Chapter 4

Constitution, Lump Theory, Mereological Essentialism
and The Modal Objection

1. Introduction: The Modal Objection and Constitution

In Chapter 2, I explained how a CI theorist could defend herself against Van Inwagen's Counting Objection. In Chapter 3, I explained how a CI theorist could defend herself against four other kinds of objections: (i) those that appeal to the Indiscernibility of Identicals, (ii) those that appeal to the Principle of Ontological Parsimony, (iii) those that appeal to the Substitutivity of Co-referential Terms, and (iv) those that appeal to technicalities involving Plural Logic—in particular, the details of predicates such as *is one of.* Admittedly absent from these objections was what I have previously called the Modal Objection.

The Modal Objection runs as follows: Imagine that your hand is composed of millions of molecules. If CI is true, then your hand is simply *identical* to the millions of molecules. Yet there seems to be a clear difference-making feature between your hand and the molecules—namely, certain modal properties. Your hand could survive losing a few molecules here and there, but the molecules could not. Moreover, your hand could not survive being thrown in a blender, but the molecules composing your hand presumably could (assuming that we are dealing with a very precise and discerning blender).[1] Yet if your hand has a

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[1] I am modifying Wiggins' Tree and Cellulose example here, and his arguments against the claim that the tree just is the cellulose molecules. The modification? Wiggins considers only the *aggregate* of the cellulose molecules, a singular item, not the molecule*s*, plural. See Wiggins (1968).

property that the molecules do not—*viz.*, could survive a loss of molecules—and if the molecules have a property that your hand does not—*viz.*, could survive being thrown in a blender—then by the Indiscernibility of Identicals, your hand is not identical the molecules. So CI must be false.

This objection is related to certain other puzzles involving *constitution*. Imagine that we have before us a lump of clay that is sculpted into a statue; we typically say that the statue is *constituted* by the lump of clay. Yet many would resist claiming that the statue is (identical to) the lump of clay, because the statue and the lump of clay differ in certain properties. In particular, they differ in their modal properties: the statue could have had some of its clay bits replaced (by gold, or other clay bits, e.g.), but the lump of clay could not; and the lump of clay could have been sculpted into an ashtray, but the statue could not. Yet if the statue has a property that the lump of clay does not—*viz.*, could survive a replacement of parts—and if the lump has a property that the statue could not— *viz.*, could survive being sculpted into an ashtray—then by the Indiscernibiltiy of Identicals, the statue is not identical to the lump of clay. And so, for reasons parallel to the Modal Objection against the claim that *composition* is identity, we have reason to think that *constitution* isn't identity either.

Up until now, I have only been dealing with composition, not constitution. So one might wonder why I am changing the focus of my discussion now. This is because I think that the answer to the Modal Objection dovetails nicely with solutions to *constitution* puzzles. This is in part because I think there is no genuine distinction between the two kinds of puzzles, or the two kinds of

relations. Composition as identity (CI), I will argue, leads to a collapse of the distinction between the composition and constitution relation, and thus suggests that *constitution* is identity as well.[2]

Many have thought that composition and constitution are distinct relations, and hence, the puzzles that involve one are unrelated to the puzzles that involve the other. In recent philosophical literature, for example, it is often supposed that puzzles of composition are one thing, and puzzles of constitution are another.[3] In certain footnotes of this thesis, even *I* have adopted (albeit temporarily) one purported difference between composition and constitution: that composition is the relation between one thing and many (the parts and the whole, e.g.), whereas constitution is the relation between one thing and another (a statue and a lump of clay, e.g).[4]

I will argue below, however, that we have little reason to think this is difference-making feature between composition and constitution, *independent* of the truth of CI. Moreover, if CI is true, then we have even less reason to think that there is a distinction between composition and constitution.

Yet if composition and constitution collapse—if composition and constitution are indeed identity—then it seems that Mereological Essentialism follows as a consequence. Mereological Essentialism is the thesis that all objects have their parts necessarily. If the relation between (e.g.) your hand and its parts,

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[2] Thanks to Adam Sennet for helpful discussion on this topic.

