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Matthew McGrath ^a

^a University of Missouri-Columbia,

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NO OBJECTS, NO PROBLEM?

Matthew McGrath

One familiar form of argument for rejecting entities of a certain kind is that, by rejecting them, we avoid certain difficult problems associated with them. Such *problem-avoidance* arguments backfire if the problems cited survive the elimination of the rejected entities. In particular, we examine one way problems can survive: a question for the realist about which of a set of inconsistent statements is false may give way to an equally difficult question for the eliminativist about which of a set of inconsistent statements fail to be 'factual'. Much of the first half of the paper is devoted to explaining a notion of factuality that does not imply truth but still consists in 'getting the world right'. The second half of the paper is a case study. Some 'compositional nihilists' have argued that, by rejecting composite objects (and so by denying the composition ever takes place), we avoid the notorious puzzles of coincidence, for example, the statue/lump and the ship of Theseus puzzles. Using the apparatus developed in the first half of the paper, we explore the question of whether these puzzles survive the elimination of composite objects.

Introduction

Philosophers sometimes argue that by rejecting certain entities we avoid problems associated with them, and that this is a reason to reject the entities. Such *problem-avoidance* arguments are familiar from a wide variety of ontological debates. Nominalists cite the avoidance of epistemological and 'intrinsic nature' problems associated with abstract objects; materialists cite interaction and individuation problems for souls; compositional nihilists (who deny composition ever takes place) cite the puzzles of coincidence (the statue/lump, body-minus, etc.); and so on. Eliminativism about a certain kind of entity may have costs of its own, but if it enables one to avoid troubling problems associated with the rejected entities, then this is a significant point in its favour.

Depending on the kind of the problem involved, problem-avoidance arguments may take different forms. We may distinguish (at least) two kinds of problem. One involves conflict with a principle or statement of fact assumed by the eliminativist to be well-confirmed. Thus, the nominalist might argue that, on the supposition that there are abstract objects, certain well-confirmed epistemological principles would have to be false, and that this is a reason to reject abstract objects. The atheist might argue similarly, citing the well-confirmed fact *that there is evil*. Another kind of problem is a *puzzle* associated with the entities. The eliminativist about sense-data might

argue that, on the supposition of sense-data, puzzles arise over their persistence, their relations to how things appear, and so on; by rejecting them, we avoid these puzzles. The claim here is not that, given sense-data, such and such well-confirmed principle would have to be false, but rather that certain apparently insoluble puzzles arise. Problem-avoidance arguments that cite a puzzle we will call *puzzle-avoidance* arguments.

Problem-avoidance arguments sometimes backfire. This happens when rejecting the relevant entities either does not make the problem go away or raises a closely related and equally challenging problem. When a problem-avoidance argument backfires it fails as an argument, for it does not provide a good reason for rejecting the relevant entities. Related to the notion of backfire is the dialectical notion of being susceptible to a *tu quoque*: one is susceptible to a *tu quoque* against one's problem-avoidance argument if, given one's commitments, the problem one cites (or a closely related one) arises for one. *Tu quoque* susceptibility is sometimes easy to spot. For example, it clearly applies in the case of the class-nominalist who cites the non-spatiality of universals in a problem-avoidance argument against universals; one is right to ask: aren't classes non-spatial, too? Whether an argument backfires, though, is often a subtle and complex matter, for it may not be clear whether by rejecting the entities in question we can avoid the problem and its close relatives.

In the first part of this paper, we will examine one way puzzle-avoidance arguments can backfire. To put it a bit cryptically: a puzzle for the realist about which of an inconsistent set of sentences is false may survive for the eliminativist as a puzzle about which of those same sentences fails to be 'factual' in a sense that does not require truth but which in some sense has to do with 'getting the facts right'. Much of the first part of this paper attempts to elucidate this notion of factuality.

The second part of the paper is a kind of case study. It examines whether the compositional nihilist may successfully cite the puzzles of coincidence in an avoidance argument against composites, or whether any such attempt must backfire.

I. Eliminativism, Puzzle Avoidance, and Backfiring

A. Factuality

Eliminativism can be a double-edged sword. It may enable one to avoid problems associated with the rejected entities, but it also may seem to fly in the face of the facts. Eliminativists about *Ks* are familiar with retorts such 'you're telling me that such and such [an obviously true *K*-sentence] is false!' For example: *2 + 2 isn't 4! no proposition is true! there is nothing 'Aristotle' refers to!* and the compositional nihilist is familiar with the particularly scornful retort: *so, you and I don't exist!* When mocked in this way, the eliminativist has at least two options. She can argue that the relevant *K*-sentences do not really require the existence of *Ks* for their truth, but only appear to do so. This can be risky, for the sentences seem by their logical

form to entail ‘there are *Ks*’. Does the eliminativist about *Ks* accept ‘there are *Ks*’? If so, what makes her an eliminativist? If not, how can she accept something that entails ‘there are *Ks*’?¹ Another strategy, the one which we will focus on in this paper, is to claim that, even though the ‘obvious’ *K*-sentences may be false or at least untrue, they do succeed in capturing how the world is, in being *factual*. In the remainder of this section, we articulate a notion of factuality.² In the section following this one, we will see that factuality itself is potentially a double-edged sword for eliminativists.

We will build up to a notion of factuality in stages. We begin with the notion of aptness, or as we will say, truth given the relevant entities. Inaptness is falsity given the relevant entities. The atheist denies that ‘God loves us’ is true and accepts the truth of its negation. But she agrees that, given God, it is true rather than false, and so she is willing to call it apt and its negation inapt.

How should the conditional clause ‘given *Ks*’ be understood? Is it indicative or counterfactual? What matters most, for us, are certain features that the operator ‘given *Ks*, ...’ must have to function as it does in disputes about whether there are *Ks*. We list five such features. (These features will be crucial below.) One is that ‘given *Ks*, φ ’ and ‘there are *Ks*’ should together entail φ .³ This explains why the realist cannot legitimately reply to an argument against *Ks*, ‘granted, given *Ks*, something false follows. So what?’ The answer is: so you are committed to something false! A second feature is closure under logical entailment: if the φ_i s jointly logically entail ψ , then the corresponding sentences of the form ‘given *Ks*, φ_i ’ jointly entail ‘given *Ks*, ψ ’. An eliminativist may safely draw logical entailments within the scope of ‘given *Ks*’. (We construe logical entailment broadly enough to include conceptual entailment, but not so broadly as to include metaphysical entailment.) In the limiting case in which φ is entailed by everything, and so is a logical truth, ‘given *Ks*, φ ’ should be entailed by everything as well; and so should be a logical truth too.⁴ The eliminativist may safely assert logical truths with the scope of ‘given *Ks*’ without the need of premises. Third, whether ascriptions of logical entailment are themselves logically true or not, we want any such ascription to be true given *Ks*. The eliminativist needn’t watch what she says about what logically entails what within the scope of ‘given *Ks*’. (The same is not true, of course, for metaphysical entailment. The universals theorist will insist that ‘snow is white’ metaphysically entails ‘snow instantiates whiteness’ but the nominalist will obviously deny this.) Fourth, for any true topic-neutral semantic principle

¹This paper addresses eliminativism rather than anti-realism or irrealism. When I speak of ‘realists about *Ks*’, I am speaking of those who accept the existence of *Ks*. An anti-realist or irrealist might count as a realist in this sense (realist with respect to existence) but not as a realist in a more full-blooded sense (realist with respect to explanatory status). See Fine [2001].

²The notion of ‘factuality’ is not new with me. My thinking owes much to Sider [1999], Schiffer [2002], and Yablo [1998; 2002; ms], Yablo and Rayo [2001].

³Except where real confusion could result, I will use quotation marks where, to be strictly correct, I should use metalinguistic variables and Quinean corners. This saves the writer, the reader, and the copyeditor some headache.

⁴This may require qualification. Arguably, sentences containing a use of a *K*-name cannot have a truth-value unless there are *Ks*. A *K*-name is a name that refers to a *K* given *Ks* and which is empty unless there are *Ks*.

P, 'given Ks, P' should be true. Within the scope of 'given Ks', the eliminativist may assert:

$\lceil Ra_1 \dots a_n \rceil$ is true iff the referents of $a_1 \dots a_n$ jointly satisfy the n-place predicate R .

$\lceil \sim A \rceil$ is true iff A is not true.

$\lceil A \ \& \ B \rceil$ is true iff A and B are true.

$\lceil A \vee B \rceil$ is true iff either A or B is true.

$\lceil \exists x A \rceil$ is true iff something satisfies A .

In fact, every (non-pathological) instance of the T-schema ' p is true iff p —save those involving K -names—should also be true and so assertable within the scope of 'given Ks', and similarly for the satisfaction-schema $a_1 \dots a_n$ satisfy ' R ' iff $Ra_1 \dots a_n$.

If 'given Ks' has these features, then aptness has corresponding features: 'S is K -apt' and 'there are Ks' jointly entails 'S is true'; aptness is closed under logical entailment; logical truths are apt; ascriptions of logical entailments are apt; not just any old truth is apt, and topic-neutral semantic principles are apt. Note that these features do not insure that every sentence is either apt or inapt—that, for every S , either S is true given Ks or S is false given Ks. The most that follows is that S has a truth-value given Ks.⁵

One might worry that if nothing more is said about aptness, it will be hard to tell which sentences are apt. Consider 'red things share a universal in common'. Is this apt relative to the category *universal*? That is, is it true given universals? How this question should be answered depends on what sort of conception of universals is at issue. If Armstrong's conception is at issue, then the sentence is not apt; and in fact is inapt. If Chisholm's or some other platonic conception is at issue, it is apt. If only some minimal conception of universals common to Armstrong and Chisholm is at issue, it may not be clear what to say. The realist, who believes that there are entities fitting the minimal conception of a universal, is presumably committed to thinking that there is a fact of the matter: the sentence is either apt or inapt. However, the nominalist might well deny this, claiming either that the sentence lacks aptness status (is neither apt nor inapt), or that that its aptness status is indeterminate (it determinately is either apt or inapt, but it is neither determinately apt nor determinately inapt).

