. Here one might list tables and chairs, pebbles and apples, and other moderate-sized specimens of dry goods. As we say, these are all as real as rocks. *Second exercise*: look around and list some objects that you see. For instance I might now list a computer, desk, lamp, and coffee cup. Nihilism entails that nothing on these lists is real. The nihilist accepts that these are all as real as rocks, but not in the intended sense of the phrase.

According to extant versions of nihilism, the only actual concrete objects are the particles. These particles are physical minima. They are something like point particles (e.g., electrons) or other wee bits of matter. For reasons that will emerge more fully in Section III, I call this *minimal nihilism*.

When we folk talk about tables and other purported composite objects, the nihilist invokes paraphrases and fictions. The minimal nihilist invokes paraphrases and fictions that involve her particles. Thus when we say that there is a table, the minimal nihilist holds that what exists are particles arranged table-wise. Here talk of the table is paraphrased via a plural term ('particles') and a non-distributive predicate ('arranged table-wise').[3] The minimal nihilist also holds that what we say is true according to the fiction of composition, which is the 'fiction' that the particles compose larger concrete objects.[4] The paraphrase and the fiction prove complementary, in that the paraphrase identifies the utility-maker for the fiction. That is, the fiction of composition earns its keep by summarizing the (often hideously complex) arrangement of particles. For the minimal nihilist, table talk is useful shorthand.

Supposing that these paraphrases and fictions work well enough, one might still wonder: why resort to *that*? Why not just take folk discourse at face value, and countenance tables and other composite *concreta*, as intuitively obvious and perceptually apparent? What could motivate a view as radical as minimal nihilism?

The main argument for minimal nihilism is *the explanatory exclusion argument*.[5] The argument begins by noting that to have an explanatorily sufficient ontology, particles are the only concrete objects needed:

1. Particles are the only concrete objects needed to explain how the world evolves.

[2]Here I am assuming that any such entities, if they were to exist, would be actual concrete composite objects. Though see Chisholm [1976] for a defence of the view that persons are simples.

[3]See van Inwagen [1990] for the 'particles arranged table-wise' paraphrase, and Merricks [2001] as well as Uzquiano [2004] for further discussion.

[4]See Rosen and Dorr [2002] for the 'according to the fiction of composition' amendment, and McGrath [forthcoming] for further discussion.

[5]The style of argument traces back to Kim [1993], who uses it to argue against non-reductive physicalism, on grounds that mental properties must reduce or face causal/explanatory impotence. Versions of the argument targeting composite objects are explicit in Merricks [2001: 56] and Dorr [2001: §2.1]. Strictly speaking when I speak of 'nihilism' I shall mean 'nihilism as motivated by such an argument'—were some other argument for nihilism to emerge, it would be an open question whether it too would culminate in monism (thanks to Ned Markosian on this point).

Somewhat more precisely, 1 claims that the complete causal story of the world can be told in terms of the number, properties, and arrangement of mereologically simple particles, together with whatever laws of nature govern them. No composite *concreta* like tables need be mentioned in this story. To take a toy example, consider a closed Newtonian atomistic system containing what we folk would describe as a rock shattering a window. The complete causal story here can be told purely in terms of the evolution of the Newtonian atoms through time (via their properties and relations, as governed by Newtonian laws). The rock and the window need not be mentioned. The particles can handle 'all the causal work'.[6]

The argument then adds that recognizing composite concrete objects like tables in addition to the particles is recognizing what is either explanatorily redundant or epiphenomenal:

2. If particles are the only concrete objects needed to explain how the world evolves, then if there were composite sums of particles, these composites would be explanatorily redundant or epiphenomenal entities.

If the particles are the only concrete objects needed to explain things (as per 1), then there is nothing left for the composites to explain. The composites can at best explain what the particles already suffice for. So if the composites such as tables explain anything at all they are redundant, while if they explain nothing at all they are epiphenomenal.[7]

The argument continues with a rejection of both explanatorily redundant and epiphenomenal entities:

3. There are no explanatorily redundant or epiphenomenal entities.

Such a rejection is best defended on methodological grounds. Occam's Razor cuts against both explanatorily redundant and epiphenomenal entities, as there is no need to posit either.[8]

[6]Note that Kim's version of the exclusion argument only holds that *the physical* suffices to explain everything. The nihilist's argument involves the further commitment that the physical explanation will be an explanation in terms of particles. Van Inwagen flags this assumption explicitly: 'I assume that matter is ultimately particulate. I assume that every material thing is composed of things that have no proper parts: "elementary particles" or "mereological atoms" or "metaphysical simples"' [1990: 5]. This further assumption is empirically questionable: §V.

[7]One might resist 2 by maintaining that *composition is identity*, so that the composite *is* the particles (e.g., the table *is* the particles arranged table-wise). If so then the composite is not something in addition to the particles. See [Baxter 1988; Lewis 1991; Armstrong 1997; Sider 2007] for further discussion. Lewis, Armstrong, and Sider all conclude that composition is *not* identity (after all, the parts are *many* while the whole is *one*), but is merely identity-like in some respects. This 'analogy' thesis will not support resistance to 2—so long as the table is not literally identical to the particles arranged table-wise, there will be room to accept the particles but still reject the table, as an entity posited without necessity.

