

Against Parthood*

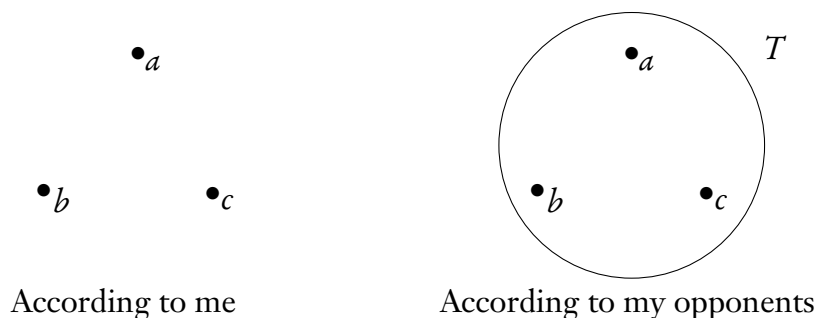
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I will defend what Peter van Inwagen calls nihilism: composite entities (entities with proper parts) do not exist.¹ This formulation needs refining, but it will do for now.

Nihilism may seem absurd. For the world of common sense and science consists primarily of composite entities: persons, animals, plants, planets, stars, galaxies, molecules, viruses, rocks, mountains, rivers, tables, chairs, telephones, skyscrapers, cities... According to nihilism, none of these entities exist.

But it is not absurd to reject such entities if one accepts their noncomposite subatomic particles. Consider three subatomic particles, *a*, *b*, and *c*, arranged in a triangular pattern. According to me, there exist only three things here: *a*, *b*, and *c*. According to others, there also exists a fourth thing, *T*, which contains *a*, *b*, and *c* as parts. Picture our disagreement thus:



My opponents and I agree on the intrinsic states of the particles, for example their charges and masses. And we also agree on their spatial arrangement.

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¹van Inwagen (1990). Other nihilists include Cian Dorr (2002, 2005) and Ross Cameron (2010b). See Dorr and Rosen (2002) for a defense—partly overlapping the present one—of nihilism against objections. For stylistic reasons I often speak of existence, but like the good Quinean that I am, I intend such remarks to be recast in terms of quantification.

Further, we agree that nothing else is present, beyond the subatomic particles and any objects that may be composed of them. Our sole disagreement is over whether these subatomic particles, which are “arranged triangle-wise” (to use van Inwagen’s phrase), are accompanied by T —a triangle, let’s call it—which is composed of them.

Since I accept the particles arranged triangle-wise, my denial of the triangle’s existence isn’t absurd. Denying that T exists *in addition to* a , b , and c is no more absurd than denying that holes exist in addition to perforated entities, or denying that smirks exist in addition to smirking faces. Similarly, denying the existence of persons, animals, plants, and the rest is not absurd if it’s coupled with the acceptance of subatomic particles that are arranged person-wise, animal-wise, plant-wise, and so on.

Indeed, it would seem that ordinary evidence is neutral as between the hypothesis that composite objects exist and the hypothesis that there exist only appropriately arranged particles. Which hypothesis is correct is thus an open philosophical question, like the question of whether there exist holes and smirks.

That is just the first skirmish; a series of battles is yet to be fought. Some say that the existence of persons and other composites is common sense; others say that we know of composites through perception; still others say that the dispute between nihilists and their opponents is merely verbal. But before discussing these and other challenges to nihilism, I should say why I think that it is true.

1. The argument from ideological parsimony

Quine (1951*a*) famously distinguished between ideology and ontology. A theory’s ontology consists of the objects that the theory posits—the range of its quantifiers, if the theory is to be true. Its ideology consists of the undefined notions it employs, both logical and extra-logical. In addition to eliminating composite objects from our ontology, nihilism also allows us to eliminate the extra-logical (or perhaps quasi-logical) notion of ‘part’ from our ideology, and this kind of ideological simplification is an epistemic improvement.² Put another way, nihilism is an ideologically simpler theory, and therefore is more likely to be true.³

²Thus the “semi-nihilism” of van Inwagen (1990) and Merricks (2001) is quite different from nihilism. They admit some composites, and so cannot eliminate parthood.

³This argument was inspired by Cian Dorr’s (2005) claim that nihilists ought to regard

This argument from ideological parsimony is, I think, more powerful than the argument that nihilism is ontologically parsimonious. Many agree that simply reducing the number of entities one posits isn't a particularly important goal of parsimony.⁴ Also, many defenders of parts say that there is something distinctive about parthood which makes commitment to mereologically complex entities somehow "innocent".⁵ These thoughts may defend wholes made up of parts against the argument from ontological parsimony, but neither defends the part-whole relation against the argument from ideological parsimony.

The argument presupposes an epistemic principle: ideologically simpler theories are more likely to be true. Compare the common belief amongst philosophers of physics that neo-Newtonian spacetime is simpler and hence more choiceworthy than Newtonian spacetime. The difference in simplicity has nothing to do with ontology. The same points of spacetime exist according to the two theories (and neither needs to reify relations over points of spacetime). Instead, the difference concerns ideology. Describing neo-Newtonian spacetime requires a certain ideology, such as the notion of three points being on a straight line through spacetime; describing Newtonian spacetime requires this ideology and then some further ideology as well: the notion of two points of spacetime being at the same absolute position. Given the added ideology of the Newtonian theory, the spacetime that it describes has more structure, is more complex.

The epistemic principle should be restricted to theories about the fundamental nature of the world (such as physics and, by my lights, mathematics and fundamental metaphysics), since it is far less clear that lean ideology is truth-conducive in biology, economics, and geology, let alone in everyday non-scientific contexts. Thus it is no objection that nihilists must use ideology like 'arranged plantwise', 'arranged dollar-bill-wise', 'arranged riverwise', and so forth to describe reality's biological, economic, and geological features—these predicates are not part of the nihilist's theory of fundamental matters.⁶ We may therefore rephrase and expand the argument from ideological parsimony as follows: if one's theory of fundamental matters included an ontology of composite objects, then that theory would presumably also need a predicate of parthood to connect those composites to their parts; but without the composites, the predicate isn't needed.

'part' as being a failed natural kind term.

⁴See Lewis (1973, p. 87), although see Nolan (1997).

⁵See Lewis (1991, section 3.6); see also Armstrong (1997, 2.12).

⁶Thus I can reply to Bennett (2009, p. 64).

The presupposed epistemic principle is most naturally paired with a metaphysical realism about ideology. Ideologically simpler theories aren't just more convenient for *us*. The worlds that they purport to describe are objectively simpler, contain less structure. Ideology is a worldly matter, not about ideas at all.⁷

Simple ideology is not the only epistemic virtue. Choiceworthy theories must also be compatible with our evidence and predict as much of it as possible. And they must also have simple and powerful laws. It is when theories are tied with respect to these other factors that we turn to simplicity of ideology. Such is the case with Newtonian and neo-Newtonian spacetime. And on the face of it, such is also the case with nihilism and its competitors. For our best theories of fundamental matters—physics and, I say, mathematics and fundamental metaphysics—have no need for composite objects. Deleting ‘part of’ and all reference to composite objects in these theories does not weaken their predictive power, nor does it weaken their laws or make them more complex (but see section 11).

Actually, the fact that choiceworthy theories must have simple laws gives us a separate—though closely related—reason to accept nihilism, beyond ideological economy.⁸ A theory of fundamental matters that included an ontology of composite objects would not only need a predicate of parthood to connect the composites to their parts; it would presumably also contain laws governing the behavior of that predicate (laws of “mereology”). Eschewing the composites thus allows us to simplify the laws in our theory of fundamental matters, and not just its ideology.

So the situation is this: i) ordinary evidence apparently leaves open whether composites exist or whether there exist only appropriately arranged particles; and ii) parsimony, concerning both ideology and the laws, gives us a positive reason to reject parthood, and thus composites. Does anything counterbalance this case for nihilism?

The opposing case for composite objects is surprisingly weak. Many arguments for parts-based ontologies are really just arguments against other

⁷See Sider (2011).

⁸It also lets us reply to the objection that adopting parthood in fundamental theories allows the elimination of identity from ideology via the definition “ $x = y =_{\text{df}} x$ is part of y and y is part of x ”. The savings in ideological parsimony would be outweighed by increased complexity in the laws, which I construe broadly to include laws of logic and metaphysics. The logical laws governing ‘=’ must now be rewritten in terms of the proposed definition, making them more complex; and further, laws of mereology will be needed. Thanks to Steve Steward.

parts-based ontologies, and so do not support their intended ontologies any better than they support nihilism. For example, David Lewis's argument from vagueness in favor of universalism is really just an argument against middling views according to which some collections compose and others do not; it does not threaten the nihilistic view that collections never compose.⁹ And the familiar paradoxes of coinciding objects, which are so nicely resolved by a temporal parts metaphysics combined with composite objects, are resolved just as well by a nihilist metaphysics.¹⁰ Still, some arguments are genuinely directed against nihilism, including:

1. nihilism goes against common sense
2. knowledge of composites is given in perception
3. the existence of composites is part of our evidence, given Timothy Williamson's conception of evidence
4. we are entitled for Cartesian reasons to believe in our own existence
5. the denial of composite objects is conceptually incoherent.
6. nihilism is incompatible with "atomless gunk"
7. parts and composite objects are required by spacetime physics

Some of these have been given in print, others not. In what follows I will rebut these arguments. The final argument is the most powerful one, and my response will be tentative.

2. Mooreanism

Recent metaphysics, especially in the tradition of David Armstrong, Saul Kripke and David Lewis, has been dominated by a sort of "Mooreanism", according to which being "common sense" counts in favor of truth.¹¹ Theories that are

⁹Lewis (1986, 212–13). See also Sider (2001, chapter 4, section 9).

¹⁰Merricks (2001, 38–47). See Sider (2001, chapter 5) for a survey of the relevant issues.

¹¹This view seems to be much more prevalent amongst metaphysicians than amongst epistemologists. I do not attribute the view to Armstrong, Kripke, or Lewis (or Moore, for that matter) themselves. Excepting a few passages (notably *Naming and Necessity* pp. 41–2), what has been most influential in their writings is not explicit endorsement of Moorean epistemic principles, but rather a pervasive attitude of respecting common sense (think of the phrase "Moorean fact"). And let me also distinguish what I am calling Mooreanism from some alternatives. Alternative 1 insists merely on the propriety of performances like this: "I have

consistent with common sense are preferable to those that contradict common sense; common sense is an epistemic difference-maker. According to some it is nearly decisive; according to others it is one factor among many. Either way, Mooreanism seems to give us an (at least *prima facie*) argument against nihilism, since the existence of tables, chairs, and other composites is as commonsensical as it gets.