Of course, the realist may invite the eliminativist to consider Ks as she, the realist, is conceiving of them. Thus, if Armstrong is arguing with the nominalist, he might invite her to consider what is the case given Armstrongian universals. By enriching the relevant ontological category,

⁵Whether this follows depends on what we say about K -names in the absence of Ks. See the previous note. The reader might wonder how wide-ranging my use of ' K ' is intended to be. Does it include 'kinds' like *being a round square*? It does not. I intend ' K ' to range only over kinds discussed in standard ontological disputes. Such kinds, I am assuming, are not logically impossible.

the realist about *Ks* will force the eliminativist to classify more sentences as apt (inapt). The eliminativist will be quick to point out, however, that gains in aptness do not come on the cheap. Working with an enriched conception of *Ks* will mean taking a stronger position, and so one that exposes more flank to eliminativist attack.

We can see from this barebones account that aptness is not sufficient for factuality. I am happy to say that 'Zeus is the father of Athena' is apt, but I do not think that it captures the way things are. By contrast, even if you deny universals (properties, what you have), you will still want to say 'the sky instantiates the universal of blueness' is factual.

One aspect of factuality is not getting the facts wrong, or being factually sound. Suppose you are an eliminativist about *Ks*, and you concede that the apparent logical form of *K*-sentences is the real one. Because you reject 'there are *Ks*', you reject all sentences entailing it, all positive *K*-sentences. You may still ask yourself, of any given such sentence *S*: is *S* untrue merely because there are no *Ks*, or does *S* make unmet demands on the world of non-*Ks*? Compare 'the sky instantiates blueness' and 'the sky instantiates greenness' from the perspective of the nominalist. Even if not all of the demands the former makes are met (after all, it demands that the world contain a universal), all of its demands on the universals-free world are met. The same is not true of the latter. To use a phrase of Mark Balaguer's [1998], the eliminativist about *Ks* should grant that for some positive *K*-sentences *S*, although *S* is untrue, the world holds up its end of 'the *S* bargain'.

One might worry about our talk of a sentence's *demands*. The most natural way to define *demanding* is as a relation between sentences *A* demands *B* that holds iff *A* metaphysically entails *B*. Or in other words iff: for any metaphysically possible world *w*, if *A* is true when evaluated at *w*, then so is *B*.⁶ Many nominalists, however, believe that universals are metaphysically impossible. They would then be committed to the unfortunate claim that the world never holds up its end of the bargain for positive universals-sentences because those sentences demand *everything* of the world of non-universals. On the other hand, if we choose to define *demanding* more narrowly, say in terms of logical rather than metaphysical entailment, certain eliminativists will not see positive *K*-sentences as making any non-trivial demands on the *K*-free world. Presentists, for example, cannot plausibly claim that 'Sally admires Aristotle' logically entails the sort of complex facts that they wish to say are demanded of the world of present objects by this sentence (e.g., that Sally admires having such and such

⁶Questions about expressive limitations may be raised here. For example, any nominalist should recognize that 'John has a property' requires something of the world of non-properties. But it is hard to express what it is without using the apparatus of quantification over properties. The sentence doesn't seem to quasi-demand the infinite disjunction of sentences of the form 'John is *F*', where '*F*' is a one-place eternal predicate of English. Yablo and Rayo [2001], following Boolos [1984], suggest using second-order quantification explained in terms of plurals. Thus, 'John has a property' will quasi-demand 'there is an *F* such that John is *F*'.

We decline to invoke propositions for two reasons. First, we want the eliminativist about propositions to be in a position to accept the factuality of certain proposition-sentences. Second, arguably, *K*-eliminativists who accept propositions should not grant that sentences containing uses of *K*-names express propositions. The compositional nihilist will have difficulty agreeing that 'Bush is president' expresses a proposition. Nonetheless, she will want to call the sentence factual.

characteristics which she believes were possessed by such and such a person. . .). Nor can the (compositional) nihilist plausibly claim that ‘there are chairs’ logically entails much of anything about simples, even that *there are simples*.

The solution to the difficulty, I believe, is to retain the account of *demanding* in terms of metaphysical entailment but to introduce a notion of *quasi-demanding*, explained as follows:

For any sentences *A* and *B*:

A quasi-demands *B* (relative to *K*) iff: given *K*s, *A* demands *B* (i.e., iff ‘*A* demands *B*’ is *K*-apt).

The presentist can then say that ‘Sally admires Aristotle’ quasi-demands only *truths* about the world of present-entities (*mutatis mutandis* for the nihilist).⁷ This suggests the following definition of factual soundness:

Definition 1: *S* is *factually sound* (relative to *K*) iff: all of *S*’s *K*-free quasi-demands are met.

where a *K*-free sentence is one purporting to describe merely how things stand in the *K*-free world, or the world of non-*K*s. If *S* is not factually sound, it is factually unsound; it makes an unmet quasi-demand on the *K*-free world. (Side note: if a criterion is wanted for ‘*K*-free’, perhaps the following is a start. A sentence is *K*-free iff, after every definiendum in the sentence is replaced with its definiens and all implicit quantifier-restrictions are made explicit, the resulting sentence has the following properties: (i) it contains no *K*-names; (ii) all its quantifiers are explicitly restricted to non-*K*s; and (iii) the only occurrences of *K*-predicates⁸ it contains are those that figure in the explicit quantifier restriction to non-*K*s.)

Unfortunately, Definition 1 is too liberal. To look ahead to our discussion of nihilism, the sentence ‘there are winged horses’ ought to turn out factually unsound. However, it is not obvious that it quasi-demands any false *K*-free sentence. One might suggest that the sentence quasi-demands ‘there are simples arranged winged-horse-wise’. (Assume, for now, that this is composite-free.) But must a nihilist think that, given composites, it is *metaphysically necessary* that all composites are composed of simples? Why isn’t this merely contingent, given composites? Perhaps, given composites, there could have been gunk. (After all, many *realists* claim that, although there is no gunk, there could have been.) So, arguably, ‘there are winged horses’ does not quasi-demand ‘there are simples arranged winged-horse-wise’ but at best it demands a disjunction: ‘*either* there are simples arranged winged-horse-wise, *or* there is bottomless gunk arranged winged-horse-wise *or* ...’. Similarly, the ‘gunker’ who denies folk composites (tables, persons, etc.) will wish to say that ‘there are winged horses’ is factually unsound, but she should not claim that it

⁷My use of the ‘quasi-’ terminology borrows from Sider [1999].

⁸A *K*-predicate is a predicate that is either *K*-implying or is definable in terms of *K*-implying predicates. A predicate is *K*-implying iff it is that applies given *K*s and is empty unless there are *K*s.

quasi-demands ‘there is bottomless gunk arranged winged-horse-wise’. *Mutatis mutandis* for defenders of the ‘bundleless’ bundle theory, according to which there are no particulars, but only universals arranged in certain ways [Hawthorne and Sider 2002]. They arguably should concede that ‘there are winged horses’ does not quasi-demand ‘wingedness and horseness are compresent’, but at best some disjunction in which it figures.

The difficulty in question arises for eliminativists who deny *Ks* but accept certain *Xs* such that, given *Ks*, each and every *K* is contingently constituted by (i.e., composed by, a bundle of, ‘built out of’, etc.) *Xs*. To address this difficulty, we need the notion of quasi-demanding relative to a *constitution* principle for *Ks*, that is, relative to an apt principle of the form ‘every *K* is ultimately constituted by some *Fs*’, where ‘*F*’ is a sortal term for certain non-*Ks*.⁹ We assume that the eliminativist will select some particular constitution principle to serve as *the distinguished constitution principle* for *Ks*. The compositional nihilist will select ‘all composites are ultimately composed of simples’, the gunker who denies folk composites ‘all folk composites are ultimately composed of bottomless gunk’, and the bundleless bundle theorist ‘all particulars are ultimately constituted by universals’. Each of these theorists can then call ‘there are winged horses’ factually unsound, on the grounds that it quasi-demands something false of world, relative to the appropriate distinguished constitution principle.¹⁰ This suggests an improved definition for factual soundness:

Definition 2. *S* is *factually sound* (relative to *K*) iff: (i) all of *S*’s *K*-free quasi-demands are met, and (ii) if *K* has constitution principles, then every *K*-free quasi-demand *S* makes relative to the (distinguished) *K*-constitution principle is met.

Definition 2 is itself too liberal, as can be seen by considering sentences containing proper names. ‘Bush is a redhead’ should turn out factually unsound for the compositional nihilist. But does it quasi-demand any composite-free falsehood *simpliciter*, or relative to ‘all composites are ultimately composed of simples’? It is hard to see what this would be, other than the likes of ‘there are simples arranged redhead-wise’, which is true. One wants to say that the sentence requires something false *of the simples composing Bush*, namely that they are arranged redhead-wise. But that way of putting it presupposes the existence of Bush.

We need to relativize to *constitution sentences*. The compositional nihilist may say that, given composites, ‘Bush is a redhead’ demands ‘the *xs* are arranged redhead-wise’ relative to the constitution sentence ‘Bush is composed of the *xs*’. For each composite-name *N*, there will be an apt sentence of the form ‘*N* is composed of the *ys*’, where ‘the *ys*’ picks out some

⁹Strictly speaking, distinguished constitution principles should perhaps be taken to be the form ‘Every *K* is constituted by some *Fs* and is constituted by those *Fs* that in fact constitute it’. The second clause may sound like a trivial addition, but it simplifies the proof given in the Appendix.

¹⁰Relative quasi-demanding needn’t be taken as primitive. First, we may generalize the notion of demanding to that of joint demanding: the *As* jointly demand *B* iff, for every metaphysically possible world *w*, if all of the *As* are true when evaluated at *w*, then so is *B*. Second, we may take *A* to quasi-demand *B* relative to the *Cs* (relative to *K*) iff *A* and the *Cs* jointly quasi-demand *B* (relative to *K*).

simples.¹¹ Because composite-sentences may contain many proper names, the simplest approach is to relativize to the set of all constitution sentences for *K*-names, or in other words the set containing, for each *K*-name *N*, every constitution sentence for *N*. The gunker and the bundleless bundle theorist may appeal to analogous relativizations.

We thus arrive at a third and final definition:

Definition 3. *S* is *factually sound* (relative to *K*) iff: (i) all of *S*'s *K*-free quasi-demands are met, and (ii) if there is an apt constitution principle for *K*s, then every *K*-free quasi-demand that *S* makes—relative to the distinguished constitution principle for *K*s and the set of constitution sentences for *K*-names—is met.