[8]3 might also be defended on ontological and/or epistemic grounds. The ontological defence of 3 would invoke the Eleatic Stranger's dictum from Plato's *Sophist*, that to be is to have causal power. But this seems implausible: epiphenomenal entities are surely conceivable, which is good evidence that they are possible. The epistemic defence of 3 would maintain that we have no good reason for believing in explanatorily redundant and epiphenomenal entities. But this seems parasitic on Occamite principles. For further discussion see the exchange between Sider [2003] and Merricks [2003]. I will return to the status of 3 briefly at the end of §VIII.

From this the argument concludes:

4. There are no composite sums of particles.[9]

The conclusion may seem highly implausible, but the argument is valid, and each premise seems plausible individually. In any case, I am now pursuing the question of where the argument leads. Suppose the argument is sound—does nihilism *require* an ontology of particles? What sort of ontology do explanatory exclusion arguments yield?

II. Existence Monism

Existence monism is the view that there exists one and only one actual concrete object. There is only *the world*.[10]

Such monism is a species of nihilism. Where the nihilist holds that all actual concrete objects are simple, such a monist agrees, adding that there is only one such simple, the One. Thus monism entails nihilism, but not vice versa. The entailment from monism to nihilism is direct. If there is one and only one concrete object, it cannot have any proper parts, or else such parts would comprise a second concretum. So the One must be simple.[11] The failure of entailment from nihilism to monism can be seen in a model in which all that exists are two particles. The two-particles-only model satisfies nihilism but not monism.

[9]The minimal nihilist might want to draw a stronger conclusion, namely:

4′. Necessarily, there are no composite sums of particles.

The natural way to get to 4′ would be to prefix a necessity operator to premises 1–3. But the resulting premises lose plausibility as a result. Thus consider:

1′. Necessarily, particles are the only concrete objects needed to explain how the world evolves.

That seems false (where 'the world' is read *de dicto*), since presumably there are some worlds in which there are no particles at all, or at which the particles are not explanatorily sufficient. And consider:

3′ Necessarily, there are no explanatorily redundant or epiphenomenal entities.

That seems false as well, since epiphenomenal and redundant entities are surely at least conceivable, even if we may have no reason to believe they actually exist. Thus in the main text I will treat nihilism as merely making a contingent claim about the actual world.

[10]Existence monism is one of many species of monism. In general a monistic doctrine identifies a certain target t and unit of counting u, and then holds that t as counted by u is one. Existence monism is the species of monism for t = actual concrete objects and u = tokens. See Schaffer [2007: §1] for further discussion of the genus *monism*.

Existence monism should be distinguished from *priority monism*. Priority monism is monism for t = actual concrete objects and u = basic tokens. Priority monism thus holds that one concrete object (the whole, the world) is *basic*. There are other concrete objects (the parts), but these exist derivatively, as fragments of the whole. Priority monism is thus the traditional doctrine that *whole is prior to part* (a doctrine which presupposes the existence of the parts for the whole to stand in the priority relation to). See Schaffer [forthcoming] for a defence of priority monism, and some evidence that most traditional 'monists' are best read as priority monists. As Joad notes: 'The wholes emphasized by monistic philosophers are, therefore, logically prior to their parts. They are there, as it were, to begin with, and being there, proceed to express themselves in parts whose natures they pervade and determine' [1957: 420].

I will return to priority monism briefly at the concluding portion of §VIII, where I suggest it as a way of being anti-nihilistic. In the interim I shall use 'monism' to refer specifically to existence monism.

[11]As Ted Sider pointed out to me, monism is actually compatible with both nihilism and classical mereology. Indeed, the one atom model is the only model compatible with all answers to the *special composition question* [van Inwagen 1990]. The special composition question asks when many entities compose a single one, and given monism the question never arises, or at least it never arises within the domain of concrete objects.

Monism is an extremely radical view. Monism, as a form of nihilism, entails that there are no tables and chairs, no persons and families, no rocks, planets, and galaxies. Monism adds that there are nothing like particles either. The world is a seamless simple. All apparent diversity is an illusion. As father Parmenides has written: 'Nor is it divisible, since it is all alike; nor is there any more or less of it in one place which might prevent it from holding together, but all is full of what it is' [*Frag*. 8a].

When we folk talk about tables and their ilk, the monist invokes her own *paraphrases* and *fictions*, different from those of the minimal nihilist (Section I). When we say that there is a table, the monist holds that what exists is *the world aspected table-ishly*. Here talk of tables is paraphrased in terms of the world and its modes.[12] The monist also holds that what we say is true *according to the fiction of decomposition*, which is the 'fiction' that the world decomposes into proper parts.[13] As with nihilism, the paraphrase and the fiction prove complementary. The fiction of decomposition earns its keep by nominalizing the aspects of the world. Table talk is less clumsy than talk about the table-ish aspects of the One.