But on the face of it, Mooreanism is absurd. Why should the inherited prejudices of our forebears count for *anything*?

Everyone recognizes the initial force of this; why then are so many metaphysicians Mooreans? Because of a powerful, yet mistaken, I think, line of thought: that if we reject common sense then there will not be enough to go by.¹² Both metaphysics and inquiry generally, it is thought, would be paralyzed. Without Mooreanism, we could not reply to the external-world skeptic, for example; we could not dig in our heels and say: *of course* there is an external world!

But again a flat-footed answer tempts. The dictates of common sense are often independently reasonable, and when they are, they do not need backing from common sense. Reason can stand on its own.

Consider Russell (1912) and Quine's (1948) answer to the external-world skeptic: it is reasonable to posit a world of external objects because this posit best explains our sensory experiences.¹³ However exactly we cash out the notion of inference to the best explanation, this sort of inference need not be rooted in its commonsensicality. Inference to the best explanation is just: reasonable!

The objection to Mooreanism is not that common sense must be shown to be reliable before it can justify. We should not require the reliability of all

reason to reject the conclusion of your argument, and thus, reason to believe that at least one of its premises is false". This innocuous point about argumentative dynamics does not threaten nihilism; one would need to establish independently that nihilism's implications are reasonable to reject. Alternative 2 says that the claims of common sense, many them, anyway, are in fact justified, but not because they're common sense. My response here would depend on the alleged alternate source of the justification (if the source is perception, for example, my response is as in section 5). Alternative 3 says that common sense beliefs are pragmatically, not epistemically, justified. 3a: we should believe them because we could not get along without them. 3b: we may continue to believe them because we already believe them and we can't start from scratch (compare Lewis (1986, pp. 134–5)). But we *can* get along without belief in tables and chairs, if we believe instead in particles arranged tablewise and chairwise; and this doesn't require starting from scratch.

¹²See, e.g., Zimmerman (2007).

¹³See also Vogel (1990).

sources of justification to be antecedently demonstrable—and I do not require this of inference to the best explanation—because that would apparently lead to skepticism. The objection is a simpler one: commonsensicality is just not a source of justification.

Some Mooreans disavow the form of argument

It is common sense that ϕ
Therefore, ϕ

Instead, they simply insist on:

ϕ

where ϕ is in fact common sense. They do not infer that tables exist from the fact that common sense says that tables exist; so, it may be thought, they do not rely on the prejudices of our forebears. Rather, they simply take as a premise: there are tables.

This maneuver is just a fig leaf. These propositions that Mooreans simply take as premises exhibit a striking pattern: they include all the dictates of common sense. Given this pattern, if the status of common sense as a source of justification is challenged, it would seem stubbornly unselfaware to ignore the challenge and continue insisting on the premises. Consider a man who believes (perhaps defeasibly) whatever his mother believes, about a wide range of subjects. He doesn't cite that as evidence, but we detect this pattern in what he's saying, and point it out to him. Surely he must then accept that being believed by his mother confers epistemic worth, or else find some other positive epistemic status (or statuses) shared by his beliefs. He shouldn't just go on exhibiting the pattern.

There is a further reason to dislike the Moorean approach to metaphysics; but first we must consider the relationship between nihilism and ordinary language.

3. Ordinary and fundamental languages

The Moorean argument assumes that nihilism contradicts common sense beliefs about composites. This assumption is incorrect if the ordinary believer and the nihilist mean different things by sentences like 'there are tables and chairs', so that the nihilist's denial of such sentences is compatible with the believer's assertions. And this may well be the case.

Consider Nihilo, god and creator of a world comprised solely of subatomic particles. On the first day Nihilo creates some particles and arranges them in beautiful but lifeless patterns. But he becomes lonely, so on the second day he creates some minions (or rather, particles arranged minion-wise). On the third day he tries to teach his minions to speak. But this goes badly. The dim-witted minions struggle to understand Nihilo's talk of subatomic particles and their physical states. So on the fourth day he teaches them an easier way to speak. Whenever an electron is bonded (in a certain way) to a proton, he teaches them to say "there is a hydrogen atom"; whenever some subatomic particles are arranged chairwise he teaches them to say "there is a chair", and so on. (Pretend that electrons and protons have no proper parts.)

When the minions utter sentences like 'there is a hydrogen atom', do they speak falsely? They do if their language is the same as the language I used to describe the example, since I described Nihilo as having created a world comprised solely of subatomic particles. But perhaps the minions' language is different; perhaps what the minions mean by 'there is a hydrogen atom' is consistent with I meant in my description of the example when I said "the world is comprised solely of subatomic particles". Perhaps, for example, what the minions mean by 'there is a hydrogen atom' is true iff, as I (and Nihilo) would put it, some electron is bonded to some proton.¹⁴ In that case the minions speak truly.

So there's a question of whether the minions speak truly or falsely. But even if the minions speak falsely, there is an important distinction to make amongst their falsehoods. Nihilo taught them to utter "there is a ϕ " in certain circumstances; call such utterances *correct* iff the specified circumstances in fact obtain. Correct utterances, even if untrue, play a very similar role in communication and thought to the role played by true ones. For example, telling a visiting philosopher-minion from Iowa riding the N train that "The NYU philosophy department is near the 8th street stop" will have the desired effect; telling her that "The NYU philosophy department is near the Astoria-Ditmars Boulevard stop" would not. Neither sentence is true, but the first and only the first is correct; usefulness here tracks correctness, not truth. Again: if confronted, in ideal perceptual conditions, by particles arranged chairwise, a minion would be warranted in thinking to himself "there is a chair", and saying

¹⁴If Nihilo had created a world more like the world I believe in (see section 11), containing impure sets as well as subatomic particles, then another possibility would be that the minions' sentence is true iff there is a set containing an electron and a proton bonded to each other.

this to others—or at least, more warranted than thinking and saying various alternatives, such as “there is an elephant”.

If nihilism is true, we speakers of ordinary language are like Nihilo’s minions. We’re trying to find our way in a world with a minimal ontology, we know little if any particle physics, and we certainly don’t have enough computational power to derive useful conclusions from what we do know about particle physics. It’s useful to say things like “there is a chair” when there are some subatomic particles arranged chairwise, even if there really aren’t any chairs—just as it’s useful for the minions to speak as instructed on the fourth day. Indeed, it would be sensible for creatures like us to adopt a system of conventions or norms that prescribe saying things like “there is a chair” in appropriate circumstances. Perhaps we speak falsely (though correctly) when we say such things. But perhaps instead we speak truly. Just as there’s a question of whether the minions’ sentence ‘there is a hydrogen atom’ is true iff (as Nihilo and I would put it) some electron is bonded to some proton, so there’s a question of whether the same is true for English.

My last few sentences skirt paradox. I defend nihilism, which I defined as the claim that there are no composite entities. Wasn’t I speaking English when I said this? If so, how can I be open to the possibility that English sentences like ‘there is a hydrogen atom’ and ‘there is a chair’ are true?

Distinguish the ordinary English sense of ‘there is’ from its sense when made in the context of doing ontology. When I used the phrase in my definition of nihilism, I intended it in the latter sense—the ontologist’s sense. If the ontologist’s sense differs from the ordinary English sense, then nihilism is consistent with the claim that ‘there is a hydrogen atom’ is true in ordinary English. Perhaps, for example, the truth-condition for this sentence in ordinary English is that it be true in the ontologist’s sense that some electron is bonded to some proton.

Ontologists increasingly agree that taking their subject seriously requires making some sort of distinction between ordinary and ontological understandings of existence-claims.¹⁵ It’s not just defenders of minimal ontologies that find the distinction useful. Even defenders of fuller ontologies sometimes deny the existence of *some* ordinary things, so to speak, such as holes and shadows (McDaniel, 2010), propositions and numbers, or economies and organizations,

¹⁵See Cameron (2010*b,a*); Dorr (2005); McDaniel (2009); Sider (2009, 2011); Turner (2010). A seminal work is Fine (2001), which argues that a related distinction is needed throughout metaphysics; see also Fine (2009).

and may wish to say that ordinary claims about such ordinary things are true.

It's not enough merely to distinguish the languages; ontologists also need an asymmetry between them. If there's nothing special about the ontologist's language—if it's just one language among many—then why make such a big deal over what's true in it? Ontologists have therefore tended to say that their language is distinguished by being *fundamental*. It gets at the facts more “directly” or “perspicuously” than do nonfundamental languages; it expresses the facts that “underly” all other facts.

(What “underlying” amounts to is a complex issue. Here I will say only that ordinary speakers needn't have any idea of what unfathomably complex reality underlies their ordinary utterances, just as they needn't have any idea of the fundamental physics that underlies their ordinary utterances.)

It might be objected that since ontology has traditionally been understood as being about *what there is*—i.e., what there is in the ordinary sense—I have simply changed the subject. But I think that fundamental ontology is what ontologists have been after all along. It's what they've been fumbling for with misguided talk of what “strictly” or “literally” exists. And it's certainly in line with the traditional conception of metaphysics as inquiry into the ultimate nature of reality.

There are subtle questions about how exactly to understand this notion of fundamentality (see Sider (2011, chapter 7)). Although I will generally remain neutral, one point does need to be addressed: ‘fundamental’ is *not* a predicate of entities. If it were, one would expect nihilism to be defined as the view that all fundamental entities are noncomposite—a view that might be regarded as innocuous because universally accepted.¹⁶ The nihilist picture is not: there exist both composite and noncomposite entities, but only the latter enjoy a certain status, namely, being a “fundamental entity”. The picture is rather: in the fundamental sense of ‘exists’, there simply do not exist any composite entities. To reject this picture, you don't have to think that “tables and chairs are fundamental entities”. Rather, you have merely to think that in the fundamental sense of ‘exists’, there exist tables and chairs. You might even combine this with the view that tables and chairs are in some sense “nonfundamental entities” (perhaps in the sense that all of their properties are nonfundamental).¹⁷

Also, it's important not to equate “exists in the fundamental sense” with “strictly and literally exists”, as it's often put. If ‘I exist’ is true in English then

¹⁶Though see Schaffer (2010).