For some *K*, the complicated clause (ii) will be vacuously satisfied. Most nominalists, for example, will deny that there is an apt constitution principle for universals.¹²

Factual soundness (relative to *K*) is a matter of *being in the clear* as far as the *K*-free world goes. If the only *K*-sentences you accept are factually sound, then you will not misrepresent the *K*-free world. This is clearly a necessary condition for factuality, though not a sufficient one. Perhaps the sentence '1 has a primitive intrinsic property that 2 lacks' and its negation are factually sound. Both are in the clear as far as the numbers-free world goes. But neither is appropriately tied down by that world, and so neither should count as factual. We need a notion of *factual grounding*, or the grounding of a sentence by how things stand in the *K*-free world. Of course, if this notion is to be of use to the eliminativist, we cannot understand it as consisting in being demanded by a *K*-free truth, because no *K*-free truth demands anything untrue. We must appeal again to quasi-demands. Neglecting relativity to constitution principles and constitution sentences, we may say:

S is *factually grounded* (relative to *K*) iff there is some true *K*-free ϕ such that ϕ quasi-demands *S*.

¹¹I am glossing over details. One detail that is particularly important is whether the nihilist has a guarantee of the existence of a plural term 'the *ys*' to complete a constitution sentence for each and every composite-name. If we could make sense of the idea of plural names, the nihilist could simply say that there is an extension of English (or 'logicese') in which, for any simples, the *xs*, the *xs* have a name (and for convenience only one name). This is not an outrageous idea. Here is an apparent introduction of a plural name. 'Consider all people over 6' tall, let's call *them* the *As*.' The set of constitution sentences for *K*-names would then be a set of sentences in such a language which contains for each English composite-name a single constitution sentence.

There are other approaches (e.g., appealing to list-like plurals of the form '*a* and *b* and *c* and ...', where *a*, etc. are proper names for individual simples in some extension of English allowing infinitely long sentences, or appealing to plurals of the form 'the simples collectively occupying location *L*', in an extension of English in which every location is named).

¹²I should point out that other relativizations may be useful to eliminativists. For example, we who deny the gods of Greek mythology may wish to say that 'Zeus threw a lightning bolt at 10pm' may be factually sound while its negation is not, by virtue of the fact that the former quasi-demands nothing false of the god-free world relative to the apt lawlike generalization 'there is lightning in the sky at a time only if and because Zeus threw a lightning bolt'.

In fact, the core notion of factual soundness is really a relative one: *S* is *K*-factually sound relative to such and such constraints. I take the word 'constraints' here from Perry and Israel [1990], who relativize information-carrying to constraints.

We also need the relativizations. The nihilist will rightly take the truth of ‘there are no simples arranged winged-horse-wise’ to tie down the aptness of ‘there are no winged horses’, and take the truth of ‘the *xs* are not arranged redhead-wise’ to tie down the aptness of ‘Bush is not a redhead’. Thus, we must move to the more complex definition:

S is *factually grounded* (relative to *K*) iff: there is a true *K*-free φ such that either (i) φ quasi-demands *S*, or (ii) *K* has constitution principles, and φ quasi-demands *S* relative to the distinguished constitution principle for *Ks* and the set of constitution sentences for *K*-names.

If a sentence is factually grounded relative to *K*, then it is rooted in how things stand in the *K*-free world. How things stand in the *K*-free world will commit the *K*-realist to accepting *S*. How things stand in the number-free world commits the numbers-realist to ‘ $1 + 1 = 2$ ’, but to neither ‘1 has an intrinsic primitive property that 2 lacks’ nor its negation. The realist arguably must think that the latter is either true or false. But the eliminativist will see the question as non-factual insofar as its answer is unconstrained by the world of non-numbers.¹³

Sentences that are both factually sound and factually grounded relative to *K* deserve to be called *factual* relative to *K*. If *S* meets both of these conditions, then *S* is both in the clear as far as the *K*-free world goes and suitably tied down by the *K*-free world. That, I think, is a good notion of factuality.

If the category *K* is *conservative*, then the class of sentences that are factual relative to *K* will have some interesting structural features, relevant to the next section of the paper. We use ‘conservative’ here in a somewhat non-standard way: on our use, *K* is conservative iff all *K*-free truths are *K*-apt and no *K*-free falsehoods are *K*-apt. In many if not most debates in contemporary ontology both sides agree that our conservativeness condition is satisfied (e.g., in the debates over universals, numbers, propositions, moral properties/facts, tropes, boundaries, and composites). The intuitive idea behind conservativeness is that whether there are *Ks* has no bearing on how things stand in the world of non-*Ks*.

An important consequence of *K*’s conservativeness is the closure of *K*-factuality under logical entailment.¹⁴ That is, if *K* is conservative, then if

¹³My definition of factual groundedness is a first approximation. An adequate definition would go beyond the purely modal notion of *demanding* to the explanatory notion of *grounding*.

¹⁴Here is a sketch of a proof. Our conclusion follows from two lemmas:

Lemma 1: if *K* is conservative, then any factually grounded sentence is apt, and any apt sentence is factually sound.

Lemma 2: if the *S_is* logically entail *T* and the *S_is* are factually grounded, so is *T*.

Lemma 1 is fairly obvious. If *K* is conservative and *S* is factually grounded, then there is some true *K*-free φ that quasi-demands it. But because *K* is conservative, φ must also be apt, and so therefore must *S*. (It is irrelevant whether the quasi-demanding is relativized or not.) Thus, any factually grounded sentence is apt. A similar argument shows that any apt sentence is factually sound.

Proof of Lemma 2. Suppose that the *S_is* logically entail *T* and the *S_is* are factually grounded. We show *T* is factually grounded.

the S_i s are all K -factual, and the S_i s logically entail T , then T is K -factual. If the class of K -factual sentences has this closure feature, then the eliminativist can see logical inferences involving K -sentences as K -factuality-preserving. She can therefore allow that the realist does not stray from the K -free world by inferring the conclusions of logically valid arguments all of whose premises are factual.

One final concept will be useful below: *factual content*. Suppose K is conservative and that S is such that there is a K -free ϕ such that S and ϕ are *quasi-equivalent*, or quasi-demand one another. Then we will say that a K -sentence S has *factual content* relative to K , or K -factual content, and that S 's factual content obtains iff some K -free quasi-equivalent of S is true.¹⁵ We will call the K -free sentences that are quasi-equivalent to a given sentence *factual contents* for that sentence. S 's factual contents are themselves equivalent to one another. Finally, note that sentences with K -factual content are apt iff their K -factual contents are true iff they are factual.¹⁶

B. Avoiding Puzzles

Suppose that the eliminativist gives a puzzle-avoidance argument, citing an inconsistent set of sentences $\{S_1, \dots, S_n\}$ representing a puzzle for K -realists. How can such an argument backfire?

One might think that just as the realist about K s faces a puzzle in the S_i s, so the eliminativist faces a problem in the corresponding aptness-ascriptions, the sentences 'given K s, S_i is true'. Given that aptness is closed under logical entailment, so long as no contradictions are K -apt, this set, too, is inconsistent. Even so, this 'aptness set' need not represent a serious puzzle for the eliminativist. Given the Christian God, is God in time or outside of it? The atheist might be tempted to say, dismissively, 'beats me!' Even the atheist who takes such a question seriously needn't feel the same sort of pressure the theist feels to solve it or at least to see how it could be solved. In the end, she might claim that there is no fact of the matter about whether 'God is in time' is apt or not. It is not outrageous, after all, to suggest that counterpossible conditionals can be truth-value gaps, indeterminate in truth-value, or in some way semantically defective. The theist is

First, consider the case in which K lacks a constitution principle. Because the S_i s are factually grounded, there are K -free truths, the ϕ_i s, which severally quasi-demand the S_i s. Their conjunction will therefore be a true K -free sentence which quasi-demands $S_1 \& \dots \& S_n$, which in turn entails and so quasi-demands T . Thus, T will be quasi-demanded by a true K -free sentence, and so factually grounded.

Second, consider the case in which K has a constitution principle CP. Suppose that the S_i s are all factually grounded and jointly entail T . Thus, there are K -free truths, the ϕ_i s, which severally quasi-demand the S_i s relative to CP and CS. The conjunction $\phi_1 \& \dots \& \phi_n$ will therefore be a K -free truth which quasi-demands $S_1 \& \dots \& S_n$ relative to CP and CS, and $S_1 \& \dots \& S_n$ will in turn quasi-demand T relative to CP and CS. It follows that there is a K -free truth— $\phi_1 \& \dots \& \phi_n$ —which quasi-demands T relative to CP and CS. (This follows insofar as each ϕ_i 's quasi-demanding S_i relative to CP and CS is a matter of ϕ_i , CP, and the members of CS jointly quasi-demanding S_i , i.e., of their jointly demanding S_i given K s.) Thus, T is factually grounded.

¹⁵If there is an apt constitution principle for K , then we should speak of quasi-equivalence and factual content relative to the distinguished K -constitution principle (CP) and set (CS) of constitution sentences for K -names.

¹⁶Yablo [ms] develops similar resources for understanding 'factuality' or what he calls 'counting as true'. I learned of Yablo's new work just recently, and have not yet made a careful study of it.

not in the same boat. ‘God is in time’ ought to be a question of fact for her—true or false—and determinately so.

The waters need not be so smooth for the eliminativist if, in an effort to answer the charge of extreme counter-intuitiveness, she is forced to acknowledge the factuality of many *K*-sentences. The pressure the *K*-realist feels to accept the truth of the *S*_{*s*} might well be felt by the eliminativist as pressure to accept their factuality. If it is equally difficult for the eliminativist to deny the factuality of one of the *S*_{*s*} as it is for the realist to deny the truth of one of the *S*_{*s*}, her puzzle-avoidance argument citing the *S*_{*s*} will backfire. When the eliminativist admits that the *S*_{*s*} have factual contents, the threat of backfire can become very clear.¹⁷

Here is a toy example. Suppose that a proposition-eliminativist argues that if we deny propositions, we can avoid sceptical puzzles. In particular, suppose she argues as follows, about claims (A)–(C) below. ‘Given propositions, the combination of A–C poses a seemingly insoluble puzzle that must have a solution. If we reject propositions, the puzzle goes away, for we can say that A and B are vacuously true and C is false, but C’s falsity does not mean that we are ignorant that snow is white. We know this. Knowledge is not matter of being related to a proposition.’