Monism, extremely radical though it may be, can be motivated by a version of the explanatory exclusion argument. The monistic version of the argument runs:

5. The world is the only concrete object needed to explain how the world evolves.

Somewhat more precisely, 5 claims that the complete causal story of the world can be told in terms of the physical aspect of the world (a path in physical configuration space), together with whatever laws of nature govern temporal evolution.[14] No pieces of the world like tables need be mentioned in this story. To take a toy example, consider a Newtonian world containing what the folk would describe as a rock shattering a window. The complete causal story here can be told purely in terms of the world's occupational manner vis-à-vis Newtonian configuration space.[15] The rock and the window need not be mentioned. The world bears all the causal information.

[12]That is, the monist can paraphrase talk of tables in terms of *complex adverbial qualifications of the world*. So the world might be table-ish here-ishly, and chair-ish there-ishly. There is just the world and its many modes. This strategy may trace back to Spinoza, at least on Bennett's interpretation: 'Spinoza says that finite particulars are "modes" . . . Spinoza really is saying that ordinary particular things are ways that reality is' [1984: 92]. More formally, the strategy is to treat the instantiation relation as region-indexed, so we get constructions like: the world instantiates-at-*r1* tablehood, and the world instantiates-at-*r2* chairhood. (Note that this involves commitment to various regions and properties. Though recall that the form of monism under discussion is only a monism about concrete objects.) See [Johnston 1987; Hawthorne and Cortens 1995; and Burgess and Rosen 1997] for further explanation of adverbial paraphrases.

[13]The idea of the fiction of decomposition is lifted from the nihilist's idea of the fiction of composition (§I). It is a fiction governed by the supposition that the world has proper parts. I leave it to the monist to decide such questions of detail as whether the appropriate fiction allows for arbitrary undetached parts, or is more restrictive in which parts it countenances.

[14]So clarified, thesis 5 involves commitment to physical properties and laws. Though recall that the form of monism under discussion only concerns concrete objects.

[15]In this vein, Albert [1996] argues that the most natural ontology of both Newtonian and quantum mechanics is in terms of a single world-atom zipping through configuration space.

The argument then adds that recognizing proper parts of the world like tables is recognizing what is either explanatorily redundant or epiphenomenal:

6. If the world is the only concrete object needed to explain how the world evolves, then if there were proper parts of the world, these proper parts would be explanatorily redundant or epiphenomenal entities.

If the world suffices to explain everything (given 5), then there is nothing left for its proper parts to explain. Its proper parts can at best explain what the world already suffices for. So if the proper parts explain anything at all they are redundant, while if they explain nothing at all they are epiphenomenal.

The argument continues with a rejection of both explanatorily redundant and epiphenomenal entities:

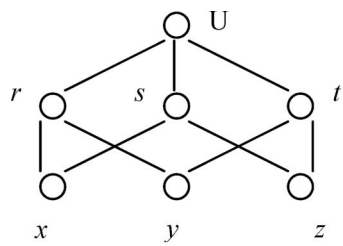
7. There are no explanatorily redundant or epiphenomenal entities.

7 is exactly the same as 3 and claims the same Occamite support. The argument then concludes:

8. The world has no proper parts.

III. Nihilistic Ontologies

What emerges is that there are many nihilistic ontologies. So consider the three-atom model in classical mereology:[16]



Classical mereological structure	
Universe:	U= *x*+*y*+*z*
Molecules:	*r* = *x*+*y*
	s = *x*+*z*
	t = *y*+*z*
Atoms:	*x*, *y*, *z*

Here classical mereology recognizes seven entities ($2^n - 1$ entities, for $n = 3$ atoms). One form of nihilism—and clearly the intended form of nihilism in the extant literature—maintains that only *x*, *y*, and *z* exist. But a second form of nihilism—the monistic version—maintains that only U exists. And intermediate forms of nihilism are possible, including an ontology on which only *r*, *s*, and *t* exist, one on which only *r* and *z* exist, one on which only *s* and *y* exist, and one on which only *t* and *x* exist. These are

[16]By 'classical mereology' I mean the logic of part-whole relations developed in [Leonard and Goodman 1940]. See [Simons 1987] for further discussion.

all nihilistic ontologies—no proper part relations are countenanced, everything is simple.[17]

To distinguish the many forms of nihilism, I will speak of minimal, medial, and maximal nihilisms. Intuitively, the distinction can be understood in terms of *the scale of the simples*. Minimal nihilism posits minimally small (presumably point-sized) simples, maximal nihilism posits a maximally large (world-sized) simple, while medial nihilism posits simples of intermediate scale. More precisely, the distinction can be drawn by asking the nihilist to 'indulge in the fiction' of classical mereology with decomposition[18] (on a domain of actual concrete objects). The minimal nihilist posits entities that are mereological minima on the classical model. The maximal nihilist posits the entity that is the mereological maximum on the classical model.[19] And the medial nihilist posits entities that are mereological intermediary – they appear in the middle of the classical diagrams.