¹⁷See Sider (2009, section 9).

its truth is both strict and literal, in any normal sense. “Literal” is opposed to things like metaphor and hyperbole; “strict” casts off things like quantifier domain restriction and loose talk (as when people who live in Cherry Hill, New Jersey say they’re “from Philadelphia”¹⁸); and ‘I exist’ is neither metaphorical nor hyperbolic nor restricted nor loose.

Nihilism, then, may be reformulated as the view that *in the fundamental sense*, there are no composite entities.¹⁹ Revisiting the Moorean argument is the task of the next section.

4. Mooreanism again

Mooreanism assumes that consistency with common sense makes an epistemic difference. Common sense consists of propositions believed by ordinary people; and the propositions that ordinary people believe are those expressed by ordinary sentences. In the case at hand, these are ordinary sentences like ‘there are tables’. So according to Mooreanism, in order to decide whether to accept nihilism, we must ascertain whether nihilism allows such ordinary sentences to be true. If nihilism allows them to be true then it passes the Moorean test, and we have no common-sense-based reason to reject nihilism. But if nihilism pro-

¹⁸See Sperber and Wilson (1986); Wilson and Sperber (2004).

¹⁹The language of this formulation cannot be a perfectly fundamental one since it contains ‘composite’, which is defined in terms of ‘part’. The language must instead be a mixed one, with fundamental quantifiers but nonfundamental predicates. But there are arguments purporting to show that all such languages are suspect (see my 2007a, section 2.7 and 2011, section 9.6.1). Also, in this mixed language, ‘part’ might be semantically empty, since it might have no suitable basis in the fundamental. (Entire sentences containing ‘part’ in the language of the minions can be given a basis in the fundamental, but that language’s quantifiers are not fundamental.) The latter concern could be addressed by making the claim metalinguistic: “‘there are composites’ is not true”. This is an improvement but doesn’t capture the form of nihilism discussed at the very end of the paper, which identifies ordinary objects with sets: on this view, ordinary objects like tables and chairs *do* exist in the fundamental sense (since they’re sets), and they satisfy the nonfundamental predicate ‘composite’ (their “parts” are their subsets). So perhaps we should return to a perfectly fundamental language, give up on a *general* formulation of nihilism, and instead formulate particular nihilistic ontologies, such as “Everything is a fundamental particle”, “Everything is a point of spacetime”, “Everything is either a point of spacetime or a set”, and so on. (These formulations must be cleaned up since ‘point of spacetime’, ‘fundamental particle’, and ‘set’ are probably not fundamental predicates. The third one, for example, can be cleaned up as follows: “There is exactly one thing that has no members but is not a member of any open thing [this is the null set]; everything else either has a member [and so is a set], or is a member of some open thing [and so is a point of spacetime]”).

hibits their truth (albeit allowing their correctness), then it fails the Moorean test, and we have our common-sense-based reason to reject nihilism.

Whether nihilism allows these sentences to be true turns on where the boundary between truth and mere correctness lies.²⁰ This is a hard issue. Recall Eddington's (1928) claim that because of the mismatch between our ordinary conception of solidity and the scientific fact that matter is largely empty space, the ordinary notion of solidity has no application in our scientific world—ordinary objects like tables aren't really solid. Most philosophers nowadays think that Eddington was wrong about the table; tables are indeed solid; it's just that common sense was wrong about what it takes to be solid. But sometimes an Eddingtonian stance *is* correct. However commonsensical it was that mental illness is caused by demonic possession, that simply wasn't (and isn't) true. No one would say that mental illness *is* caused by demonic possession, it's just that common sense was wrong about what it takes to be possessed by a demon. The hard general question is this: how distant from our ordinary ways of talking can the underlying facts get, before what we say counts as false (albeit correct)?

As I say, this is a hard issue. Now, one response to the Moorean argument against nihilism would be to take a stand on this hard issue, argue for a liberal conception of when ordinary sentences are true in a hostile metaphysical environment, and so argue that nihilism doesn't after all conflict with common sense (Cameron, 2010*b*; van Inwagen, 1990, chapter 10). But this is not how I want to respond to the Moorean argument (though I suspect that the liberal conception is indeed correct). My response is rather that what we say about the hard issue cannot possibly have the epistemic significance that Mooreanism requires it to have. The question of when Eddingtonian views are true is of no deep epistemic importance; so the important question of whether it's reasonable to believe nihilism can't turn on how we resolve it; so Mooreanism can't be right.

It's an interesting question whether Eddington was right that the ordinary sentence 'tables are solid' is falsified by modern atomic theory. But how we resolve this question surely carries no weight when one is deciding whether to believe modern atomic theory. It is intuitively clear that, rather than using our

²⁰Caveat: suppose 'there exists' in ordinary English functions analogously to theoretical terms in science—it is intended to mean something fundamental, whatever fundamental is "in the vicinity", regardless of whether it satisfies our ordinary conception of the term. I doubt this is the case; but if it is, then given nihilism, 'there are tables' will be false regardless of how much metasemantic tolerance there is, and the argument of this section won't apply. (But Mooreanism is even less plausible for claims phrased using theoretical terms.)

prior beliefs about whether tables are solid to decide what to believe about the atomic theory, we ought instead to decide on independent grounds whether the atomic theory is correct, and whether Eddington was right about the connection between the atomic theory and solidity; and we ought then to use our answers to those questions to decide whether to believe that tables are solid.

The Eddingtonian question is that of how much “metasemantic tolerance” there is—how much error there can be in our ordinary conception of a term before paradigmatic sentences containing the term become false. Its answer lies in metasemantics, in how semantic facts are determined. Consider how we determine how much metasemantic tolerance there is. We think about our reactions to Eddington’s argument, and our reactions to metasemantic thought experiments like: “if the things we call ‘cats’ were discovered to be robots, would they still be rightly called ‘cats’?” Surely our reactions to these thought experiments carry no weight when it comes to deciding what to believe about the atomic theory, or about nihilism.

It might be objected that my argument illegitimately semantically ascends. I construed the Moorean as demanding consistency with *the truth of certain sentences*. But, it might be claimed, what she demands is rather consistency with my having a hand, with the existence of tables, with murder being wrong.... If so, Mooreanism does not concern sentential truth, and so, it may be thought, Mooreanism does not make epistemic value depend on metasemantics.

This response is like the fig-leaf maneuver at the end of section 2. Mooreanism says that reason demands that we accept certain propositions p_1, p_2, \dots . Although these propositions are exactly the propositions that are expressed by the sentences of common sense, the Moorean now insists that it’s not under this description that reason demands that we accept them. But then, under what description *does* reason demand that we accept them? To refuse to answer would be unsatisfying. And to answer that the p_i are justified by some further feature they have—that they best explain our evidence, say—would be to give up on Mooreanism.

The Moorean might answer that the p_i are justified because they’re *propositions* of common sense, where this status attaches directly to the propositions, and is not due to the fact that they’re expressed by commonsensical sentences. But this would render Moorean justification chauvinistic in the following way. Suppose for the sake of argument that nihilism is true and that English is a metasemantically intolerant language, so that ‘there are tables’ is in fact false. The Moorean says that the proposition that there are tables is a proposition of common sense, and that we therefore have a common-sensed-based reason

to reject nihilism. But imagine we had spoken a slightly different language, *L*, which is a lot like English but differs in its metasemantic tolerance, so that ‘there are tables’ is true in *L* (it is true in *L* iff there are things arranged tablewise). We could, I think, easily have spoken such a language simply by using ‘true’ and other semantic vocabulary more liberally in conjunction with reflective discussions of Eddington’s table, thought-experiments about robot cats, and the like (while continuing to use such semantic vocabulary disquotationally, insofar as we actually do). The difference between being a speaker of *L* and being a speaker of English would only show up in highly theoretical contexts, for example contexts in which the speaker is aware of the question of nihilism and the distinction between fundamental and nonfundamental uses of language. Think, now, of the plight of speakers of *L*. They are cut off from the justification to reject nihilism that we speakers of English so effortlessly possess. For that justification comes from the fact that nihilism is inconsistent with the proposition that there are tables; and ordinary speakers of *L* have no sentences that express this proposition. (Their sentence ‘there are tables’, remember, does not express that proposition since it is true iff there are things arranged tablewise.) Only philosophically sophisticated speakers of *L* could even formulate this proposition (using the sentence ‘there are, in the fundamental sense, tables’), and it’s hard to see why they should recognize the proposition in this guise as one of common sense. The problem with this Moorean answer, then, is that it makes our access to Moorean justification precarious in an implausible way; we could not have accessed it if we had used semantic vocabulary in an innocuously different way.

At the beginning of this section I refrained from defending nihilism by appealing to a liberal view about metasemantic tolerance. I did so not only because I am not entirely sure whether liberalism is correct, but also because I doubt that the reasonableness of nihilism could turn on whether it is. In this spirit, for the remainder of the paper I will not appeal to liberalism in my defense of nihilism, but rather will assume the conservative view for the sake of argument. This gives nihilism the strongest possible defense (since the objections typically presuppose the conservative view), and it avoids the risk of overinflating the significance to epistemology of metasemantics.

5. The perceptual argument

A further objection to nihilism is that we have perceptual evidence for the existence of composite things like tables and chairs: we see, hear, smell, touch, and taste them.

A natural first reply is that our perceptual experiences would be exactly as they are in fact, whether or not composites existed.²¹ Perceptual experiences are determined by interactions between subatomic particles (those in our sensory apparatus, the perceived object, and the environment); and these interactions are unaffected by whether the particles compose further entities.²² But this first reply is not decisive, since it might be argued that it's just a fact about justification that we're justified in believing our senses—and this despite the fact that “things would appear the same even if our senses were deceived”.

For example, according to James Pryor (2000), if it perceptually seems to me as if p , then I have an “immediate justification” for believing p —immediate in that the justification doesn't rest on any further evidence or justification. In particular, I needn't be able to independently rule out alternative hypotheses that are also consistent with my perceptual experiences, such as the hypothesis that I am a brain in a vat that is stimulated to have those experiences. So, it might be argued, seeming to see a table²³ immediately justifies believing that there is a table, even if one can't rule out the nihilistic hypothesis that the visual experience is caused by particles arranged tablewise rather than by a table. To be sure, this immediate justification for believing in the table might be outweighed by other evidence (such as philosophical arguments in favor of nihilism). But at least it provides *some* evidence against nihilism, according to the objector. (And, the objector might say, philosophical arguments are invariably weaker than evidence supplied by perception.)