(A) If I know a mundane proposition, then I must know the falsity of sceptical propositions inconsistent with it.

(B) I do not know the falsity of sceptical propositions.

But (C) I do know the mundane proposition that snow is white.

But don’t (A)–(C) all appear factual? Given that the category of proposition is presumably conservative, not all can be factual. Which are and which aren’t? That question seems just as hard for the eliminativist to answer as the corresponding question for the realist ‘Which are true and which aren’t?’ Each of (A)–(C) seems to have factual content, at least supposing that quantifications over propositions have the corresponding infinite conjunctions/disjunctions as their factual contents. To deny the factuality of (C) is to deny its quasi-equivalent ‘I know that snow is white’. To deny the factuality of (A) or (B) is to deny the corresponding infinite conjunction/disjunction. So, for example, to deny the factuality of (B) means denying the truth of the infinite conjunction of claims of the form ‘I do not know that $\sim p$ ’, which deny knowledge that one is not in a sceptical scenario. Denying this is just as hard for the eliminativist about propositions as denying (B) is for the realist. The same goes for (A) and (C).

¹⁷What is to stop the eliminativist from simply taking each of the inconsistent *S*_{*s*} to be factual? Factuality requires factual soundness, and if even a single sentence is factual sound relative to *K*, then no contradictions are *K*-apt. For if a contradiction is *K*-apt, then because contradictions demand everything, every sentence is *K*-apt, and so for every sentence *S* there will be an apt sentence ‘*S* demands φ ’ where φ is a *K*-free falsehood. It might be protested that the eliminativist could deny that the aptness of everything follows from the aptness of a contradiction. But this would require her to defend a kind of logical revisionism in general. One of the features ‘given *K*s’ must have if it is to function in debates about *K*s in the way that it does, is that any true ascription of logical entailment is true given *K*s.

Thus, the prospect of avoiding this sceptical puzzle cannot be the basis of plausible argument for rejecting propositions. The argument backfires. The rest of the paper is concerned with a puzzle-avoidance argument which, unlike the above toy argument, has been given by real philosophers.

II. Nihilism and the Puzzles of Coincidence: A Case Study

A. The Statue/Lump Puzzle

Let us put nihilism aside for a few moments, while we attempt to see why the statue/lump puzzle proves so intractable.

Suppose that, at time t , in front of us there is a statue made of malleable clay. In front of us there is thus a statue and a lump, occupying exactly the region at the same time. Is the statue identical to the lump? Suppose that immediately after t we apply a flattening blow. Afterwards, it appears that the statue was destroyed but the lump was not.

Here is a case for thinking that the statue and the lump are distinct things that share all their parts before the flattening, for thinking, in other words, that they *coincide* before the flattening. Given that the statue was destroyed and the lump was not, then by Leibniz's Law the statue isn't identical to the lump. Thus, the statue and the lump must have been *two* material objects in the same place at time t , that is, two *co-located* objects. More than this can be said. At t , the statue and the lump are composed of all the same things, at least at some level of decomposition (molecules, atoms, simples). But if two things are composed of all the same things at some level of decomposition, it is hard to resist the conclusion that they have *all* the same parts. So, it appears that the statue and the lump are distinct objects that share all the same parts at t , and so they coincide at t .

So there is pressure to accept coincidence in the statue/lump case. But there is also pressure to reject it. If two material things are coincident at a time, then it would seem that they must be alike with respect to how they are at that time. More precisely, they should share all *basic* properties at the time, where a basic property is a property the possession of which at a time depends only on events happening at that time. If x and y coincide at t , clearly if x is round, so is y , and if x weighs 5lbs., so does y . Some basic properties are not intrinsic, of course. But if x is 5' from a third object, so is y . There is much more to be said, but there is a strong case to be made for thinking that things having all the same parts at a time are also basic duplicates at that time. But, whether a thing persists immediately after a time should be fixed by its basic properties at that time. What else could matter to persistence besides intrinsic character, together with all environment-related properties? What else do the natural laws have to work on to determine persistence? And surely in the statue/lump case it is determined of the lump that it will persist and determined of the statue that it will not. Again, there is much more to say.

But putting the pieces together, we arrive at the following supervenience principle:

Supervenience If x and y have the same parts at a time, then x persists immediately after that time iff y does.

Supervenience, together with the claim that the statue and the lump share all parts at a time, creates pressure to deny that the statue and the lump coincide. These pressures, for and against coincidence, affect all proposed solutions to the puzzle.

My purpose in this short section is obviously not to argue that these puzzles cannot be solved, but only to show that answering them is no easy feat.¹⁸ The difficulty of the puzzles of coincidence makes compositional nihilism seem attractive. And some philosophers have given a puzzle-avoidance argument for nihilism on this basis [Hossack 2000: 428; Merricks 2001: 38–47; van Inwagen 1990: 129]. However, we need to ask questions about the factuality of composite-sentences before judging the merits of this sort of argument.

B. On 'Given Composites'

What is the content of 'given composites'?

There are a number of (partial) philosophical *theories* of composites. We may think of a philosophical theory of composites as a theory giving existence and identity conditions for composites, and perhaps also character conditions (conditions for composites having certain properties and standing in certain relations). There are many partial theories of composites, insofar as there are many accounts of the existence conditions for composites: for example, *universalism* (any things always compose something); *the life-theory* (any and only things organized in life-ish ways compose something), *the contact theory*, etc. One is not likely to find good arguments that these accounts are provably false on conceptual grounds alone. The folk may well balk at the suggestion that there is a thing composed of the Eiffel Tower and George Bush, but it is hard to see this suggestion as involving a conceptual error.

When the nihilist cites the statue/lump puzzle as a reason to deny the existence of composites, she will wish for her argument to have the broadest scope possible. She will not wish to confine herself to composites as conceived under some specific philosophical theory, but to composites conceived in such a way that, given how things stand in the world of non-composites, objects like those mentioned in the puzzles exist. That is, she will want to argue against composites conceived in such a way that, given how simples are, there are statues, lumps, and other *folk composites*, or objects recognized in ordinary judgements.

¹⁸Nothing hinges on my particular account of what is vexing about the statue/lump puzzle. The reader is free to substitute her favoured account (perhaps one appealing to some intuition of 'overcrowding').

The nihilist who invokes the puzzles of coincidence in a puzzle-avoidance argument should admit that her argument cannot establish nihilism in general but at best nihilism about folk composites. So, when she is discussing the question of whether sentences figuring in the puzzles are factual or not, she must take her uses of ‘given composites’ to mean ‘given folk composites’. We will do the same in what follows.¹⁹

C. Nihilist Paraphrasis and Factual Content

Nihilists have every reason to think that many composite-sentences are factual. ‘There are chairs’, for example, is ‘in the clear’ and ‘tied down’ by how things stand in the composite-free world, and so is factual. In this section, I will argue that Peter van Inwagen’s well-known project of nihilist paraphrasis, if successful, specifies *factual contents* for a large class of composite-sentences, including, as we will see, the sentences figuring in the statue/lump puzzle (and in the other puzzles of coincidence). In subsequent sections, I will argue, further, that if van Inwagenian paraphrases do specify factual contents, then the puzzle-avoidance arguments citing the statue/lump (et al.) will backfire.

It is clear enough *how* to provide van Inwagenian [1990] paraphrases, at least for simple first-order quantifications over composites. The basic strategy, as Dorr and Rosen [2002] put it, is to ‘replace singulars throughout with plurals’. One replaces singular variables bound by singular quantifiers with plural variables bound by plural quantifiers, and singular predicates with their corresponding plural forms.²⁰ Where English does not afford us a plural form of a predicate, one appends ‘-wise’. Van Inwagen adds certain wrinkles to handle mereological sentences. Instead of replacing ‘is part of’ with *are part of* or with *are related partwise to*, one is to replace it with *are among*. Van Inwagen does not discuss the case of names, but we may also require a given composite-name *N* to be replaced with a plural referring term ‘the *xs*’ which is such that ‘*N* is composed of the *xs*’ is constitution sentence for *N*. We are not able to write out such paraphrases. Nevertheless, they exist. For the moment, let us ignore temporal and modal composite-sentences.

Here are some representative examples of van Inwagenian paraphrases:

‘There are chairs’ is paraphrased as *there are some simples arranged chairwise*.

‘The statue is 3’ tall’ is paraphrased as *the simples arranged statuewise are arranged 3’-tall-wise*.

¹⁹The category of ‘folk composites’, is of course extremely slippery. Is an *arrow on a computer screen* a folk composite? Is Chicago’s skyline? These worries needn’t bother the eliminativist, however. She doesn’t wish to raise doubts about the fringe cases but about the clear cases of folk composites. She would be happy to set up the puzzles as puzzles about persons and bodies, if necessary. She might then choose to construe ‘given composites’ in her talk of factuality as ‘given composites of *these* kinds: ...’

²⁰We will put aside the difficult case in which the original sentence contains plural quantifiers over composites. See Gabriel Uzquiano [ms] for discussion. An alternative for the nihilist is simply to replace the use of plurals in paraphrases with the use of singulars for sets of simples. Note 31 discusses the legitimacy of the nihilist’s use of set-theoretical machinery in paraphrases.

'The statue is on top of the table' is paraphrased as *the simples arranged statuewise are (collectively) on top of the simples arranged tablewise*.

'The top is part of the table' is paraphrased as *the simples arranged topwise are among the simples arranged tablewise*.

'Bush is a redhead' is paraphrased by a sentence of the form *the xs are arranged redheadwise*, where 'Bush is composed of the xs' is apt.²¹

The word 'paraphrase' is an unfortunate choice, because it suggests a hermeneutical project of supplying the 'real' or reconstructed meanings of composite-sentences [Alston 1959; Quine 1953]. This is not what van Inwagen intends. He tells us that his paraphrases 'describe the same fact' as the sentences paraphrased [1990: 113]. In general, S and $P(S)$ will not be alike in truth-value, and so cannot be said to describe the same fact in the straightforward sense of both being true iff a certain fact obtains. Suppose $P(S)$ is true specifies a factual content for S . Then we can give clear content to talk of 'describing the same fact'. $P(S)$ and S describe the same fact insofar as there is a composite-free condition such that $P(S)$ is true iff S is apt iff that condition *obtains*. The relevant condition will be expressed by the factual content that $P(S)$ specifies.