Maximal nihilism is monism by another name, and in what follows I will use 'maximal nihilism' and 'monism' interchangeably. The underlying doctrine is that the only actual concrete object is the universe: U. This underlying doctrine satisfies the monistic formula that exactly one concrete object exists, and it satisfies maximal nihilism by positing a maximally large simple, which is the unique mereological maximum on the classical model.

Thus explanatory exclusion arguments are compatible with many incompatible ontologies. Why posit point particles, or middling simples, when one could have the world?

IV. Commonsense Lost

I will now argue that the mereological nihilist should embrace existence monism. To begin with, the nihilist has nothing to lose. What is objectionable about monism—that it is *crazy*—was already objectionable about nihilism, and what responses are available for the nihilist—paraphrases and fictions—are equally available for the monist.

[17]Perhaps the many versions of nihilism may have been obscured by the many senses of 'atom'. A mereological atom is an entity without proper parts. A physical atom is something very small. So perhaps it has been presumed that the mereological atoms are very small, *though nothing in nihilism requires this*.

[18]Classical mereology does not itself have any decomposition rules. So strictly speaking the intended fiction is some supplemented variant of classical mereology, such as classical mereology plus the *doctrine of arbitrary undetached parts*. Here is how van Inwagen [2001: 75] states this supplemental principle:

> For every material object M, if R is the region of space occupied by M at time t, and if sub-R is any occupiable sub-region of R whatever, there exists a material object that occupies the region sub-R at t.

This is the sort of principle that the monist may regard as the fiction. After all, as noted above (n. 11), monism is compatible with unsupplemented classical mereology.

[19]It is a theorem of classical mereology that there exists a unique mereological maximum (for which 'U' [the universe] is typically reserved). The existence of U is established by unrestricted composition (U is the fusion of everything), and the uniqueness of U is established by the uniqueness of composition. U is then used to define the complementation operation: Comp:$x = \mathrm{U} - x$.

In the main text I am assuming that the mereological domain is the domain of actual concrete objects, so that U = the maximal concrete hunk. But if one countenances wider mereological domains containing further entities, one will still be able to prove that there exists a unique maximal concrete object (for which 'O' might be reserved), as the unique fusion of all concrete objects. The maximal nihilist should then be understood as positing that the one and only concrete object is O. The reader who prefers to do her mereology with a wider domain may substitute 'O' for 'U' throughout the main text.

So the stock objection to monism is that it contravenes commonsense. Thus Russell famously wrote: 'I share the common-sense belief that there are many separate things; I do not regard the apparent multiplicity of the world as consisting merely in phases and unreal divisions of a single indivisible Reality' [1959: 36; see also Moore 1993]. Since Russell, the existence of many concrete objects has been held to be intuitively obvious and perceptually apparent. As a result, monism has virtually disappeared from the contemporary scene.[20]

This same objection has equal force against pluralistic (minimal and medial) nihilisms. Starting with minimal nihilism, those who say it is intuitively obvious and perceptually apparent that there are many objects, will typically invoke mereological composites like chairs and tables as their paradigm cases. To the extent that monism should be rejected on these grounds, minimal nihilism should have been rejected from the start. Medial nihilism does slightly better here, but not by much. For if the medial nihilist accepts the existence of persons, she must deny the existence of limbs (on pain of recognizing proper parts). But then the objection will be voiced that the existence of limbs is intuitively obvious and perceptually apparent.[21]

Pluralistic nihilists have responded by invoking fictions and paraphrases (§I). The monistic nihilist can follow suit (§II). Instead of speaking of the fiction of composition, the monist will speak of the fiction of decomposition. Instead of speaking of the arrangement of particles, the monist will speak of the modes of the world. Pending further objections, the monistic and pluralistic styles of reply seem at this point equally viable.[22]

What emerges is that the nihilistic strategies of paraphrase and fiction prove to undo all the defences to monism that the early analytics erected.[23] The road to Hegel is paved with paraphrases. If common sense can be

[20] *Exercise for the reader (hard)*: find any contemporary metaphysics text with more than a passing mention of monism. *Second exercise (very hard)*: find any contemporary metaphysics text with a sympathetic word for monism. To give a representative example of the contemporary attitude, Hoffman and Rosenkrantz, in the course of a book-length discussion of the notion of substance [1997: 78], dismiss monism with but two sentences:

> Monism has an additional very serious disadvantage: it is inconsistent with something that appears to be an evident datum of experience, namely, that there is a plurality of things. We shall assume that a plurality of material things exists, and hence that monism is false.

(*Hints* for the second exercise: look to [Horgan & Potrč 2000; Rea 2001].)

[21] The reader who doubts whether commonsense takes a stand on parts of the body is invited to recall Moore's 'proof' of an external world, which begins: 'Here is one hand . . . and here is another' [1993: 166].