Similar challenges to nihilism could be based on other putative sources of immediate justification. “Conservatism”, the view that we are entitled to carry on believing what we already believe, might fit into this mold. Indeed, putative Moorean justification could be regarded this way. But let us continue

²¹See, for example, Merricks (2001, pp. 8–9). Note that this claim might be false if the contents of perceptual experiences include singular propositions about particular external objects. For an overview of issues about the contents of perception, see Siegel (2005).

²²Even a dualist about consciousness can accept this since the states of subatomic particles can include the holding of irreducibly phenomenal relations.

²³Note that Pryor construes the contents of perception “thickly”, so that they include propositions about physical objects (and not sense-data, say); see (2000, pp. 538–9).

to focus on perception.

My response to the argument from perception against nihilism will be based on examples like the following. Suppose you are just learning of the scientific evidence for the modern atomic theory of matter. And suppose further that—and you know this—Eddington was right that the atomic theory implies that tables are not solid. You then walk into your kitchen and perceive a table as being solid (or you reflect on the fact that this is common sense, or that you have always believed it, or whatever). It would be closed-minded and irrational to say: “the atomic theory is wrong because the table looks solid!” Rather, to the extent that the scientific evidence for the atomic theory is strong, you should take that evidence to show that your perception of solidity is unreliable.

Further, the scientific evidence doesn’t merely *outweigh* the perceptual evidence in favor of solidity in the overall balance of reasons. Rather, the original perceptual evidence simply vanishes. A sign of this: if the scientific evidence only weakly favors the atomic theory, you still ought to (tentatively) believe the atomic theory. No matter how weak the scientific case is for the atomic theory, it surely cannot be overcome by the fact that the table looks solid.²⁴

This example does not conflict with the idea that perception is a source of immediate justification. It merely shows that the notion of immediate justification must be properly understood, so as to allow immediate justification to be capable of “vanishing” in a pretty strong way. Pryor himself says that the immediate justification delivered by perception is merely *prima facie*, and that *prima facie* justification can be “defeated or undermined by additional evidence” (2000, p. 534). Perhaps he would say that the evidence for the atomic theory is an undercutting defeater, in the sense of Pollock (1986), of the perceptual justification that the table is solid. For present purposes, it isn’t important exactly how the vanishing is conceptualized; what is important is that no matter how weak the scientific evidence gets, if it favors the atomic theory, that is what we should believe.

The conflict between perceiving a solid table and the atomic theory of matter is, I think, analogous to the conflict between perceiving composite

²⁴Could this be because sources of justification are lexically ordered, with scientific evidence outranking perceptual evidence? But “scientific evidence” is partially constituted by perceptual evidence; moreover, perceptual evidence is normally thought to be very strong. Further, even if the example is changed so that the scientific evidence in favor of the atomic theory is replaced with some other form of evidence—testimonial evidence, say—it still seems that the evidence, however weak, would not be overcome by the perception of solidity.

objects and nihilism. To anyone who understands the challenge of nihilism and takes it seriously, any prior perceptual justification in favor of tables vanishes.²⁵ Arguing against nihilism on the basis of perception is no better than arguing that the atomic theory of matter must be false because tables look solid. To bolster this case, consider some further examples:

- You look into the nighttime sky and seem to see a twinkling star. Later you learn from astronomers that there is evidence that the star has gone nova; the twinkling is no longer occurring. Despite this, the visual belief that the star is now twinkling continues to impress itself on you. Clearly this visual belief gives you no reason—not even an outweighed reason—to reject the evidence from the astronomers.
- You perceive two events as standing in a relation of simultaneity: the proposition that they are simultaneous is immediately visually presented to you. This supplies no evidence—not even outweighed evidence—against the special theory of relativity. After one grasps the case for the special theory, there remains no lingering perceptual evidence that there is, after all, a relation of simultaneity.
- A racist seems to perceive The Other as inferior. It's not that he *infers* that they're inferior from the fact that they're Other. The belief that they're inferior rather forces itself on him immediately, as with more mundane perceptual beliefs. After a period of reflection and self-scrutiny, he gains evidence that his racism is unjustified. But his racist perceptual experiences persist. The reflection and self-scrutiny defeat his perceptual experience. And it isn't that the original justification for the racist belief (if there was any) lingers on, despite being outweighed. Its force simply vanishes.²⁶

These cases—and the case of the atomic theory of matter—are, I say, analogous to the case of nihilism. The important points of analogy seem to include (but may not be exhausted by) the following. In each case, a proposition is given in perception but conflicts with a theory. The theory is one that we're taking

²⁵Perception does not thereby become inert; it can still justify “neutral propositions”, such as the proposition that some things are arranged tablewise. See along these lines Field (1989, pp. 11–14).

²⁶Pryor's view is limited to what he calls *perceptually basic* beliefs. Someone might argue in this case (or even others) that the beliefs in question are not perceptually basic.

seriously—we aren't merely idly considering its possibility. The theory has some evidential support.²⁷ The theory provides a specific account of why perception is unreliable in the case at hand. In the cases other than that of nihilism, it is intuitively clear that any perceptual justification in the proposition vanishes, and is not merely outweighed by the evidence in favor of the theory. I conclude that the same is true in the case of nihilism as well.

I have been in effect arguing that evidence for nihilism defeats (and does not merely outweigh) any ordinary perceptual evidence in favor of composite objects. Now, Pryor says that although perceptual justification can be defeated by certain *ordinary* challenges, *skeptical* challenges don't defeat perceptual justification (p. 534). Suppose it appears to me that a computer screen is in front of me, but a skeptic points out that my experiences would be the same if I were a brain in a vat. In the face of this skeptical challenge, even though I have no independent reason for thinking that the vat scenario is not actual, I can, according to Pryor, continue to justifiably believe in what I perceive (hence his name for his position: dogmatism). Might it be argued that the nihilistic hypothesis is a skeptical challenge to perceptual beliefs in composites, not an ordinary challenge, and hence does not defeat perceptual justification in composites? There's no reason to think that Pryor intended the notion of a skeptical challenge to be understood in this way; but might this position be defended?

The nihilist's challenge differs from the skeptical one in that, intuitively, it is a real contender to be believed, whereas the brain in a vat hypothesis is a mere possibility—something that is hard to rule out but for which we have no positive evidence. It is hard to make this precise, but intuitively: by ordinary standards for evaluating evidence, nihilism is supported reasonably well by ordinary evidence (so long as that evidence is construed neutrally; but see the discussion of Williamson below), whereas the vat hypothesis is not; rather it is merely consistent with the (neutral) evidence. Nihilism gives a satisfying explanation—again, by ordinary standards—of our perceptual experiences; the vat hypothesis does not. There are positive arguments for nihilism, but not for the vat hypothesis.²⁸

But are these differences enough to rebut the idea that the nihilist's chal-

²⁷This is arguably inessential.

²⁸Compare Pryor: "I don't want to claim that you never have to rule out skeptical hypotheses... [Prima facie justification for perceptual beliefs] can be undermined or threatened if you gain *positive empirical evidence* that you really are in a skeptical scenario." (2000, pp. 537–8, my emphasis).

lenge is a skeptical one? The notion of a “skeptical challenge” is not a precise one, so it is hard to say anything definitive here. But perhaps the following bird’s-eye remarks constitute progress. There is a point to having a concept of justification that allows skeptical challenges to be summarily dismissed: namely, to avoid the stultification of inquiry. If explanation-givers needed to be able to answer the challenge posed by each and every alternate explanation, including the brain-in-the-vat “explanation”, then we would never get anywhere. But a concept allowing the nihilist to be dismissed in this way would also be stultifying. It would encourage tunnel-vision, limiting our attention to the familiar, and discouraging the consideration of radically new approaches to old problems. (Indeed, openness to unfamiliar viewpoints is part of what philosophy is most concerned to teach.) I don’t think our existing concept of justification is stultifying in this way, so I don’t think the nihilistic challenge can be dismissed in the way that the skeptical challenge can. But if this is wrong as a descriptive matter, then so much the worse for our existing concept of justification. We ought then to adopt a better concept that is more tolerant of challenges to the status quo.²⁹

Incidentally, the preceding discussion yields a defense against the following thought: philosophy is less secure than science and ordinary thinking—so much so that it couldn’t possibly overturn scientific or ordinary beliefs in composites. The defense is this: once the question of nihilism has been seriously engaged, it becomes an open question just what science and ordinary thinking deliver. Before nihilism was in question one might be forgiven for assuming that verdicts on whether tables and chairs exist are delivered. But once nihilism is in question, one can no longer assume this—to do so would be like continuing to assume that perception favors the solidity of tables once the atomic theory of matter is in question. One must instead treat what is secure in science and ordinary thought as being neutral propositions, such as the proposition that there exist things arranged tablewise.

6. Williamson

In chapter 6 of *The Philosophy of Philosophy*, Timothy Williamson addresses the question of what our evidence is, when we ask philosophical questions. This is relevant to our discussion since nihilism would be refuted if the evidence

²⁹Someone who regarded epistemic justification as metaphysically fundamental might feel less free to so cavalierly consider changing our existing concept.

we must accommodate in philosophy included everyday propositions such as the proposition that there are tables. Williamson's discussion is compelling; and it is clear that his sympathies do not lie with radical philosophical views like nihilism. But in the end, Williamson's arguments do not refute nihilism, since a nihilist can consistently (and, I think, should) embrace Williamson's conclusions.

One of Williamson's central aims is to oppose the psychologizing of philosophy. The following trend, Williamson argues, is common but misguided. A radical philosophical position like nihilism is under discussion. In an attempt not to "beg questions", only "neutral" evidence is admitted. Propositions such as that there are tables are not neutral (since they summarily rule against nihilism); so philosophers turn instead to certain propositions about mental states, such as the proposition that there appear to be tables. And in addition to psychologizing the evidence, some philosophers go further and psychologize the very question under discussion, construing it as being about language or concepts rather than the external world. Williamson argues that we should psychologize neither the evidence nor the subject matter. The question under discussion squarely concerns the external world: do there exist composite entities? And while psychologizing the evidence would protect nihilism from immediate refutation, it would also, Williamson argues, lead to skepticism.