Talk of 'specifying' is dodgy. Why not say that $P(S)$ is a factual content for S ? It all depends on whether paraphrases involving van Inwagen's artificial predicates are composite-free. So, let us ask: what is it to be arranged, say, chairwise? The answer cannot be: *to be arranged in such a way as to compose a chair*. So construed, P ('there are chairs') would not only fail to be composite-free, it would be a positive composite-sentence, and so one that the nihilist couldn't accept. Van Inwagen suggests the following account:

we may say that the xs are arranged chairwise just in case that, given their intrinsic properties and the causal and spatiotemporal relations in which they stand to one another and a correct and complete list of 'principles of

²¹This note sketches a recursive definition of van Inwagenian paraphrases for a first-order language L . L may be viewed as a first-order fragment of philosophical English or 'logicese', with a countably infinite stock of singular composite-variables x_1, \dots , a set of composite-names, and a set of primitive composite-predicates. Paraphrases are sentences of a language L_I that is an extension of logicese (and so of L) which contains a countably infinite stock of plural variables x_1s, \dots , a plural predicate *Rwise* for each primitive L -predicate R , and which contains, for any set of simples, exactly one canonical plural designator ('name') for its members.

Let α be the function from the set of L -singular terms (names and variables) to the set of plural terms of L_I such that, for any L -name N , $\alpha(N)$ is the canonical name δ for the members of a certain set of simples and δ is composed of the δ^1 is an apt L_I -sentence, and for any L -variable x_i , $\alpha(x_i) = x_i s$. Our paraphrase function is definable as follows (omitting parentheses):

Atoms: $P(\lceil R(t_1, \dots, t_n) \rceil) = \lceil Rwise \rceil \wedge \alpha(t_1) \wedge \dots \wedge \alpha(t_n)$ (Where R has an ordinary English plural form, it may be substituted for *Rwise*.)

Negation: $P(\lceil \sim A \rceil) = \sim \lceil A \rceil$

Conjunction: $P(\lceil A \& B \rceil) = \lceil A \rceil \wedge \lceil B \rceil$

Quantifiers: $P(\lceil \exists x_i A \rceil) = \lceil \text{there are } x_i s \text{ such that } A \rceil$

composition' . . . it is deducible that whatever they compose has C_1, C_2, \dots, C_n [where these are the properties in terms of which 'chair' is defined].

[1993: 719]

I think we can make several friendly amendments here. First, we can avoid appealing to the properties definitional of chairs and simply speak of 'composing a chair'. Second, we can fold the talk of the intrinsic properties of simples and their causal relations and so on into talk of being arranged in composite-free ways.²² Here we put aside nominalism. Third, because we are paraphrasing only non-temporal and non-modal sentences, we can replace the talk of 'whatever they compose' with 'the thing that they compose'. Fourth, we may say that a property A of simples (i.e., a way simples can be arranged) demands a property B iff, for any metaphysically possible world w , and any x s, the x s instantiate A at w only if they instantiate B at w . Quasi-demanding between properties is explained as demanding, given composites. Making these modifications, we arrive at:

The x s are arranged chairwise iff: the x s are arranged in some composite-free way that quasi-demands *composing exactly one thing and a thing which is a chair*.²³

And generally for any primitive (and temporally basic²⁴) predicate ' F ' for composites, we have:

The x s are arranged F -wise iff: the x s are arranged in some composite-free way that quasi-demands *composing exactly one thing and a thing which is F* .²⁵

Given this explanation, sentences in which *chairwise* and the like figure are never composite-free, strictly speaking; for they have semantic analyses in which the *analysans* contains quantifiers that are not restricted to non-composites. So, P ('there are chairs') will not itself be a factual content for 'there are chairs'. To see how the paraphrase might nonetheless legitimately be said to specify a factual content, it will be useful to think a bit about supervenience.

Suppose the A -properties supervene on the B -properties. A particular A -property A_i may be such that it can be instantiated by a thing only if the thing has a B -property which demands A_i . If so, then A_i demands the second-order property *having some B -property that demands A_i* . Because that

²²Here is a rough criterion: where W is a way that simples can be arranged, W is composite-free iff it is a way for simples to be arranged that is neither composite-implying nor analysable in terms of composite-implying ways. This criterion is analogous to the one we gave earlier for K -predicates. See note 8.

²³To have the property *composing exactly one thing and a thing which is a chair* is to be some x s such that the composite the x s compose is a chair, or in other words to be some x s such that there is exactly one thing that the x s compose and everything they compose is a chair.

²⁴A temporally basic predicate is one that expresses a temporally basic property, or a property 'intrinsic to the time of instantiation', or in other words a property which is instantiated at t solely in virtue of how things stand at t . See Perry [1972]. I will suppress this parenthetical remark in what follows.

²⁵I suppress relativizations to constitution principles and sets of constitution names.

An alternative way of construing F -wise, for the nihilist, is to employ Kaplan's [1978] *dthat* device, and say that F -wise is to mean *are arranged in dthat way* [the disjunctive way whose disjuncts are all the composite-free ways simples can be arranged that, given composites, demand of simples that the thing they compose is F].

second-order property also demands A_i , the two are equivalent. Assuming that demanding relations between properties are noncontingent, we may conclude that the second-order property is equivalent to a disjunctive property *has B_1 or B_2 or ...*, where the B_i s comprise the properties that demand A_i . Now, while the sentence ' x has a B -property that demands A_i ' is clearly not A -free, it is equivalent to something that is, namely ' x has B_1 or B_2 ...'. The former also provides a kind of recipe for determining the latter, because the B_i s are the properties that meet the condition *being a B -property that demands A_i* . Given that the former has these features, it may be said to *specify* an A -free content for ' x has A_i '.

Let *being F* be a composite-property expressed by a primitive composite-predicate ' F '. Consider the property of simples, *composing exactly one thing and a thing which is F* , or for short *composing a unique F* . It is plausible to think that *composing a unique F* is quasi-equivalent to *being arranged in some composite-free way that demands composing a unique F* .²⁶ Assuming that, given composites, what demands what is a metaphysically necessary matter, it follows that *composing a unique F* is quasi-equivalent to some disjunctive way W_1 or W_2 or ... where the W_i s comprise all of the composite-free ways which quasi-demand *composing a unique F* . The way W_1 or W_2 or ... will be a composite-free equivalent of *being arranged F wise*.²⁷ The two are equivalent because *being arranged F wise* consists in *being arranged in some composite-free way that quasi-demands composing a unique F* , and the W_i s comprise the ways that quasi-demand *composing a unique F* . So, despite the fact that P ('there are chairs') is not composite-free itself, it is equivalent to a composite-free sentence of the form ' $\text{there are } x\text{s that are arranged in } W_1 \text{ or } W_2 \text{ or ...}$ '. If this latter is a factual content for 'there are chairs', then P ('there are chairs') can be said to specify it.²⁸ In general, to claim that $P(S)$ specifies a factual content for S is to claim that $P(S)$ is equivalent to a composite-free sentence that is a factual content for S .

Suppose that, where ' F ' is a primitive predicate for composites, every property of the form *composing a unique F* is quasi-equivalent to some composite-free property W_1 or W_2 or ..., and similarly for relational predicates. It follows that every van Inwagenian paraphrase will be equivalent to some composite-free sentence. In particular, $P(S)$ will be equivalent to the sentence $P(S)^+$ that results from it by replacing each occurrence of each primitive plural predicate with the corresponding predicate expressing W_1 or W_2 or ... If, in addition, S is quasi-equivalent to $P(S)^+$, then $P(S)$ will specify a factual content (viz., $P(S)^+$) for S .²⁹

²⁶We continue to suppress the relativization to the composite-constitution principle and the set of constitution sentences for composite-names.

²⁷The reader might worry whether there are always determinate answers to questions about what quasi-demands what. We will return to the issue of determinacy in the final section of the paper.

²⁸One might wonder whether all composite-free ways in which simples can be arranged (or at least all that are expressed by a disjunct in some property quasi-equivalent to some property of the form *composing a unique F*) are expressible in some extension of logicese. I do not see a difficulty with the claim that they are named in some such extension. However, if expressive worries are getting in the way, the nihilist who accepts propositions might treat demanding, and so quasi-demanding, as a relation between sentences and propositions. S demands P iff, for any world w , if S is true when evaluated at w , then P is true at w .

²⁹See the Appendix for a sketch of a proof that S and $P(S)^+$ are quasi-equivalent.

In what follows, I want to look at the consequences of the claim that van Inwagenian paraphrases succeed in specifying factual contents. First, however, we need to extend van Inwagenian paraphrasis so as to make it applicable to sentences of the kind that figure in the puzzles of coincidence, that is, to temporal sentences.

D. Paraphrasis of Temporal Sentences

The nihilist will wish to respect the factuality of many humdrum sentences of persistence such as ‘the house survived the earthquake’ and ‘I taught class yesterday’. These, in fact, ought to have factual contents just as much as atemporal sentences such as ‘there is a statue over there’.

Assuming the nihilist wishes to paraphrase sentences about persistence, how should she proceed? What is the paraphrase for ‘the *F* persisted through event *E*’? It won’t suffice to construe persistence in terms of diachronic identity and then replace ‘is identical to’ with ‘are’, because there are many factual composite-sentences about objects changing parts over time, which (in the typical case) involves changes in composing simples over time. Rather, claims of persistence are factual only insofar as simples at one time are related in certain ways to possibly distinct simples at another.

I recommend the following approach. Just as the barebones scheme of paraphrasis we considered in the previous section eliminates composites in favour of the simples that compose them, so its temporal counterpart should eliminate composites in favour of the simples that compose them at various moments of their careers. To make this more precise, we use the notion of an *assignment*. An assignment is any function from times to sets of simples.³⁰ These functions may be viewed extensionally as sets of ordered pairs $\langle t, \{the\ xs\} \rangle$, where *t* is a time and the *xs* are simples.³¹

Our scheme of paraphrasis should not (nor the old one, really) dictate that any old function corresponds to a would-be composite object. (We do not want ‘there is something composed of Bush and Gore’ to have an obviously true paraphrase.) So, let us say that an assignment *f* is an *object** iff the members of *f*—the ordered pairs—are arranged in some way *w* such

³⁰Here I am applying, on behalf of the nihilist, a concept defined by Sider [2001: 133].