[22] The viability of the paraphrases raises a deep issue, concerning *the role of objects* in ontology. Perhaps objects play certain roles that one or the other of the paraphrases would compromise. For instance, perhaps non-maximal objects feature in an account of *intrinsicness* or *modal recombination* in a way that modes cannot. Or perhaps non-maximal objects may enjoy *purely haecceitistic differences* while modes may not. These examples (both of which I owe to Ted Sider) both challenge the monistic paraphrases of object talk into mode talk. I cannot address these concerns here, save to note that I take the primary role of objects to be serving as pincushions for properties. Since all the modes one needs may be pinned onto the world, the monistic paraphrase at least seems viable in this primary respect.

[23] On the standard view of monism inherited from Russell, there is nothing a priori wrong with monism. It just turns out, a posteriori, that we see many things. Thus Russell [1959: 45] clarifies his view as follows:

> There is nothing in logic that can help us to decide between monism and pluralism, . . . My own decision in favor of pluralism and relations is taken on empirical grounds, after convincing myself that the a priori arguments to the contrary are invalid.

The point in the main text is that once the nihilist allows us to paraphrase away claims about what we can see, the monist is free to paraphrase away Russell's 'empirical grounds' for pluralism.

paraphrased away for a simpler sufficient ontology, then there is no remaining barrier to going all the way to monism.

V. Infinite Descent

The mereological nihilist gains in three main ways by embracing existence monism, the first of which is that only the monistic version of the exclusion argument is compatible with *infinite descent*. That is, premise 1 (the particles suffice to explain everything) indulges in the questionable scientific assumption that physics will bottom out in particles. There might actually be an infinite descent of levels of nature, with physics identifying endless layers of structure. This argument may be phrased as follows:

9. Infinite descent is an empirically open scenario.

10. Infinite descent is not consistent with 1.

11. Infinite descent is consistent with 5.

From 9 – 11, it follows that 5 is preferable in respect to covering the scenario of infinite descent.

In defence of 9, there are serious scientific hypotheses that involve infinite descent. For instance, considerations of renormalization in quantum field theory have led Georgi to suggest that effective quantum field theories might form an infinite tower which 'goes down to arbitrary short distances in a kind of infinite regression . . . just a series of layers without end' [1989: 456]. Dehmelt [1989] postulates an infinite regression of sub-electron structure. Greene, addressing the question of what strings are made of, allows two possible answers: 'First, strings are truly fundamental—they are ''atoms'', *uncuttable constituents*, in the truest sense of the ancient Greeks'. To which he then adds:

> [H]istory surely has taught us that every time our understanding of the universe deepens, we find yet smaller microconstituents constituting a finer level of matter. And so another possibility, . . . is that [strings] are one more layer in the cosmic onion.
>
> [1999: 141 – 2]

In this light, Gell-Mann replies to the question of whether science is finite or infinite with: 'That's a very difficult question. I can't say' [Horgan 1996: 215]. The metaphysician has no business dictating the number of levels of nature, from her armchair.[24]

[24]Since I am only treating nihilism as a contingent claim about the actual world (§I), I must allow that *if* a fundamental level of nature were discovered, then infinite descent would no longer trouble the minimal nihilist. The argument in the main text works with the notion of an 'empirically open scenario', with the idea being that we should now give *some positive credence* to the claim that there actually is an infinite descent [Schaffer 2003]. Given that infinite descent is incompatible with minimal nihilism but compatible with maximal nihilism, it follows that we should then (*ceteris paribus*) give *greater overall credence* to maximal nihilism than to minimal nihilism.

In defence of 10, if there actually is an infinite descent, then there are no simple particles that could suffice to explain everything. Indeed, there will be no minima for the minimal nihilist to recognize. Her ontology would drain away down a bottomless pit.[25]

In defence of 11, if there actually is an infinite descent, then the world still exists. The maximal nihilist's ontology is intact. For her, infinite descent represents just one aspect that the world might have. The One might be limitlessly-divisible-ish everywhere-ish. More precisely, the monistic paraphrase would run: ($\forall r$) U is-at-r divisible.[26]

To put the argument from infinite descent in another light, we might invite the nihilist again to 'indulge in the fiction' of classical mereology with decomposition. That theory has *gunky* models in which everything has proper parts. The classical mereologist can represent an infinite descent by such models. Recall (§III) that the minimal nihilist posits entities that are mereological minima on the classical model, while the maximal nihilist posits the entity that is the mereological maximum on the classical model. In gunky models (as in all models) the unique maximum entity U still exists. But with gunk there are no minima. What emerges is that infinite descent is an empirically open scenario for the actual world, that can be represented by both classical mereology and its maximal nihilist image, but that cannot be represented by any minimal nihilist image.

VI. Emergent Properties

The second respect in which the mereological nihilist gains by embracing existence monism is that only the monistic version of the exclusion argument is compatible with *emergent properties*. That is, 1 assumes that the properties of composite systems are derivative from the component properties of their parts, together with their spatiotemporal arrangements. Instead composite systems might feature holistic properties. Indeed, one of the distinguishing features of quantum mechanics (which engenders the non-locality results) is the presence of *entangled systems*, whose wave-functions are *not* derivable as tensor products of the wave-functions of their component systems. Entangled systems thus feature emergent, holistic properties [Teller 1986; Maudlin 1998: 56; Healey 1999; Arntzenius forthcoming]. The argument may be phrased as follows:

12. Quantum entanglement produces emergent properties.

13. Emergent properties are not consistent with 1.

14. Emergent properties are consistent with 5.

[25]See [Block 2003; Kim 2003; Schaffer 2003] for related discussion of whether the possibility of infinite descent is compatible with Kim's version of the exclusion argument.