Thomas Kelly (2008) bolsters Williamson's case here by appealing to a general requirement of total evidence: one ought to form beliefs based on *all* of one's evidence. Mundane examples show that forming conclusions based on only some of one's evidence leads to trouble; but if the requirement of total evidence is generally correct, then it remains so even in philosophy. Rather than following the "Cartesian" procedure of using only propositions meeting some higher, more rarified standard deemed more appropriate for philosophical questions, we ought always to utilize all of our evidence, even if the evidence concerns "dialectically inappropriate" propositions such as the proposition that there are tables. And as Williamson argues elsewhere (2000), every proposition one knows is part of one's evidence. So if objectors to nihilism, and uncommitted but interested bystanders, do indeed know that there are tables, then this becomes part of the evidence that their philosophical theories must accommodate, and for them, the case against nihilism is immediate and decisive.

A nihilist can and should agree with Williamson and Kelly that we should psychologize neither the evidence nor the subject matter, and that all known propositions should enter into the evidence used to decide philosophical questions. This threatens nihilism only if the objectors and bystanders do in fact

know that there are tables. But surely they do not. They know merely that some things are arranged tablewise.

Why think that the objectors and bystanders know that there are tables?³⁰ Williamson (2007, chapter 6) argues persuasively *against* one argument for the conclusion that they do *not* know this, namely, the argument that they cannot independently refute nihilism itself, a hypothesis inconsistent with the existence of tables. As Williamson points out, a claim to knowledge is not in general undermined by the inability to independently rule out all conflicting hypotheses; otherwise any claim to knowledge would be undermined by the inability to argue independently against the conflicting hypothesis that one is a brain in a vat. In general, Williamson draws on the many analogies between radical philosophical positions like nihilism, on the one hand, and skepticism on the other, to defend ordinary claims of knowledge from certain attacks.

This defense strikes me as being successful as far as it goes: the attacks on ordinary knowledge do not succeed if they are based on unrestricted general principles of the sort Williamson considers. But when one considers further analogies, and attacks on ordinary knowledge that are not based on unrestricted principles, the ordinary claims look far less secure. Knowledge may not require the ability to independently argue against *all* conflicting hypotheses; but

³⁰Kelly is curiously silent about this question. One possible explanation lies in the complex dialectical structure of his article. Kelly introduces a character he calls a “Moorean”, who argues against nihilism using the premise that there are tables. A nihilist would simply reject this premise; but Kelly’s primary aim is not to oppose this response. His aim is rather to oppose a character he calls the “Moderate”, who *believes* that nihilism is false but opposes the Moorean’s quick argument against nihilism. Given this dialectical structure, one expects Kelly’s moderate to be defined as merely believing, but not knowing (or thinking that she knows) that there are tables or that nihilism is false. However, Kelly’s article simultaneously discusses two positions: nihilism and skepticism. As a result he defines the Moderate as believing that both radical positions are wrong (albeit not opposable in the Moorean way). But since one of the positions is skepticism, the view that we do not know certain propositions—including the proposition that there are tables—he ends up defining the Moderate as believing that she knows that there are tables. (“...why shouldn’t we treat the fact that there are wooden tables as a good reason to reject those theories with which it is inconsistent? On the face of it, the Moderate would not seem to be in a strong position to resist the suggestion. After all, she too believes that there are wooden tables, and that we know that there are. (Again, contrast the apparently dialectically stronger position of someone who would deny these things on the basis of accepting some revisionary philosophical theory.)” (2008, p. 68)) But what about someone who believes but does not take herself to know that there are tables? (This person could oppose skepticism in the following sense: she thinks, against the skeptic, that she knows that there are electrons, that some things are arranged tablewise, and so forth.)

it surely requires the ability to independently argue against a great range of conflicting hypotheses. Pointing out certain alternatives that an opponent has not and cannot independently rule out is a paradigmatic, perfectly ordinary way of showing that one's opponent does not know. In a scientific context, for example, no one who is unable to rule out the explanation given by a legitimate scientific competitor could claim to know that her own theory is true. The procedure of undermining a claim to knowledge by pointing out certain unexcluded alternatives is utterly ordinary and commonplace. To be sure, one can know even without the ability to independently rule out all the conflicting claims of skeptics, cranks, and perhaps even nonskeptical, noncranky alternative hypotheses that one simply hasn't considered. But nihilism is not a skeptical hypothesis, it's not the claim of a crank, and here we are considering it. It's hard to know how to define "skeptical hypothesis" or "crank". But rather than tackling that difficult question, consider instead the analogies between the challenge that nihilism poses to ordinary claims to knowledge (such as the claim to know that there are tables), on the one hand, and perfectly ordinary, nonskeptical challenges to knowledge like the example of the unexcluded alternative scientific theory just mentioned. Or consider again the analogy between nihilism and the challenges to the status quo considered in the previous section (the atomic theory of matter, the twinkling star, the perception of simultaneity, and the racist).

Or better, consider the even closer analogy between nihilism and certain challenges to the status quo presented by physicists and philosophers of physics. One example is like the example of simultaneity considered earlier. According to the special theory of relativity, on its Minkowskian conception anyway, physical reality consists of matter in four-dimensional space-time, rather than consisting of matter in three-dimensional space as we used to think. It would have been inappropriate for a turn-of-the-century curmudgeon to object to Einstein and Minkowski by claiming that her evidence includes the proposition that two finger-snaps are objectively simultaneous. Moreover, surely the curmudgeon did not know that proposition. This is not merely because Einstein and Minkowski were right. For imagine that they were in fact wrong; there is such a thing as objective simultaneity. Still, assuming the curmudgeon understood what Einstein and Minkowski were saying, she surely did not know that the finger-snaps were objectively simultaneous. For a second example, consider "configuration space realism", an important theory about the foundations of quantum mechanics according to which reality ultimately unfolds, not in a space of three or four dimensions, but rather in the massively

dimensional configuration space of quantum mechanics, where that space is conceived not as an abstract mathematical formalism but rather as the concrete space of reality.³¹ This view is perhaps more threatening to ordinary beliefs about physical objects than nihilism is, for no part of configuration space can be straightforwardly identified with ordinary three- or four-dimensional space or spacetime. Yet it seems clear that the view cannot be refuted simply by appeal to the existence of ordinary three- or four-dimensional things. Once the view has been taken seriously, we no longer know that such things exist.

Intuitively, nihilism's challenge to the status quo is like the challenges in these examples, which cannot be answered by citing the status quo as evidence, and which are not like the challenges posed by skeptics and cranks. Although Williamson is himself opposed to nihilism and other radical philosophical views, it is not clear how deeply he would be opposed to this conclusion. He ends his discussion of these issues by saying:

None of the foregoing arguments provides any guarantee that judgment skepticism [a rubric under which nihilism falls] is not correct for some types of judgment; "common sense" is sometimes wrong. But if it is accepted in such cases, that should be on the basis of evidence specific to those types of judgment, not on the basis of general skeptical fallacies."

Nihilists should applaud this sentiment, but should argue that considerations specific to the case at hand, not general skeptical fallacies, show that objectors and bystanders do not know that there are tables.

There is another argument against nihilism that can be based on Williamson's views about evidence. We noted above Williamson's claim that every proposition one knows is part of one's evidence. Williamson (2000) also accepts the converse: all evidence must be known. Since 'knows' is factive, it follows that evidence must be true. But given nihilism, one might think, most if not all of our perceptual beliefs are false.³² So nihilism implies that we have little if any perceptual evidence.

Now, nihilism allows certain cautious beliefs to be true:

It seems as if there is a table.

It looks like *this*.

It's similar to how it was *then*

Some things are arranged tablewise

³¹See Albert (1996); Dorr (2009); Ney (2012); North (2012).

³²As above, this assumes a thick conception of the contents of perceptual beliefs.

And some people might form such beliefs, more or less immediately, on the basis of perception. But consider a nonphilosopher who has never thought about nihilism. (Analogous issues are raised by a philosopher who wholeheartedly opposes nihilism.) Such a person might never form any of the cautious perceptual beliefs. All of his perceptual beliefs would be in propositions about composite objects, and so would not constitute evidence for him. Now, nearly all of the empirical beliefs of such a person, and not just his perceptual beliefs, will be false according to nihilism; thus it is no (further) objection that nihilism implies that he has almost no empirical knowledge. But if he has no perceptual evidence at all, then it would seem that none of his empirical beliefs are even justified. And that conclusion is hard to swallow. However, even if his perceptual beliefs are not true, they could be *correct* (in the sense of section 3), and “safely” so (see Williamson (2000) on safety), and thus could count as something analogous to knowledge, and thus could count as something analogous to evidence—“quasi-evidence”, let us say. Quasi-evidence is to evidence as correctness is to truth: quasi-evidence is a substitute for evidence in a reconstruction of our epistemic lives, much as correctness was claimed in section 3 to be an adequate substitute for truth. Since nihilism allows a rich array of quasi-evidence to be available to the nonphilosopher, it allows him to be justified (or quasi-justified, if you like) in believing a wide range of empirical propositions.

7. The Cartesian argument

A further argument for the existence of composites appeals to the Cartesian premise that each person can be certain of her or her own existence. When combined with the further (and much less Cartesian!) premise that people are not partless entities, this leads to the rejection of nihilism.

The alleged certainty must be of our *fundamental* existence if it’s to be relevant to nihilism. For what is under dispute is the nature of the fundamental reality that underlies the correctness (or truth, given metasemantic liberalism) of the ordinary statement that one exists—whether this reality is metaphysically singular or metaphysically plural, so to speak. Given this, it’s hard to see why we would be entitled to the certainty, any more than we would be entitled to certainty about our fundamental physical makeup—to certainty, for example, about whether this or that quantum theory of our bodies is correct. (The source of the certainty might be argued to be Moorean or perceptual in nature; but these have already been considered.)

Perhaps another line of thought can be obtained from van Inwagen (1990, chapter 12): the source of the certainty lies in the nature of mentality. While the correctness (or truth) of ‘there is a table’, ‘there is a hydrogen atom’, and so on, demand nothing more than appropriately arranged particles, the correctness (or truth) of ‘I am thinking’ demands more. It demands—though here I am putting words in van Inwagen’s mouth since he does not speak of fundamentality—that there be, in the fundamental sense, a thinker that is me. Mentality is metaphysically singular.