[3] Sider (2001, 2006); Van Inwagen (1990); Rea (1995); Thompson (1998); suggested in Wiggins (1968), Wiggins (1980); et. al.

[4] See Chapter 1, footnote 17; Chapter 2, section 1; etc.

or the relation between (e.g.) a statue and a lump of clay, is identity, then by the necessity of identity, the hand and the statue must have all of their parts essentially.[5] This worry is the contrapositive of the Modal Objection: the Modal Objection claims that the parts and whole differ in their modal properties, and so CI can't be true. The Mereological Essentialism worry claims that *if* CI is true, then the parts and wholes cannot differ in their modal properties. And so if the parts cannot survive a loss of parts, neither can the whole; thus, wholes (i.e., any object made of parts) must have their parts essentially.

Below, I first aim to show that we have little reason to think that there is a principled difference between the composition relation and the constitution relation. In the course of this discussion, I will discuss Mereological Essentialism, and whether it follows from CI. I will then present four (traditionally labeled) *constitution* puzzles—the Marriage Paradox, the Ship of Theseus, Tib and Tibbles, and Goliath and Lumpl—and will show how a CI theorist might respond to them to them in a novel way,[6] by embracing Mereological Essentialism and a 'lump', or 5-dimensional, theory of objects.[7] This lump theory of objects also has the distinct advantage of being able to defend the CI theorist against the Modal

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[5] This argument as presented here is much too quick. I will lay it out more carefully in the sections that follow.

[6] While the view I am endorsing isn't originally mine (see the following footnote), the application of it to the constitution puzzles as presented in this chapter, and its connection to my defense of CI, is (as far as I am aware). Moreover, as far as I am aware, no one has defended this view as one we should take seriously, as I argue in this chapter that we should. So this is what I mean when I say that the CI theorist can respond to constitution puzzles "in a novel way."

[7] See Weatherson, "Stages, Worms, Slices and Lumps" (MS) http://brian.weatherson.org/swsl.pdf. To my knowledge, he is the first to coin the phrase 'lump theory' to the view I will be endorsing in this chapter, although he attributes this view to Kaplan (1979), which is a paper that was first presented in 1967.

Objection, thus completing our comprehensive defense of CI. I will dedicate

Chapter 5 to discussing some advantages of CI—advantages that alternative

views of composition do not enjoy.

2. Composition and Constitution: Deflating the Difference

Some maintain that there is a difference between composition and

constitution. Of those who maintain this difference, there are some who do so

merely by stipulation, and those who do so because they believe there is a

principled difference. Wiggins, Rea, and Thompson, for example, all treat the

puzzles of constitution as distinct from puzzles of composition, without much

justification. [8] It is by way of example, and by the way that the puzzles have been

taxonomized in contemporary literature, that one might conclude that

composition and constitution are two difference relations. Sider (2007), on the

other hand, explicitly maintains that the difference between composition and

constitution is a principled one—the composition relation is many-one, whereas

the constitution relation is one-one.[9]

I think that either of these ways of distinguishing composition and

constitution—by way of mere conventional stipulation, or in terms of the whether

the relata are many-one or one-one—are inadequate means by which to

distinguish composition and constitution.

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[8] Wiggins (1968), Rea (1995), Thompson (1998). Also: Winston, et. al. (1987), Iris, et. al. (1988), and Gristl and Pribbenow (1995).

[9] Sider (2007:55, ftnt 14)

To see this, it will first behoove us to note that throughout the literature on the metaphysics of objects, it seems to be a matter of convention and trend, and not of kind, which puzzles get labeled constitution puzzles rather than composition. Wiggins, Rea, and Thompson, for example, all seem to think that certain puzzles are of one kind rather than another, simply in virtue of the fact that they classify certain puzzles (such as Goliath and Lumpl and Tib and Tibbles) as puzzles of constitution, not of composition.[10]

But this is only a recent trend, and not a consistently recent one at that. Aristotle (Metaphysics, Δ, 1023b), for example, seems to have collapsed composition and constitution puzzles into one category: puzzles about parthood.[11] Or, if he did think that there was a difference, it was not a very significant one. He claims [1041b10-15]:

> "In the same way that an aggregate of parts does not make up a single being, nor do quantities of matter by themselves constitute something. Just as a syllable is more than the aggregate of letters, so is flesh something more than fire and earth."