³¹Some philosophers will question the nihilist use of set-theoretical machinery here. Wouldn’t the nihilist thereby identify composites with the set-theoretical entities, rather than eliminate them? I don’t think so. Even if the set-theory is ineliminable, paraphrasis does not effect an identification, because the relevant set-theoretical entities will have different modal properties than composites. It is correct to say that I could have had a hair-cut yesterday, but it is not true that the relevant assignment could have had a different value for yesterday. I will therefore give the nihilist the benefit of the doubt, and make free use of set-theoretical machinery on her behalf.

One might ask whether we would have the materials for a reduction after developing a scheme of paraphrasis to accommodate modal claims about composites. A composite would be a function from worlds to the sorts of objectual assignments we’ve been discussing. Wouldn’t composites be reintroduced as functions? The matter is not so clear. For one thing, actualist scruples may hamper the scheme. Some composites could have had parts which do not in fact exist. So there will be no function from worlds to assignments involving such objects. Moreover, even if the scheme of paraphrasis could solve this problem, there remain serious questions about whether functions from worlds to assignments are the right kind of entity to count as eligible referents of our ordinary talk. For one thing, ‘cat’ seems to refer to a this-worldly object, and so not to an entity built up set-theoretically from non-actual possibilities. For another, it does not seem necessarily true that a cat must be composed of simples at each moment of its existence: couldn’t a cat be composed of bottomless gunk?

that, given composites, being arranged *Wly* demands *diachronically composing exactly one object* (i.e., where f has the property of diachronically composing exactly one object iff there is exactly one object that exists at all and only the times in f 's domain, and for each such time t , that object is composed by members of $f(t)$ at t).³²

In this new setting, paraphrasis proceeds a bit differently. Here are a few of the details. (We neglect modality entirely.)

Quantifiers and variables: Quantifiers and variables for composites are replaced with expanded quantifiers and variables for assignments: 'for some (all) x ' becomes *for some (all) objects* f* .

Proper Names: A composite-name N is replaced by an appropriate assignment name f_N such that ' N is diachronically composed by f_N ' is apt.

Primitive Predicates (excluding special predicates): Where a primitive predicate ' F ' needs no temporal index (e.g., where ϕ is 'is an object', or a substance sortal), we replace it with F^* , and say that F^* applies to f iff f is an object* and f 's members are arranged F -wise (i.e., arranged in some composite-free way that demands *diachronically composing a unique thing and a thing which is F*). Where F needs a temporal index and is temporally basic, we replace it again with F^* and say that F^* applies to f at t just in case f is an object* and $f(t)$'s members are arranged F -wise at t (i.e., are arranged in some composite-free way that demands *diachronically composing a unique thing and a thing that is F at t*). If F -wise has an ordinary English plural, use it instead. For example, *heavier than** applies to $\langle f_1, f_2 \rangle$ at t iff f_1 and f_2 are objects* and the members of $f_1(t)$ are heavier at t than the members of $f_2(t)$.

Special Predicates: 'exists at' applied to composites is replaced by *is defined at*. If 'is' in the original sentence expresses identity, we leave it unchanged. ' x is part of y at t ' becomes $f_x(t) \subseteq f_y(t)$ and 'the x s compose y at t ' becomes $\cup f_{x_i}(t) = f_y(t)$.³³

Here is an example of how the scheme works. Assuming 'statue' is a substance sortal, we have:

'There is a statue that is white at t but black at t' ' is paraphrased as *there is a statue* f that is white* at t and is black* at t'* .

The right-hand side is then true iff there is an assignment f meeting the following conditions: (i) it is a statue* (i.e., its members are arranged in some composite-free way that demands *diachronically composing exactly one*

³²Our assignments play a similar role to Keith Hossack's K -histories [2000: 427]. Where K is a kind, K -histories are maximal classes of same- K related facts of K -arrangement. Merricks acknowledges a relation of being arranged *same-statuewise* [2001: 176–7], but this and other sortal-relative relations do not provide sufficient materials to explain the factuality of many ordinary sentences, including 'the boy persisted through adolescence' and 'Many objects persist'.

³³Because assignments are singular entities, it is no longer problematic to paraphrase sentences involving plural quantifiers and plural referring expressions for composites.

thing and a thing which is a statue); (ii) $f(t)$'s members are arranged *whitewise*, and (iii) $f(t')$'s members are arranged *blackwise*.

Our new van Inwagenian scheme rules out permanent coincidence, insofar as paraphrases asserting permanent coincidence are false (no two functions have all the same members). Because we are concerned only with temporal versions of the puzzles of coincidence, this is not a serious defect. The scheme does not rule out temporary coincidence. The paraphrase of 'there are two objects composed by the same things at some time' is logically consistent: *there are two objects* f and f such that, there is a time t , such that for any object* g , $g(t) \subseteq f(t)$ iff $g(t) \subseteq f'(t)$* . It is a substantive question whether this is true, as it should be.

E. Back to the Statue/Lump Puzzle

As we saw earlier, the following set of sentences captures much of what is puzzling about statue/lump case. Call these sentences the *puzzle set* for the statue/lump:

Lump: The lump persists through the flattening just after t .

Statue: It is not the case that the statue persists through the flattening just after t .

Supervenience: If x and y have all the same parts at a time, then x persists immediately after t iff y does.

Same Parts: The statue and the lump have the same parts at t .³⁴

Suppose the nihilist invokes this puzzle set in an avoidance-argument: 'belief in composites brings with it the question of which member of the above set is false; we avoid this problem by denying composites'. Does this argument backfire? I am not sure. But I will provide reason for thinking the answer is affirmative if paraphrases specify factual contents.

When asked about what *she* thinks of the statue/lump puzzle, a nihilist will likely say 'well, I avoid it'. When asked about the aptness of the sentences involved, her first reaction might be to say, 'Beats me!' But if she must recognize the factuality of *some* composite-sentences, and some sentences about the persistence and destruction of composites, we may press her further, noting that she cannot say that all the members of the puzzle set are factual. Her likely reaction will be to say, 'I grant that many composite-sentences are factual, but not these; this is just philosophy'.

However, if the nihilist grants that paraphrases specify factual contents and that our scheme of paraphrase is applicable to the members of the

³⁴Little changes if we replace the definite descriptions 'the statue' and 'the lump' with the names except that we will be able only to describe the paraphrases not provide them.

statue/lump puzzle set, then she cannot reasonably take such a dismissive attitude. For we can ask her about the corresponding *paraphrase set*:

P(Lump): The lump* f is such that, for t' immediately after the flattening, $f(t')$ is defined.

P(Statue): It's not the case that the statue* g is such that, for t' immediately after the flattening, $g(t')$ is defined.

P(Supervenience): For any objects*, f and g , and time t^* , if, for any object* h , $h(t)$ is a subset of $f(t)$ iff $h(t)$ is a subset of $g(t)$, then f has a defined value for t' immediately after t iff g does.

P(Same Parts): The lump* f and the statue* g are such that, for any object* h , $h(t)$ is a subset of $f(t)$ iff $h(t)$ is a subset of $g(t)$.

The paraphrase set is of course every bit as inconsistent as the puzzle set. One of its members must be false. And if paraphrases specify factual contents, then each paraphrase $P(S)$ is true iff S is factual and iff $P(S)^+$ is true, where $P(S)^+$ is the composite-free equivalent of $P(S)$, resulting from appropriate replacement of starred predicates with composite-free predicates. The denial that S is factual is tantamount to the denial of $P(S)$. But why think $P(S)$ is false? Here the nihilist can appeal to the same sorts of considerations realists do: *P(Lump)* is false because the relevant assignment is not defined immediately after t . But why? It is hard to see how to answer this question except by piggybacking off the realist. Thus, the nihilist might answer 'because *lump** is not dominant over *statue** in Burke's [1997] sense'. The realist can of course follow Burke directly and say the very same thing, only about the kinds *lump* and *statue*. Alternatively, the nihilist might say that *P(Statue)* is false because the relevant assignment is defined immediately after t . But why? Perhaps because *statue** is a phase sortal over assignments. This is obviously borrowed from the realist move according to which *statue* is a phase sortal. The same goes for *Supervenience*. Why is its paraphrase false? The nihilist might claim that it must be restricted to assignments satisfying the same F^* where F is a substance sortal. But this is a realist move in nihilist clothing. It begins to seem that the problem of which paraphrase is non-factual is just as challenging for the nihilist as the original problem is for the realist. Her available answers to the problem are just going to be simple transformations of the realist's. If she can adequately defend her answer, it is hard to see why the realist cannot give the corresponding answer.

It might be thought that even though the nihilist has no distinctively nihilist way of finding the odd-guy-out in the statue/lump puzzle, still she has options the realist doesn't. She can say that there is just no fact of the matter whether certain sentences in the puzzle set are apt or not, and so whether they are factual or not. However, this move, too, has serious repercussions. For, if there is no fact of the matter whether S is factual, then there is no fact of the matter whether $P(S)$ is true, and given the equivalence of $P(S)$ and $P(S)^+$, there is also no fact of the matter whether $P(S)^+$ is true.

But the latter is a composite-free sentence. However the absence of a fact of the matter is understood—whether it amounts to a truth-value gap, a degree of truth less than 1 and greater than 0, or some kind of indeterminacy compatible with truth—it will trickle down to composite-free sentences.

So, if our van Inwagenian paraphrases specify factual contents, it seems that the nihilist's puzzle-avoidance argument based on the statue/lump (et al.) is in danger of backfiring.

Readers of van Inwagen's *Material Beings* may wonder whether its author misses what I purport to see. Van Inwagen recognizes that problems associated with artefacts might in principle survive nihilist paraphrasis [1990: 128], but he is confident they will not. Consider how he describes the Ship of Theseus case as seen through the lens of nihilism: first there were The First Planks arranged shipwise, and then The Second Planks arranged shipwise (with one of The First Planks placed in a field and replaced by a new plank), and so on, till The First Planks were in the field, at which time, after Theseus does his work, The First Planks are again arranged shipwise. About this story, we are told:

All that happens in the story is that planks are rearranged, shuffled, brought into contact, separated, and stacked. But at no time do two or more of these planks compose anything, and no plank is ever a proper part of anything. And this is not a defect in the story or in my way of telling the story. Nothing of philosophical interest has been excluded from the story. Everything that went on is represented . . . in my description of the way in which the planks were shuffled during a certain interval. There are, therefore, no philosophical questions to be asked about the events I have described. In particular, there is no such question as 'Which of the two ships existing at the end of the story is the ship with which the story began' for the story ended as it began: with no ships at all.