But why think this? What is wrong with saying that the correctness (or truth) of ‘I think’ is ultimately due to arrangements of particles?

It’s not enough to emphasize how certain we are of this, or the immediacy of our awareness of it. The arrangement of particles constituting its correctness (or truth) might be one that is especially immediate, both epistemically and psychologically.

Rejecting materialism about the mind would not support metaphysical singularity. Irreducible or nonsupervenient mentality could consist of irreducible or nonsupervenient mental relations which relate many subatomic particles, rather than irreducible or nonsupervenient mental properties that are instantiated by single entities.

Perhaps van Inwagen’s belief in metaphysical singularity has something to do with the character of conscious experience? A subject’s simultaneous experiences are experienced by that subject as being in some sense part of *one* conscious episode, and as experienced by a single subject. But it is unclear why these aspects of phenomenology could not be due, metaphysically, to appropriate states (whether physical or nonphysical) of particles.

8. The deflationary argument

I have been presupposing that our topic is a substantive one: that the dispute over nihilism concerns the objective nature of the world, rather than being merely verbal or conceptual or notational. But some would deny this. Certain “ontological deflationists” claim that ontological disputes quite generally are in some sense nonsubstantive.³³ In the present context, an ontological deflationist might even claim that nihilism is conceptually incoherent, on the grounds

³³Writings in this ballpark include Carnap (1950); Chalmers (2009); Hirsch (2002*a,b*, 2005, 2007, 2009); Putnam (1975, 1987); Thomasson (2007, 2009).

that it's a conceptual truth that composites exist if subatomic particles are appropriately arranged.

Ontological deflationism challenges all philosophical ontology, not just nihilism. If it's a conceptual truth that composites exist if subatomic particles are appropriately arranged, then it's presumably also a conceptual truth that holes exist if objects are perforated, that propositions exist if sentences are synonymous, that directions exist if lines are parallel, and so on. But then it's incoherent to deny the existence of holes while accepting perforated objects, to deny the existence of propositions while accepting synonymous sentences, to deny the existence of directions while accepting parallel lines, and so on. The practice of ontology presupposes the coherence of such denials, and so is quite generally undermined by ontological deflationism. A full discussion of this issue would take us too far afield and would repeat what has been said elsewhere.³⁴ But in brief: my reply to the deflationist is that even if sentences like "composites exist if subatomic particles are appropriately arranged" are conceptual truths of *ordinary* languages, they're not conceptual truths of the ontologist's fundamental language. And so, since nihilism is formulated in a fundamental language, it is not conceptually incoherent.

9. Gunk

An object is "gunky" iff each of its parts (including itself) has proper parts. Since nihilists eliminate 'part' from their fundamental ideology, they must obviously reject talk of gunk in a fundamental language. But then they must also reject talk of gunk in *non*fundamental languages. For talk of composite objects in nonfundamental languages rests on fundamental talk about subatomic particles; recall how the minions were taught to speak of hydrogen atoms when protons are bound to electrons. The rules given to the minions make no provision for talking about proper parts "all the way down".

Nihilism precludes gunk; but is there any reason to think that gunk exists? Actually, there may be. Frank Arntzenius (2008) has recently pointed out that postulating gunk lets us avoid making certain distinctions to which the laws of nature are insensitive, for example the distinction between open and closed regions of space. (Arntzenius doesn't regard this as a decisive case for gunk, but rather as a reason to pursue a certain formal project, namely, that of seeing whether gunky spacetime can be developed in a way that supports quantitative

³⁴Dorr (2005); Eklund (2007, 2009); Hawthorne (2006, 2009); Sider (2009, 2011, chapter 8).

physical theories.) I have no particular response to this argument, except to say that the added complexity of countenancing a fundamental part-whole relation must be weighed against the benefit Arntzenius adduces, and moreover, that the attraction of the gunk-based theory will depend in part on the simplicity of its ideology and also on how simply the laws of nature may be formulated in terms of that ideology. So my case for nihilism must be tentative at this stage.

There is a second argument one might offer in favor of gunk, but ultimately it is unpersuasive. This is an inductive argument that there are no smallest particles. Historically, the following pattern has been repeated several times: a type of particle was discovered; the particles were first thought to be simple; but then it was learned that the particles are in fact made up of smaller particles. Physicists first posited molecules as the ultimate particles, but molecules gave way to atoms, which gave way to protons, neutrons and electrons, which have given way to quarks, leptons, and gauge bosons. Each time a new type of particle was discovered, physicists posited new features of the newly discovered particles, whose distribution accounted for, but could not be accounted for in terms of, the distribution of the distinctive features of the older, larger particles. This historical progression of theories will probably continue forever, the argument continues, so there are no ultimate particles on whose features everything depends. But this argument is bad, for a number of reasons.

First, induction from four cases is unimpressive. Second, the argument at best shows that there are no smallest bearers of physical magnitudes; but there might yet be smallest things. Third, by moving from initial “finite” observations to an “infinite” conclusion, the argument makes a big leap. Compare it to the argument that there must be infinitely many people, since for each person we’ve observed, there exists a taller person.³⁵ Fourth, the argument assumes a particle ontology. I have been writing as if a particle ontology were indeed correct; but a better approach, I think, rejects particles in favor of points of spacetime (or points of some higher-order space such as configuration space). Spacetime (or some higher-order space) must be posited regardless in order to support fields. But then the particles are gratuitous; and moreover one would need additional ideology, such as the predicate ‘particle x is located at point p ’, to connect the particles to spacetime. (Though I believe this supersubstantialist view to be correct, I’ll go back to writing as if what exists fundamentally are subatomic particles.)

There is also a fifth and subtler problem, though it depends on dropping

³⁵Thanks to Jason Turner and Cian Dorr for these last two points.

my stance of neutrality on the nature of fundamentality. Assume that i) we can speak of the fundamentality of features (such as the property of having unit negative charge), and that ii) fundamentality is all-or-nothing, rather than a matter of degree. The historical progression of physical theories that is cited by the inductive argument may then be formulated as follows:

Theory 1: The fundamental features are those of molecules

Theory 2: The fundamental features are not those of molecules, but are rather those of atoms

Theory 3: The fundamental features are not those of atoms, but are rather those of protons, neutrons, and electrons

Theory 4: The fundamental features are not those of protons, neutrons, and electrons, but are rather those of quarks, leptons, and gauge bosons

These theories, notice, concern which features are fundamental, and not just the existence of composite entities. (It might be objected that the inductive argument could ignore the facts about fundamentality and consider merely a progression of theories about the existence of composite entities; but it is bad inductive practice to draw conclusions based on arbitrarily selected subsets of one's evidence.) Now, we are asked to inductively draw a certain conclusion from the fact that scientists have been led to accept, and then subsequently reject, Theories 1–4. But what conclusion?

Two possibilities suggest themselves:

Conclusion 1: it's parts all the way down, but there is some mereological level at which all the fundamental features reside. The features of all other objects (including objects at mereologically smaller levels) depend on these fundamental features.

Conclusion 2: it's parts all the way down, and there is no such level. For every mereological level, mereologically smaller parts have distinctive fundamental features.

But *neither* conclusion is inductively suggested by the initial pattern.

Conclusion 1's postulation of smaller objects beyond the level on which everything depends is gratuitous, so it's hard to see why it would be inductively suggested.

Conclusion 2 is a very bizarre hypothesis (a kind of infinite ideological complexity). And it isn't inductively suggested by the initial pattern. Conclusion 2 might seem at first to be suggested because it has the superficial appearance of a kind of limit point of the initial pattern, if that pattern were infinitely extended. By moving through Theories 1-4, so the idea goes, scientists have been moving closer and closer to Conclusion 2. But this impression vanishes upon closer inspection. Each Theory in the progression does not *add* a new layer of fundamental features, but rather *ditches* the previous Theory's layer (since it regards the previous layer as just depending on the newly hypothesized layer). Extending the pattern indefinitely results in a series that simply has no intuitive limit. For comparison, imagine a countably infinite series of chairs: c_1, c_2, \dots . Suppose first that in scenario 1, c_1 is filled; in scenario 2, chairs c_1 and c_2 are each filled; in scenario 3, chairs c_1, c_2 , and c_3 are each filled; and so on. I suppose there's some sense in which the limit of this series is a scenario in which all the chairs are filled. But consider a second series in which only c_1 is filled in scenario 1, *only* c_2 is filled in scenario 2, *only* c_3 is filled in scenario 3, and so on. This series has no intuitive infinite limit. The imagined infinite extension of the progression through Theories 1-4 is like the second series.

The assumption of all-or-nothing fundamentality is crucial to this criticism. If fundamentality came in degrees we could redescribe Theories 1-4 as follows:

Theory 1a: Molecules have certain distinctive features

Theory 2a: Atoms have certain distinctive features, which are *more fundamental than* those of molecules

Theory 3a: Protons, neutrons, and electrons have certain distinctive features, which are more fundamental than those of atoms

Theory 4a: Quarks, leptons, and gauge bosons have certain distinctive features, which are more fundamental than those of protons, neutrons, and electrons

If continued infinitely, this progression *does* seem to have an infinite limit, namely:

Conclusion 3: it's parts all the way down, and for every mereological level, mereologically smaller parts have distinctive features that are *more fundamental than* the features of the previous level

A full discussion here would require delving into difficult questions about the nature of fundamentality. Here I'll make just two brief points. First, there are reasons to reject comparative fundamentality, as I argue in Sider (2011, chapter 7). Second, the friends of comparative fundamentality are likely to argue that comparative fundamentality must be well-founded; it cannot be that for each feature there is a more fundamental feature. (This stance does not on its own rule out gunk. Gunk is infinite descent in the part-whole relation; the stance rules out infinite descent in the fundamentality-over-features relation.³⁶) Given well-foundedness, Conclusion 3 is guaranteed, on independent grounds, to be false.

10. Possible gunk

So with the possible exception of Arntzenius's argument, I don't think there are good arguments that gunk is actual. But the alleged *possibility* of gunk is sometimes thought to threaten nihilism.³⁷

Gunk is, I suppose, epistemically possible. Maybe scientists will one day tell us that there is gunk after all; I don't pretend to know that this won't happen. But the defender of nihilism can happily grant that nihilism itself is epistemically possibly false. Substantive metaphysics is not a search for epistemic first principles, compatible with each and every epistemic eventuality; it can be held hostage to empirical fortune. This is the price a metaphysician pays for regarding her speculations as substantive hypotheses about the real world. Give me solid evidence for gunk, and I'll reduce my degree of belief in nihilism accordingly.