[26]The medial nihilist might usurp the monistic paraphrase. That is, the medial nihilist still has intermediary levels of mereological structure to posit, and may now speak of her middling simples as being-at-r divisible (thanks to Trenton Merricks and Kelly Trogdon for this point). Though once the nihilist accepts the sort of paraphrases needed for monism, one wonders why she would resist going all the way.

From 12–14, it follows that 5 is preferable in respect to avoiding the empirically false assumption that physics will spurn emergence.

In defence of 12, entangled quantum systems contain new information (in the correlation coefficients), not derivable from the intrinsic states and spatiotemporal relations of their components. Thus Esfeld notes: 'In the case of entanglement, it is only the description of the whole . . . which completely determines the local properties of the parts and their relations . . . Therefore, quantum physics exhibits a substantial holism' [1999: 26]. And Maudlin writes:

> 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.
>
> [1998: 56]

In other words, *mereological supervenience fails*. The intrinsic properties of entangled wholes do not supervene on the intrinsic properties and arrangements of their parts. What that means is that, assuming that a given chair forms an entangled system, the chair is something over and above the particles arranged chairwise, in a very precise sense. The whole-chair-system contains new information that cannot be derived from the information about the particles arranged chairwise.

In defence of 13, the minimal nihilist's ontology of particles and their arrangements is not rich enough to account for quantum entanglement. Thus consider the following two entangled states for a two-particle system, in the basis of eigenvectors of z-spin:

S1: $1/\sqrt{2}\ [\text{z-up}\rangle_1[\text{z-down}\rangle_2 - 1/\sqrt{2}\ [\text{z-up}\rangle_1[\text{z-down}\rangle_2$

S2: $1/\sqrt{2}\ [\text{z-up}\rangle_1[\text{z-up}\rangle_2 - 1/\sqrt{2}\ [\text{z-down}\rangle_1[\text{z-down}\rangle_2$

These are empirically different states, which differ in their correlations.[27] But there is no difference in the intrinsic states of the particles or their spatiotemporal arrangements. There is only a difference in the whole. The minimal nihilist cannot recognize this difference.[28]

[27]S1 entails that the two particles are anti-correlated in z-spin: either the first is up and the second down, or the first is down and the second up. (In conjunction with Born's rule, it also entails that there is a .5 chance of finding either result.) S2 entails that the two particles are correlated in z-spin: either both are up, or both are down. (In conjunction with Born's rule, it also entails that there is a .5 chance of finding either result.)

[28]To account for this difference, the minimal nihilist might try to introduce new fundamental relations (*entanglement relations*) alongside her spatiotemporal relations. She would then presumably replace talk of 'particles arranged tablewise' with talk of 'particles arranged tablewise and entangled thuswise' where 'thuswise' functions as a placeholder for the correlation coefficient of the associated quantum state. There are some problems with this approach, especially within quantum field theory, where 'particle number' features as an operator, allowing superpositions between definite numbers of bosons. The problem here is that there won't always be a definite number of relata for these alleged relations to hold between. In any case, even if entanglement relations could be successfully introduced, all that would follow is that there would be two empirically open scenarios: entanglement relations and holistic systems. As long as the holism scenario remains open, there will remain an empirically open scenario that the maximal nihilist can cover but the minimal nihilist can't, which was what was wanted.

In defence of 14, the maximal nihilist's ontology of the world is rich enough to support quantum entanglement. If the world contains entangled subsystems, then that is one aspect that the world might have. For instance, it might be S1-ish here-and-there-ishly.

Indeed, there is reason to think that the universe is one vast entangled system. The universe begins in the explosion of the primordial atom (the Big Bang), and such interaction suffices for entanglement. Thus Toraldo di Francia says: 'Since any particle has interacted with other particles in the past, the world turns out to be *nonseparable* into individual and independent objects. The world is in some way a single object' [1998: 28]. In this vein, Gribbin notes:

> Particles that were together in an interaction remain in some sense parts of a single system, which responds together to further interactions. Virtually everything we see and touch and feel is made up of collections of particles that have been involved in interactions with other particles right back through time, to the Big Bang... Indeed, the particles that make up my body once jostled in close proximity and interacted with the particles that now make up your body. We are as much parts of a single system as the two photons flying out of the heart of the Aspect experiment.
>
> [1984: 229]

Thus the nihilist looks to have no alternative to monism. Only the maximal version of nihilism can account for the empirically likely scenario of one vast entangled universe. Even medial nihilism is not enough.