[129]³⁵

While van Inwagen's story describes all of the basic facts upon which all else supervenes, it entirely ignores issues about the factuality of composite-sentences about ships (e.g., 'the replacement ship is the original ship' and 'the reassembled ship is the original ship'). Once those issues are squarely faced, problems arise, in the way we have described in the body of the paper. Consider these sentences:

The replacement ship is the original.

The reassembly ship is the original.

The replacement ship is not the reassembly ship.

Identity is transitive.

³⁵In a similar vein, Hossack writes [2000: 428]:

The atomist avoids this puzzle [the ship of Theseus] too. There are two ship-histories, i.e., two conjunctions of classes of ship-related facts, and these ship-histories have some facts in common. That is no problem for the atomist—he does not assume that for every ship-history there is a ship whose history it is.

At least one of these must be non-factual. And it seems just as difficult for the nihilist to locate the odd guy out as it is for the realist.

The reader might wonder whether puzzle-avoidance arguments must backfire when the sentences making up the puzzle set have factual contents. I do think that in some cases what the realist perceives as a puzzle may be reasonably perceived by the eliminativist as a conflict between the acceptance of the realist's entities and a true topic-neutral principle. In such cases, the eliminativist will think she can solve the puzzle, conceived as a puzzle about factuality: the relevant topic-neutral principle is non-factual, and so inapt; and its inaptness is a reason to deny the existence of the entities. In this case, the eliminativist's solution to the puzzle about factuality provides her with a problem-avoidance argument against the entities in question, but not a puzzle-avoidance argument. For, she cites a principle which she claims is false given the entities but which we have independent reason to accept.

Here is an example. Consider the puzzle of the vagueness of composition. It seems vague what it takes to compose something, and yet it also seems existence must be precise. The nihilist might simply deny that 'existence is precise' is factual or apt, on the grounds that the sentence's paraphrase—'objecthood* is precise'—is false. She would appeal to the vagueness in what it takes, given composites, for some things to compose an object. But now, why can't a realist give this same argument? He can, but then he must deny a plausible topic-neutral principle about existence—that it is precise. (Play along with the idea that this principle is plausible.) The nihilist needn't deny the principle. When the realist says 'existence is precise', is he getting the world wrong? Yes. But he is also gesturing toward something right: despite the fact that the sentence is false given composites, it is in fact true, and the realist who asserts the sentence may appreciate the case for its truth.

One might wonder why the nihilist cannot think of the Ship of Theseus case similarly: despite the fact that identity is non-transitive given composites, the realist who says 'identity is transitive' appreciates the case for its truth.³⁶ Something similar might be said about Unger's problem of the many. If 'identity is transitive' is inapt, then we could have 'cloud candidate c = the cloud' and 'cloud candidate d = the cloud' and 'candidate c ≠ d' all apt.³⁷ I think this approach will not work. For one thing, our method of paraphrase makes the paraphrase of the transitivity claim come out true. (Van Inwagen's original scheme of paraphrase requires 'is' to be replaced by 'are', and of course the plural 'are' is transitive. Our temporal van Inwagenian scheme requires that 'is' is left alone. So the transitivity of identity in fact will guarantee the aptness of 'identity is transitive'.) Of course, these considerations are not decisive; one might devise a new method of paraphrase that did not decide such matters *de jure*. The more important point, I think, is that the transitivity of identity is a logical truth (recall that 'logical' here also encompasses 'conceptual'). And so, if 'A = B' is factual, and 'B = C' is factual, then 'A = C' is also factual. The quasi-grounds of

³⁶Both Mark Heller and Ted Sider pressed me on a similar sort question.

³⁷See Karen Bennett [ms] for a discussion of the problem of the many and nihilism.

'A = B' and 'B = C' are jointly quasi-grounds for 'A = C'. By contrast, 'existence is precise' is not a logical truth. Obviously, much hinges on what counts as a logical truth (and more specifically, a conceptual truth). But consider the following bad argument against composites. Given composites, each of 'the statue is destroyed', 'it's not the case that the lump is destroyed', and 'the statue is the lump' is true, and therefore Leibniz's Law is false. Because Leibniz's Law is true, we should reject composites. What makes this argument bad? The answer, I think, is that Leibniz's Law is true whether or not there are composites, because it is a logical truth and composites are not logically impossible. The same goes for the transitivity of identity, but not the preciseness of existence.

F. Indeterminacy and Factual Content

We have mostly ignored issues of indeterminacy in our discussion of factual content. It is time to fill this lacuna.

It is quite likely indeterminate which composite-free properties an assignment must have to be *statue**, an *object**, etc. and also indeterminate which assignment-names make the sentence-frame '*N* is composed by –' apt, where *N* is a composite-name. If there is at least that much indeterminacy, then there will be no composite-free sentences to which our paraphrases are determinately equivalent, because all our paraphrases involve either some starred predicate or assignment name. The term ' $P(S)^+$ ' will be indeterminate in reference. Thus, even though we will still have reason to think it is determinate that $P(S)$ is quasi-equivalent to S ,³⁸ we will have to give up the claim that there is a composite-free sentence which is determinately a factual content for *S*. *S* determinately has some factual content or other, but it is indeterminate what it is. What this means is that our 'trickle-down' argument from the last section will not work: without the determinate equivalence of *S* and some composite-free sentence, our case for 'trickle-down' indeterminacy collapses.

This, by itself, is not necessarily good news for nihilists wishing to cite the statue/lump (et al.) in a puzzle-avoidance argument. If the indeterminacy involved is due simply to the vagueness of composite-predicates (i.e., to a feature that accounts for their Sorites-susceptibility), there is no reason to think that it makes a difference to whether any member of the statue/lump puzzle set is determinately factual or not. The mere vagueness of 'statue' could not make it the case that, say, the sentence *Statue* failed to be determinately factual. The vagueness of 'statue' will make it indeterminate what it takes for an assignment to be such that, given composites, it satisfies 'composes a unique thing that is a statue', and so will make it indeterminate what it takes for an assignment to satisfy 'statue*'. But the range of indeterminacy will be rather narrow. The composite-free candidates for the

³⁸The proof sketched in the Appendix is readily transformable into a proof that *S* is quasi-equivalent to $P(S)$. In fact, the assumed equivalence of $P(S)$ and $P(S)^+$ is exploited in each step to derive the conclusion that *S* is quasi-equivalent to $P(S)^+$. I should point out that there remains a question of how to think of the relativization to 'the set of constitution sentences for *K*-names'.

satisfaction condition of 'statue*' will collectively form a blurred boundary rather than a set of sharply delineated alternatives. The statue/lump and the rest of the puzzles of coincidence, after all, are not vagueness puzzles. It is not vague whether the statue is destroyed after t (though it may be vague at which exact moment it may be destroyed—the word 'immediately' may be replaced with 'soon after'), nor whether the lump survives, nor whether the statue and lump share the same parts, nor whether things sharing all parts at t are alike in whether they persist after t .

The nihilist might reply that the indeterminacy involved is not induced by vagueness but by the existence of several equally acceptable but significantly different candidates for the content of the supposition 'given composites'. As noted earlier, we are using 'given composites' to mean the same as 'given folk composites'. If the content of the latter is indeterminate between, say, *given folk composites as conceived in such and such coincidence-friendly ways* and *given folk composites as conceived in such and such coincidence-unfriendly ways*, then the nihilist could see the puzzles of coincidence as insoluble precisely because they bring out an indeterminacy at the heart of the way we ordinarily think about folk composites.

With this 'indeterminist approach' we have at last a distinctively nihilist approach to the puzzles of coincidence, and one which leaves her free to cite those puzzles in avoidance-arguments, without worrying about their backfiring. The nihilist may claim that the puzzles contain some sentences which are indeterminate in their factuality status, but insist that the indeterminacy does not trickle down to indeterminacy in any composite-free sentence, because it is due to 'given composites', a clause that does not figure in composite-free sentences. So, the nihilist need not be hoist with her own petard in the way described in the previous section. Nor need she see herself as merely piggybacking off realist solutions to the statue/lump puzzle. The nihilist understands the indeterminacy involved as linguistic or representational, because it stems from the vagueness in the content of 'given composites'. By contrast, the realist who appeals to indeterminacy apparently must see the indeterminacy as either ontic or epistemic, on pain of making the general coincidence sentence 'Some things are sometimes coincident' come out determinately true. Here is the problem for the realist. Suppose *Statue* is indeterminate due simply to linguistic indeterminacy. Now, 'exists immediately after t ' is arguably linguistically determinate. So, the indeterminacy must attach to 'the statue'. Suppose this description is indeterminate in reference. Then there are two coinciding composites between which 'the statue' is referentially indeterminate. This will make 'some things are sometimes coincident' come out determinately true. To block this result, the realist will need to turn to ontic or epistemic indeterminacy. The nihilist needs no more than linguistic indeterminacy, and is free to say that it is indeterminate whether 'some things are sometimes coincident' is factual.

The indeterminist approach loses some of its lustre, though, when its consequences come into focus. Let me introduce a bit of terminology here. For any sentence S , let us call ' S is factual' the factuality-attribution for S . Note that because the statue/lump puzzle set is inconsistent, if the

factuality-attributions for any three members of the set are determinately true, then the same holds for the fourth member. So, to avoid calling any of the factuality-attributions for any members of the set determinately false, the defender of the indeterminist approach must claim that the factuality-attributions for at least two of the members are indeterminate. It should be uncontroversial that the factuality-attribution for *Same Parts* is determinately true. Under every admissible resolution of 'given composites', *Same Parts* has an obtaining factual content. (That is, however you admissibly associate assignments with 'the statue' and 'the lump', the associated assignments must share a value at *t*.) Because *Same Parts* is off the table, this means that the nihilist must set her sights on either *Statue* or *Lump* or both, and not only on the 'philosophical' claim, *Supervenience*. The problem with claiming that the factuality-attributions for *Statue* or *Lump* are indeterminate is that the statue/lump case is not some far-flung hypothetical case, but is an instance of a very common situation. Every time any artefact is destroyed, and every time a living thing dies, we have a statue/lump case. Indeed, even the destruction of a lump (by breaking it apart) is a statue/lump case, involving the lump (playing the 'statue' role) and the mass of matter (playing the 'lump' role). Saying that the factuality-attributions for *Statue* or *Lump* (or both) are indeterminate will commit the nihilist to saying the same thing about a huge set of claims about destruction and/or persistence that seem to us, when we're not thinking about philosophy, to state obvious facts, not matters of judgement or opinion. Once we turn to the other puzzles of coincidence, such as the Ship of Theseus case, the Body-minus puzzle, and the 'Body-plus' puzzle, it begins to seem that the puzzles of material coincidence are *everywhere*, so to speak. Just about *any* claim about the persistence or destruction of a material object can be made to fit into a coincidence puzzle. Any claim about part-replacement fits into one half of a ship of Theseus puzzle; any claim about reassembly fits into the other half. Any claim about part-loss fits into a Body-minus puzzle; any claim about part-gains into a Body-plus puzzle.