An apparently more serious threat comes from the alleged "metaphysical" possibility of gunk. Since gunk is metaphysically (take this as read henceforth) possible, nihilism is not necessarily true. But nihilism is a "proposition of metaphysics"; and such propositions are noncontingent; they are necessarily true if true and necessarily false if false. So nihilism isn't true.³⁸ I have no clear definition of 'proposition of metaphysics', but I have in mind propositions about abstract and general questions that metaphysicians debate, such as "numbers

³⁶If one construed fundamentality as applying to *facts* rather than features, then the assumption that relative fundamentality is well-founded might prohibit gunk on its own. See Sider (2011, section 7.7).

³⁷See, I'm afraid, Sider (1993).

³⁸The alleged possibility of emergent properties raises some of the same issues, as well as the issues of section 11. Compare the argument of McDaniel (2008).

exist”, “any charged object instantiates the property of being charged”, “time is like space”, and so on.

The argument from the possibility of gunk faces a challenge. Consider this argument for the opposite conclusion: “nihilism is possibly true; nihilism is a proposition of metaphysics and hence is noncontingent; so nihilism is necessarily true; so nihilism is true”. This argument assumes the possibility of nihilism and concludes that nihilism is true; the previous paragraph’s argument assumes the possibility of gunk and concludes that nihilism is false. Anyone who wants to defend the previous paragraph’s argument needs an asymmetry between gunk and nihilism, a reason to think that gunk is genuinely possible but nihilism is not.³⁹ But I won’t press this point, since in my view the argument fails for a more basic reason. All such arguments from possibility are undermined by what I believe to be the correct metaphysics of modality: modal “Humeanism”.⁴⁰

The Humean theory assumes that necessity and other modal notions are not fundamental. It further gives the following reduction of necessity: to be a necessary proposition is to be a proposition that is i) true, and ii) of an appropriate type, where the appropriate types are given by a list that I will specify in a moment. More carefully, to be necessary is to be a logical consequence of the propositions of the types on the list. For example, one of the types on the list is the type *mathematical proposition* (i.e., proposition purely about mathematics); thus, the necessity of the proposition that $2 + 2 = 4$ involves nothing more than the fact that i) two plus two in fact equals four, and ii) the proposition that $2 + 2 = 4$ is a mathematical proposition.

What types of propositions go on the list? The list is given by our use of ‘necessary’; nothing metaphysically deep unifies it. (Thus the Humean theory is in a sense deflationary: it says that there is much less to modality than meets the eye.) Given the way ‘necessarily’ is typically used by philosophers—in the sense of metaphysical necessity anyway—the list clearly includes at least these types:

1. propositions expressed by analytically true sentences
2. propositions of mathematics
3. “natural kind” propositions (such as: *all water is made of H₂O*)

³⁹Our “intuition” of possibility might be claimed to be stronger in the case of gunk. Alternatively, the possibility of nihilism might be rejected on the grounds that it clashes with the principle of universal composition, a principle that may be alleged to flow from the very nature of the part-whole relation (see Sider (2007b)).

⁴⁰See Sider (2011, chapter 11) for a fuller and more careful presentation.

4. propositions of metaphysics

Consider, now, type 4: propositions of metaphysics. (Similar remarks apply to types 2 and 3.) The inclusion of this type on the list corresponds to the dogma mentioned above: that the metaphysical is a noncontingent subject matter.⁴¹ The truth of this dogma is a shallow matter, according to the Humean; it is simply the result of our decision to mean by ‘necessary’ a property of true propositions given by a list including the type *proposition of metaphysics*.⁴² (This is not to say, where M is a metaphysical proposition, that M itself, or the proposition that M is necessarily true, is *about* that linguistic decision, or that its truth is counterfactually dependent on the decision.)

I won’t try to defend the Humean theory here, except to say that it seems to me the most promising form of modal reductionism. The leading alternatives are Lewisian modal realism and conventionalism. But modal realism is very hard to believe, and conventionalism requires the discredited notion of truth by convention.⁴³

Assume for the sake of argument that the Humean theory is true. The problem for the argument from the possibility of gunk is then intuitively the following (I will lay out the argument more carefully in a moment). Given the Humean theory, to be necessary is to be true and to fall under a type on the list. But *proposition of metaphysics* is one of the types on the list. So for a proposition of metaphysics such as nihilism, necessity just boils down to truth. But then, the only way to support the claim that nihilism isn’t necessary is to argue directly that nihilism is false, in which case the argument from possibility plays no distinctive role.

No one argues from possibility for mathematical propositions; no one tries to argue against Goldbach’s conjecture by asserting its possible falsity and then citing the noncontingency of mathematics. Perhaps this is because we realize that in mathematics there is no distance between truth and necessity, and so there is no hope of supporting the possible falsity of Goldbach’s conjecture, short of directly supporting its falsity. At any rate, this is the situation that I think obtains for metaphysical propositions as well.

⁴¹There are some dissenters. For example, Cameron (2007) holds that it’s contingent whether mereological composition is unrestricted. On my view, the list of types of propositions can vary with the speaker’s context; Cameron’s statement is true in a somewhat nonstandard but still linguistically allowable context, namely, one in which the kind *proposition of metaphysics* is dropped from the list.

⁴²And also that this type is closed under negation.

⁴³See Sider (2003).

More carefully. The objector's premise is that gunk is possible; or, equivalently, that (mereological) *atomism* is not necessary. Now, consider the dialectical situation in which the objector and the nihilist both accept the Humean theory of modality. It is then common ground between them that what it is for the objector's premise to be true is for the following to be true:

- (P) atomism is not a logical consequence of any true propositions that fall under one or more of the kinds on the list

What I will argue is that there is no distinctively modal way for the objector to support (P). Only by arguing directly that atomism (or some related proposition) is *actually* false can she support (P). But if she could do that, she would have no need for the argument from possibility, since she could argue directly from the actual falsity of atomism to the falsity of nihilism. The argument from possibility is superfluous.

The point is clearest if atomism is itself a metaphysical proposition. In that case atomism itself falls under a kind on the list, in which case it's hard to see how (P) could be supported other than by directly arguing that atomism is false. (If atomism is true then atomism would be a true proposition that falls under a kind on the list, and which implies atomism.) And if we had a direct reason for thinking that atomism is (actually) false, that would on its own give us a reason to reject nihilism, without the help of modal considerations.

The situation is a little more complex if atomism isn't a metaphysical proposition.⁴⁴ To reduce complexity, let me make a few assumptions, which I'll take to be common ground between the nihilist and the objector. First, this discussion is being conducted in a nonfundamental language (so that talk of parts is dialectically appropriate). Second, this language contains the means to state nihilism (recall that nihilism is a thesis about what is fundamentally the case). And third, if nihilism is true then the following conditional is analytically true: "if nihilism is true then atomism is true". (Recall the point from the beginning of section 9: if nihilism is true then nonfundamental talk of composites is governed by rules of use that rest all talk of parts on talk of simple subatomic particles.) Given these assumptions, the only way to support (P) would seem to be by directly arguing that atomism is false. For both sides agree that if nihilism is true then both nihilism and the proposition expressed by "if nihilism is true then atomism is true" are each of them true propositions that fall under some kind on the list.

⁴⁴Not that anything deep is at stake in the question of whether atomism is a metaphysical proposition; the notion of a metaphysical proposition is vague and not particularly fundamental.

Return to the first, simpler, case in which atomism itself is assumed to be a metaphysical proposition. I claimed that the only way to support (P) in this case is by directly arguing that atomism is false. My claim here is not based solely on the fact that if atomism is true then (P) is false, or even that it's common ground in the dialectical situation that this is so. (It's generally the case that when someone presents a valid argument for a conclusion, it's common ground that if its premises are true then its conclusion is as well; it doesn't follow that the only way to support the premises is through a direct argument for the conclusion.) It is rather based on inspection of (P). All (P) says is that atomism isn't a consequence of a certain class of propositions, a class that is simply defined as the class of all true propositions of a certain type *T*; and atomism is admitted by all hands to be of type *T*. Compare (P) to the claim:

The number 2 is not identical to any member of the set, *A*, of Ted's favorite numbers that are even

It's hard to see how one could support this claim without directly arguing that 2 isn't one of Ted's favorite numbers; similarly, it's hard to see how the objector could support (P) without arguing directly that atomism is false.

How else could the objector support (P)? What reason could the objector offer for thinking that atomism is not a logical consequence of any true propositions falling under some kind on the list? I suppose the objector might claim that her belief that atomism is not necessary is such a reason (since for atomism to fail to be necessary is precisely for it to fail to be a logical consequence of these propositions), thereby reversing what I claim to be the proper way of forming beliefs about (P) and the claim that atomism is not necessary. Relatedly, someone might criticize the way I recast the question of whether atomism is non-necessary as the question of whether (P) is true. The Humean theory of modality says that what it is for atomism to not be necessary is for (P) to be true; but, the critic might point out, epistemic features do not in general transmit across "what it is to be *F* is to be *G*". Thus the mere truth of the Humean theory does not imply that the only way to support the claim that atomism is not necessary is to support (P). To be fair, I began by assuming that the Humean theory is "common ground" between the nihilist and the objector, and not merely that it is true. But, it might be objected, even if one believes a metaphysical analysis, it does not follow that one's attitudes towards the analysandum are equivalent to one's attitudes towards the analysans. (*Perhaps*

this follows if one *knows* the analysis; but surely no one knows the truth of the Humean theory of modality.)

These concerns are serious, but ultimately not compelling: a rational approach to modal argumentation surely should be informed by reasonable beliefs about the underlying nature of modality. Suppose that initially, before you consider the question of the nature of modality, you believe that atomism is not necessary. Suppose further that this belief is not based on any direct reason for thinking that atomism is false; hence you do not believe (P), and you do not take yourself to have any reason to believe (P). But now, suppose you later come to believe the Humean view, and hence that *what it is* for atomism to not be necessary is just for (P) to be the case. Unless your reasons for coming to believe the Humean view somehow give you reason to believe (P) (and how could they?), you should surely then abandon your former belief that atomism isn't necessary. Insofar as your belief in the Humean theory is tentative, the abandonment should be tentative; but the stronger you reasonably believe the Humean theory, the stronger the abandonment ought to be.⁴⁵

Taking a step back: given the Humean theory, conceivability is no guide to possibility when it comes to metaphysical propositions. For as we have seen, for metaphysical propositions, necessity boils down to truth, and conceivability is no guide to the *truth* of metaphysical propositions. (Conceivability might yet be a guide to possibility for certain other types of propositions. Perhaps our ability to conceive of a proposition's being false is good evidence that it isn't expressed by any analytically true sentence; in that case, this ability would be good evidence for its not being necessary if we know that the proposition doesn't fall under any of the other types on the list.)