To put the argument from emergence in another light, we might invite the nihilist again to 'indulge in the fiction' of classical mereology with decomposition, and to consider an emergent version of the three-atom model (§III), in which the top node (U) contains an emergent property. The classical mereologist can account for such emergence because she countenances U (*inter alia*). The maximal nihilist also countenances U, so the maximal nihilist image of the emergent version of the three-atom model is sufficient.[29] But the minimal nihilist only countenances x, y, and z, and their spatiotemporal arrangement. The minimal nihilistic image of the emergent version of the three-atom model is thus insufficient. With emergence the whole is more than the sum of its parts.

Is there any competing sense in which 1 may be more plausible than 5? Are there other scenarios that the minimal nihilist might invoke to turn the tide? I doubt it, since if there is a particle explanation as per 1, then there will also be a world-based explanation of 5. Indeed, it is trivial to translate the particle-explanation into a world-explanation.

[29]One might also imagine an emergent version of the three-atom model in which an intermediate node, say r, contains an emergent property. The maximal nihilist image does not contain r, but it does contain U, which has an r-ish aspect here-and-there-ishly (where 'here' and 'there' are the fictive locations of x and y). So whatever one should say about the emergent properties of r can be paraphrased via U's r-ish aspect.

The translation takes as input the number, properties, and arrangements of the particles. For x particles with y properties in a spatiotemporal arrangement of z dimensions, the translation outputs a world in an xyz-dimensional configuration space. For instance, if we have ten particles with six fundamental physical parameters in a four dimensional space-time, then all of this information can (trivially) be represented in a two-hundred-and-forty-dimensional configuration space. So I would conclude that, with respect to covering scenarios, *5 dominates 1*.[30]

Putting the arguments from infinite descent and emergence together: the minimal nihilist's premise 1 represents the atomistic, mechanistic worldview of a nineteenth century physicist. The maximal nihilist's premise 5 is more plausible in allowing for not just an atomistic, mechanistic world, but in also allowing for infinite descent and emergent phenomena (such as quantum entanglement). The nihilist may take this result as a victory. For it shows that, despite the appearances, nihilism *is* compatible with both infinite descent and emergence. But such a victory can only be earned by going monistic.

VII. Ontological Simplicity

The third way that the mereological nihilist gains by embracing existence monism is by reaching the simplest sufficient ontology. The main motivation for nihilism, after all, is that it provides a simple yet sufficient ontology. This motivation is implicit in the nihilist's dismissal of explanatory redundant and epiphenomenal entities, as per 3 and 7. Why posit composite sums of particles, the minimal nihilist demands, when the particles suffice? Why multiply entities without necessity?[31]

The nihilistic quest for the simplest sufficient ontology culminates in monism. For what could be simpler, or more elegant, than a one-object

[30]Caveat: it is not obvious that the laws backing the particle explanation will be preserved in the translation. So it is possible that one of the explanatory schemes will have the advantage in simplifying the operative laws. In the main text I must ignore this complication.

Here one referee wondered whether there can be *submergent properties*, which would be intrinsic properties of proper parts which do not supervene on the intrinsic properties of the whole and its spatiotemporal arrangement ('submergence' is here being used as the converse of 'emergence', to describe a scenario in which top-down mereological supervenience fails). There cannot be submergent properties. This is because, for every intrinsic property of a proper part, there corresponds an intrinsic property of the whole, specifically the intrinsic property of having-a-proper-part-with-such-an-intrinsic property. To illustrate: if my leg has the intrinsic property of being bent, then my body has the intrinsic property of having a leg that is bent. Intrinsic properties always rise upwards through the mereological hierarchy, but do not always sink downwards (in the case of emergence). This mereological asymmetry with respect to intrinsicness is the reason why there can be emergent properties but there cannot be submergent properties. (See Schaffer [forthcoming: §2.2] for further discussion of the emergence/submergence asymmetry.)

[31]Thus Dorr [2001: 36] motivates nihilism as 'default reasonable' based on the following methodological considerations:

> The presumption that there aren't any composite things rests, I think, on a more general principle: other things being equal, one ought to believe that the world is a simpler place, rather than a complicated one. But for there to be interesting mereological relations among things is for the world to be complicated, in a certain respect.

The monist is simply following such methodological considerations to their ultimate end.

ontology?[32] In this vein, Horgan and Potrč argue for monism ('blobjectivism') on grounds of parsimony [2000: §2.4]. Here it may be worth recalling the words of James from 1908, who felt a need to apologize for defending the 'turbid, muddled, gothic sort of an affair' that pluralism involves:

> It is curious how little countenance radical pluralism has ever had from philosophers. Whether materialistically or spiritually minded, philosophers have always aimed at cleaning up the litter with which the world apparently is filled. They have substituted economical and orderly conceptions for the first sensible tangle; and whether these were morally elevated or only intellectually neat, they were at any rate always aesthetically pure and definite, and aimed at ascribing to the world something clean and intellectual in the way of inner structure. As compared with all these rationalizing pictures, the pluralistic empiricism which I profess offers but a sorry appearance. It is a turbid, muddled, gothic sort of an affair, without a sweeping outline and with little pictorial nobility. Those of you who are accustomed to the classical constructions of reality may be excused if your first reaction upon it be absolute contempt—a shrug of the shoulders as if such ideas were unworthy of explicit refutation. But one must have lived some time with a system to appreciate its merits. Perhaps a little more familiarity may mitigate your first surprise at such a programme as I offer.
>
> [1987: 650]

Pluralism would, of course, come to dominate the twentieth century, largely because analytic metaphysics accepted the 'commonsense' commitments recommended by Russell and Moore (§IV). But once the nihilist allows herself to paraphrase away such commitments, she may also paraphrase away her pluralism. She has nothing to lose, and can cover more empirically open scenarios and gain greater simplicity thereby. Thus nihilism culminates in monism.