The nihilist who takes the indeterminist approach and regards the factuality-attributions for both *Statue* and *Lump* as indeterminate will be forced to say the same thing about nearly every ordinary claim about persistence or destruction. This seems an enormous cost to pay. 'Bush lost Rhode Island in the 2004 election' may not be true, but surely, one wants to say, it is determinately factual. (It is just as factual as 'the sky instantiates blueness', for example.) But our objector will have to disagree because it entails 'Bush existed in 2004', which, for him, is not determinately factual. In addition, if assertibility goes by determinacy of factuality-attributions, the nihilist, very implausibly, would have to deny the assertibility of most of our ordinary statements of persistence or demise of people, trees, chairs, etc.

A nihilist might try to reduce the indeterminacy by counting either *Statue* or *Lump* as determinately factual, and similarly for the other puzzles. The consequences will still be difficult to accept, because a great many ordinary 'obvious' claims about persistence (or destruction) will be counted indeterminate in factuality status. Moreover, it will be incumbent on the nihilist to tell us why it is *Statue* rather than *Lump*, or *Lump* rather than

Statue, which is determinately factual. Both have intuitive force. Both can be backed up with powerful principles. Suppose the nihilist says that *Lump* is determinately factual. Then Burke's [1997] 'dominant kinds' theory is determinately non-factual. But why? The nihilist may of course piggyback on realist responses to Burke, but I cannot see that there a distinctively nihilist story to be told here.

It is not clear, then, that things look rosier for the nihilist under the indeterminist approach to the puzzles of coincidence than they do under the 'straight' approach of spotting the odd-guy-out.

In the second half of this paper, I have not proved that nihilists cannot legitimately employ the puzzles of coincidence in avoidance arguments. But I do think I have made strong arguments for the following claims. First, if the sentences making up the statue/lump and other puzzles of coincidence have van Inwagenian paraphrases, and if these paraphrases specify factual contents, then it will be just as hard for the nihilist to answer the puzzles as it is for the realist, and so she will not be in a position to cite them in an avoidance argument. Second, while it is true that the nihilist may appeal to indeterminacy of factual content to give a distinctively nihilist answer to the puzzles, and one which puts her in a position to cite them in avoidance arguments, the indeterminist approach comes at a significant cost: a great many ordinary statements of persistence and/or destruction will fail to be determinately factual. Third, and most importantly, no nihilist, when asked about the statue/lump, should simply reply, 'No objects, no problem!'³⁹

Appendix

This note sketches a proof of the quasi-equivalence of S and $P(S)^+$. Our strategy will be to attempt to show, working under the supposition that there are composites, that S and $P(S)^+$ are equivalent.

Let us suppose that there are composites. Given composites, we may work with a different specification of paraphrases, one which gives the same results as that of note 21 for closed sentences but which gives substantive assignment-relative paraphrases for open sentences. As before, paraphrased wffs are L -wffs and paraphrases are L_I -wffs. Let the ρ_i s be (assignment) functions from the set of singular variables and names in L such that for any composite name N , $\rho_i(N)$ = the referent of N in L and such that $\rho_i(x_i)$ is a composite. Let σ be the 'composition function', that is, the function such that for any composite c , $\sigma(c)$ is the set of simples that (in fact) compose c . Finally, let δ be the function from sets of simples to the canonical

³⁹I thank three anonymous referees for helpful comments, which significantly improved this paper. I also extend a warm thanks to friends and colleagues who have provided comments on drafts of this paper, including Karen Bennett, Trent Dougherty, Alicia Finch, Mark Heller, John Hawthorne, Brian Kierland, Jon Kvanvig, Andrew Melynk, Jay Newhard, Ted Sider, Ted Poston, Steve Yablo, and especially Kris McDaniel and Jeremy Fantl. Thanks also audiences at the Central States Philosophical Meeting in Chicago 2003 and the Bellingham Summer Philosophy Conference 2004.

L_I -designator of their members. We define an assignment-relative paraphrase function P_ρ from composite-wffs in L to wffs in L_I such that:

$P_\rho(\lceil Rt_1 \dots t_n \rceil) = \lceil Rwise(\eta_1 \dots \eta_n) \rceil$, where η_i is the canonical plural name in L_I for $\sigma \circ \rho(t_i)$.

$P_\rho(\lceil \sim A \rceil) = \lceil \sim \rceil \wedge P_\rho(A)$

$P_\rho(\lceil A \& B \rceil) = P_\rho(A) \wedge \lceil \& \rceil \wedge P_\rho(B)$

$P_\rho(\lceil \exists x_i A \rceil) = \lceil \text{there are } x_i\text{s such that} \rceil \wedge P_\rho(A(x_i/\delta \circ \sigma \circ \rho(i_i)))$.

Paraphrase *simpliciter* is defined as follows: if $P_{\rho i}(S) = P_{\rho i}(S)$ for all i and j , then $P(S)$ exists and is $P_{\rho i}(S)$; otherwise $P(S)$ is undefined.

We next expand L_I to a language L_2 which contains a name for each composite-free way simples may be arranged. We show that $P(S)^+$ is equivalent to S relative to the distinguished constitution principle:

CP: For all x , x is composed of some x s, and x is composed of the x s that in fact compose x .

and relative to the set CN of all constitution sentences for composite-names in L .

We take our assumption that $P(S) = P(S)^+$ to be generalizable to assignment-relative paraphrases. Thus, we assume that for any L -wff ψ , $P_\rho(\psi)$ is equivalent to $P_\rho(\psi)^+$ relative to CP and CN. Call this thesis *our assumption*. Using it, we first prove a lemma:

Lemma: for any wff ψ of L , and any ρ , and any world w at which CP and the members of CN are true, ψ is true at w relative to ρ iff $P_\rho(\psi)^+$ is true at w .

In what follows, we let ' w ' range over worlds in which CP and the members of CN are true.

Base case: $\lceil Rt_1 \dots t_n \rceil$ is true at w relative to ρ iff the simples composing $\rho(t_1), \dots, \rho(t_n)$ at w jointly have the following property at w : *composing unique things arranged Rwise*. (Or rather, minding our corner quotes: they have at w the property of composing unique things arranged in way W , where W is expressed by $\lceil Rwise \rceil$.) Because CP is true at w , the simples composing the (ρt_i) at w are just the simples that in fact compose them, i.e., the members of $\sigma \circ (\rho t_i)$. The members of $\sigma \circ \rho(t_i)$ have a canonical plural name η_i in L_2 . Thus, the simples composing $\rho(t_1), \dots, \rho(t_n)$ at w jointly have the property of *composing unique things arranged Rwise* at w iff $\lceil Rwise(\eta_1, \dots, \eta_n) \rceil$ is true at w , and so iff $P_\rho(\lceil Rt_1 \dots t_n \rceil)$ is true at w . Given *our assumption*, the latter holds iff $P_\rho(\lceil Rt_1 \dots t_n \rceil)^+$ is true at w . Thus, $\lceil Rt_1 \dots t_n \rceil$ is true at w relative to ρ iff $P_\rho(\lceil Rt_1 \dots t_n \rceil)^+$ is true at w .

Negation: Suppose our hypothesis holds for an L -wff A . Show that it holds for $\lceil \sim A \rceil$. $\lceil \sim A \rceil$ is true at w relative to ρ iff A is not true at w relative to ρ iff, by the inductive hypothesis, $P_\rho(A)^+$ is not true at w relative to ρ , iff (by *our assumption*) $P_\rho(A)$ is not true at w relative to ρ , iff $P_\rho(\lceil \sim A \rceil)$ is true at w , iff (again, by *our assumption*) $P_\rho(\lceil \sim A \rceil)^+$ is true at w .

Similarly for conjunction.

Quantifiers. Let A be an L -wff. $\lceil \exists x_i A \rceil$ is true at w relative to ρ iff:

1. A is true at w relative to some ρ' which differs from ρ if at all only on the object assigned to x_i .

By the inductive hypothesis, (1) holds iff:

2. $P_{\rho'}(A)^+$ is true at w .

By our assumption, (2) holds iff:

3. $P_{\rho'}(A)$ is true at w .

In 3, x_i has been replaced with the canonical designator for the simples composing $\rho'(x_i)$, i.e., $\delta \circ \sigma \circ \rho'(x_i)$. Thus, we can conclude that 3 holds iff:

4. $\lceil \text{There are } x_i s \rceil \wedge P_{\rho'}(A)(x_i s / \delta \circ \sigma \circ \rho'(x_i))$ is true at w .

(We needn't worry about relativizing to assignment functions for plural variables, because A (an L -sentence) is free of plural variables, and our scheme of paraphrase doesn't add free plural variables.) Since ρ and ρ' differ at most on x_i , (4) holds iff:

5. $\lceil \text{There are } x_i s \rceil \wedge P_{\rho}(A)(x_i s / \delta \circ \sigma \circ \rho(x_i))$ is true at w .

By our paraphrase scheme, (5) says that $P(\lceil \exists x_i A \rceil)$ is true at w . Thus, given our assumption, it follows that (5) holds iff $P(\lceil \exists x_i A \rceil)^+$ is true at w .

It follows from our lemma that for any closed sentence S of L and any world w at which CP and the members of CN are true, S true at w iff $P(S)^+$ is true at w . That is, it follows that S is equivalent to $P(S)^+$ relative to CP and CN. This gives us our desired conclusion—which is *not* asserted on the supposition of composites: S is quasi-equivalent to $P(S)^+$ relative to CP and CN.

University of Missouri-Columbia

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