Taking a further step back: I believe that those who argue from possibility for metaphysical propositions typically make two presuppositions. First, modal facts are "further facts": the status of a true proposition as necessary or contingent involves the possession of some further fundamental feature, beyond the proposition's merely being the type of proposition that it is. And second, conceivability gives (defeasible) evidence for the presence of this further feature. Perhaps such arguments have weight, given these presuppositions. But given the Humean theory of modality, the presuppositions are mistaken—there is no

⁴⁵My argument here is what Mark Johnston (1997) calls an "argument from below"; it assumes that, in this case anyway, we should look to the underlying metaphysical nature of a proposition to decide what attitude to take toward that proposition. (Johnston criticizes certain other arguments from below.) Acceptance of my argument here does not require accepting all arguments from below.

such further feature.

11. Composites needed for spacetime physics

The final argument against nihilism that I want to consider is, I think, the most formidable one. Our best physical theories include a physical geometry—a theory of the intrinsic structure of physical space, time, or spacetime (or some higher-order space). But, it might be argued, physical geometries quantify over paths and regions, not just points; paths and regions are composite objects—mereological sums of points; and so, such theories must employ mereological vocabulary to describe paths and regions. Our best physical theories are our best guide to the correct fundamental ontology and ideology. So, mereological predicates are likely part of fundamental ideology, and composites are likely part of fundamental ontology.

It is common to divide geometric structure into different “levels”: topological, affine, metric. The need for paths and regions comes in (at least) at the topological and metric levels. Topologies, for instance, tend to appeal to a primitive notion of an open region; and “path-dependent” metric theories tend to appeal to primitive predicates of paths.

Some conceptions of geometry appeal only to predicates of points. In Tarski’s axiomatization of solid geometry, for example, the primitive predicates ‘between’ and ‘congruent’ relate only points (Tarski and Givant, 1999). But Tarski’s theory supplies both affine and metric structure, and thereby induces a topology, whereas the topological facts are often thought to be separate from the metric facts. More importantly, Tarski’s approach—which is designed to apply to flat spaces—takes metric facts to be direct connections between distant points, since such facts emerge from the holding of a primitive four-place congruence predicate (‘congruent(x, y, z, w)’ means that the distance from x to y is the same as the distance from z to w). But in the curved spacetimes of general relativity, the metrical facts are normally taken to be *path-dependent*. That is, the distance between two points is not taken to be a direct connection between those points, but is rather defined in terms of path-length: the distance between two points is the length of the shortest path connecting them. Thus, on this conception, the fundamental metric facts are facts about paths, not facts about points.⁴⁶

⁴⁶See Bricker (1993); Maudlin (1993, 1996).

Think of it this way: to do physical geometry we need a way to predicate features (openness, path-length) of infinitely many points at once. And a natural way to do this is to posit a “gathering entity”, a mereological sum composed of those points—a path or region—and then predicate the features of the sum.

But the gathering entity could be a set rather than a sum.⁴⁷ This is indeed my reply: the best conception of physical geometry is set-theoretic, not mereological. We should construe fundamental geometric features of paths and regions as being features of sets, not sums, of points. In topology, for instance, we can take ‘open’ as a predicate of sets. It’s of course commonplace to take ‘open set’ as the undefined expression in purely mathematical topology; but what I am recommending is taking ‘open’ as the *metaphysically fundamental* notion for *physical* topology—the topology of physical space.

My reason for preferring the set-theoretic conception of physical topology is that we need set-theory *anyway* in our fundamental theory of the world. And my reason for thinking the latter is just the familiar indispensability argument,⁴⁸ though I construe that argument as an argument for a set-theoretic fundamental ideology in addition to ontology. Assume as backdrop the ideology of first-order predicate logic, plus a primitive predicate for set-membership, \in , plus an ontology of sets. Set-theoretic topology then requires only a single added primitive predicate, namely ‘open’, whereas mereological topology also requires the predicate $<$ for parthood. The addition of $<$ would be gratuitous.

I won’t discuss the indispensability argument in any detail, but let me comment briefly on two issues. First, the present perspective on ideological parsimony is that ideologically simpler theories aren’t just more convenient for us. They’re more likely, other things being equal, to be true, just as ontologically leaner theories are more likely, other things being equal, to be true. So when evaluating competitors to a set-theoretic ontology and ideology, one must take into account the competitor’s ideology as well as its ontology. A modal structuralist such as Hellman (1989), for example, saves on the ontology of sets but requires a primitive ideology of modal operators and higher-order quantifiers. Relatedly, the structuralist mereological approach to set theory from the appendix of Lewis’s *Parts of Classes* requires a primitive ideology of primitive plural quantifiers. (However “ontologically innocent” plural quantifiers are, they’re not ideologically innocent.) Replacing \in by $<$ and the plural

⁴⁷One might propose to do away with gathering *entities* altogether, and take ‘open’ as an irreducibly plural predicate of points. This would require a primitive ideology of plural quantification. If sets are needed anyway for mathematics, the addition is gratuitous.

⁴⁸Putnam (1971); Quine (1951*b*, section 6) and (1960, chapter 7).

quantifiers seems, if anything, an ideological step backwards. (For what it's worth, additions to logical ideology such as the plural quantifiers seem particularly destructive of "simplicity".) The tradeoff between ontology and ideology is familiar; but once ideological commitments are regarded as "worldly", as contributing to the complexity of the world one is positing, then I believe that the simple ideology of (first-order) set theory makes it more attractive than its competitors.

Second, one of the biggest challenges to the indispensability argument is Hartry Field's program for nominalizing physics. In *Science without Numbers* Field shows how to reformulate certain portions of physics using an ideology consisting solely of that of first-order predicate logic, plus some physical predicates, plus the predicate $<$ for parthood.⁴⁹ If this program succeeds quite generally then we could *replace* \in with $<$ in our fundamental ideology for physical geometry, rather than adding $<$ to an ideology that already contains \in . My argument from ideological parsimony for nihilism would thus be undermined.

My defense of nihilism, therefore, is conditional on the outcome of the ongoing debate on Field's program. About this I have only the following to say. A prominent worry about Field's program is that it doesn't naturally extend to quantum mechanics and other theories that make heavier uses of set theory than the bits of physics that Field discusses in *Science without Numbers* (Malament, 1982). But this criticism could be answered by configuration-space realists, who, as we saw earlier, regard configuration space in quantum mechanics not as an abstract set-theoretic representation, but rather as a manifold of sui generis points.⁵⁰ Now, Malament argues that substantivalism about configuration space should offend nominalist scruples. But suppose that the source of nominalist scruples is opposition to the *ideology* of theories of abstracta (\in , in the case of sets). Then substantivalism about configuration space would not offend, since the needed ideology would just be mereological and geometrical.

⁴⁹Field does make use of a notion of logical modality in formulating the idea of conservativity, but not within the reformulated physics. (The point of bringing in conservativity is to justify the practice of using mathematics to draw out nominalistic conclusions from nominalistic premises.) It's an interesting question whether Field might insist that in his fundamental theory (if he's happy to talk this way), modal notions do not occur; they're only needed in his justification of the use of mathematics, and that part of his theory needn't be fundamental.

⁵⁰Dorr himself is (or was) a nihilist; as such he must think of distance and topology as somehow emerging from direct point-to-point relations. If such an approach were viable, and compatible with Field's program, then one could get by with *neither* $<$ nor \in , and the argument from ideological parsimony for nihilism would be reinstated. Dorr's (2011) most recent work on physical geometry (co-authored with Arntzenius), however, makes use of parthood.

Instead of challenging the indispensability argument, an objector might grant the existence of sets but resist the idea that the fundamental facts about physical geometry involve sets. Sets are *abstract* after all!

The abstract/concrete distinction behind this objection is a relic of a certain theory. According to this theory, reality divides into two realms—abstract and concrete—in a way that is significant on various fronts. Epistemic: we know about the abstract a priori. Modal: facts about the abstract are necessary. Causal: the abstract is causally inert. Spatial: abstract entities are not in space and time. But this is just a theory, nothing more. It's not sacrosanct; nothing supports it other than tradition; and it should stand aside if it obstructs an attractive simplification of ideology.⁵¹

If you don't like the idea of fundamental notions of physical geometry applying to sets, perhaps you're not really taking set theory seriously as a piece of metaphysics. But remember that this is exactly the idea: sets and \in are rock-bottom, just as the compositionalist regards composites and $<$ as being rock-bottom. Given this, what is worse about regarding openness and path-length as applying to sets rather than regions and paths?

Sometimes the threat of arbitrariness at the fundamental level stands in the way of regarding abstracta as being involved in fundamental facts. For example, someone who regarded distances as grounded in a fundamental function from pairs of points to real numbers would need to choose, it seems, a distinguished unit of measure. But this worry isn't present here; there's no arbitrariness in 'open set', or 'paths p_1 and p_2 are congruent'.

So: my (tentative, because conditional on the fate of Field's program) reply to this section's objection is that sums of spacetime points are not needed for physical geometry; sets of spacetime points will do just as well. Since I have accepted the existence of sets, I suppose I could now go back and respond differently than I did earlier to the Moorean, perceptual, Williamsonian, and Cartesian arguments against nihilism. For I can now identify ordinary objects—tables and chairs, planets and molecules, we ourselves—with sets, either of particles or points of spacetime. On this view, ordinary objects do exist in the fundamental sense after all. I'm not going to do this because I think that my earlier responses suffice even without an ontology of sets. Moreover, some of the earlier dialectic would still need to be replayed, for example in the face of

⁵¹Speaking for myself, I also doubt that the contrasts involved in the theory run very deep: modal notions are not fundamental; the a priori/aposteriori distinction is problematic; and reductionism about laws is true.

Moorean insistence that “I’m not a set, dammit!”

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