VIII. Concluding Fragments

I have argued that mereological nihilism culminates in existence monism. Where the explanatory exclusion argument and the quest for ontological simplicity lead is to an ontology of one vast world-atom, rather than many wee particles. Our Occamite principles lead to a Parmenidean ontology.

All of this remains neutral on nihilism itself. That is, the argument that nihilism culminates in monism is compatible with nihilism, with

[32]How about a zero-object ontology? [Hawthorne and Cortens 1995; Burgess and Rosen 1997] offer paraphrase strategies for the *existential nihilist*. But it seems to me that the existence of *something* is required, for the modes to be *modes of*. In this vein, Descartes [1984: 196] writes:

> We should notice something very well known by the natural light: nothingness possesses no attributes or qualities. It follows that, whenever we find some attributes or qualities, there is necessarily some thing or substance to be found for them to belong to.

Given that the existence of something is required, no ontology simpler than monism can be sufficient. Given that monism is sufficient, that there is no rival one-object ontology in the offing, and that there is no compensating complexity elsewhere in the monistic ontology, it follows that monism is the simplest sufficient ontology.

anti-nihilism, and even with scepticism about the whole dispute. Thus the nihilist might trumpet monism as a further advance for her theory. The anti-nihilist might parade monism as a deeper embarrassment for her rival. And the sceptic might maintain equipollence, denying that there is any principled way to decide between pluralistic anti-nihilism and monistic nihilism.

What emerges is a fragmentation of commonsense. Commonsense embraces tables and chairs, persons and families, rocks and planets; but it also embraces methodological principles that dismiss such as needless. After all, our Occamite principles do not come from nowhere. They too seem a part of commonsense. So with respect to whether there is a plurality of concrete objects, commonsense ontology screams *yes*, while commonsense methodology whispers *no*.

What is needed is a principled way to decide which voice of commonsense to heed. I part with a threefold suggestion for how the anti-nihilist might proceed.[33] First, I think the anti-nihilist should deny equipollence. She should uphold commonsense ontology with Moorean stridency, as being far more plausible than any Occamite principles to the contrary. *Of course* whole and part both exist. There is the world, you and I, and all of our various parts. Who could deny it?

Second, I think the anti-nihilist should take the lesson of the exclusion argument to be that Occam's Razor must be blunted (so that 3 and 7 may be denied). There is redundancy in what exists, but such redundancy is mitigated. For there is a *hierarchy*—some things are basic, and some things are merely derivative. Redundancy is tolerable provided the redundant entities are properly grounded in what is basic. What is intolerable is redundancy in what is basic.

Putting the first two parts of the suggestion together, my advice to the anti-nihilist is to restrict Occam's Razor so that it only applies to what is basic:

> Do not multiply *basic* entities without necessity (but help yourself to derivative entities).

This is a minimal and motivated restriction, yielding a simultaneous reply to the nihilist and the sceptic. The reply to the nihilist is to reject the exclusion argument by denying 3 and 7. The reply to the sceptic is to deny fragmentation, since commonsense methodology (as just rendered) does cohere with commonsense ontology.

The anti-nihilist who would take this advice recognizes both whole and part, but denies that both can be basic (on pain of redundancy amongst the basic). She thereby invites the question of which is basic. Thus arises *the question of priority*, which is the question of whether part is prior to whole, or whole is prior to part. For the *priority pluralist* part is prior to whole, and so what is basic (ultimately prior) are the many ultimate parts. You and I and the world all exist, but merely as aggregates of particles. We are heaps.

[33]This is intended as a parting glimpse beyond the present discussion, towards the view developed in Schaffer [forthcoming].

For the *priority monist* (§II) whole is prior to part, and what is basic is the one ultimate whole. You and I and our various parts all exist, but merely as fragments of the world. We are shards.

My third and final suggestion to the anti-nihilist is to endorse priority monism. For the arguments from nihilism to existence monism will equally serve as arguments from anti-nihilism to priority monism. Thus infinite descent shows that the ultimate parts can't be basic, because in such a scenario there are no ultimate parts to be basic. Emergence shows that the ultimate parts can't be basic, because in such a scenario the whole is more than the sum of such parts. And the quest for the simplest sufficient basic ontology favours one basic whole. Thus I part with the following speculative suggestion: just as mereological nihilism culminates in existence monism, so anti-nihilism may culminate in priority monism.[34]

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