Now, true, in this passage Aristotle is endorsing a view that is a clear denial of CI. But the point is that he is treating composition ("…an aggregate of parts does not make up a single being…") and constitution ("…nor do quantities of matter by themselves constitute something.") as analogous relations. In fact, earlier Aristotle formulates a question akin to van Inwagen's Special Composition Question, but in terms of constitution. Recall that van Inwagen's Special Composition Question is: when is it the case that some parts, the *p*s, *compose* a

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[10] Wiggins (1968), Rea (1995), Thompson (1998).

[11] Aristotle (Metaphysics, Δ, 1023b).

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whole?[12] Aristotle, on the other hand, asks: when is it the case that some quantity of matter, *m*, *constitutes* a unified thing.[13] If these are different questions according to Aristotle, they do not differ by much, and they receive the same answer: some parts, such as flour, eggs and sugar, or some matter, such as a lump of clay, compose or constitute an object when they share "in one form."[14] And while Aristotle's *answer* to the question(s) is not entirely relevant here, what is important is that he gives the same answer to both, indicating that he thought that composition and constitution were very similar—if not the same—relation.

Moreover, in the contemporary literature, puzzles such as Tib and Tibbles (explained below) are classified as puzzles of constitution by some, but puzzles of composition by others. Van Inwagen (1990), for example, uses a variation of the Tib and Tibbles puzzle to argue against the Doctrine of Arbitrary Undetached Parts, and to support his eliminative view of *composition*. That is, he treats a (purported) puzzle of constitution as a puzzle of composition, and draws a radical thesis about the composition relation (namely, that there isn't any such thing) from it.[15] Heller (1984) uses a similar puzzle to argue for his four-dimensional view of objects, where objects are composed of parts, both spatial and temporal. Thus, he—like van Inwagen—treats a (purported) puzzle of constitution as a

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[12] Peter van Inwagen, *Material Beings*, p. 30.

[13] Metaphysics 1041b1-10.

[14] Aristotle, *ibid.*

[15] Peter van Inwagen, *Material Beings*.

puzzle of composition, and draws a radical thesis about objects (namely, that there aren't any) from it.[16]

So, often in the literature, while puzzles of constitution are sometimes treated separately from puzzles of composition, no justification is given for doing so; the difference between composition and constitution is presupposed but never explained. Moreover, the presupposed taxonomy is not even consistently uniform throughout the literature, both in the past and in contemporary literature. So if the only reason we have for thinking that there is a distinction between composition and constitution is mere precedence in the literature of making said distinction, and if such precedence is not even consistently uniform, then this undercuts the motivation for thinking that there is a distinction in the first place. Our default position should be that we only make distinctions when we have adequate reasons for doing so; otherwise, we might wind up positing distinct relations willy-nilly, violating our theoretical principles.[17]

Second, as we shall see below, all of the puzzles of constitution can be adequately recast as puzzles about composition. For every puzzle that we give that is purportedly a puzzle of constitution, as opposed to composition, (e.g., Goliath and Lumpl), I will show how we can easily recast it, without loss of metaphysical significance, as a puzzle about composition, even without assuming that CI is true. If this is right, then this will also weaken support for the claim that composition and constitution are distinct relations.

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[16] Mark Heller, "Temporal Parts of Four-Dimensional Objects."

[17] See Chapter 1, section 5.

Third, let us address the claim that the difference between composition and constitution is a principled one—e.g., that composition is a many-one relation while constitution is a one-one relation. This claim can be doubted for at least two reasons, one of which is independent from the truth of CI, one of which is not. First, many of the puzzles that are traditionally hailed as puzzles of material constitution are puzzles about many-one relations (e.g., the Marriage Paradox, the Ship of Theseus, Wiggins' tree and cellulose example, all of which will be discussed below). And some puzzles that are traditionally hailed as composition puzzles are concerned with one-one relations (e.g., Unger and van Inwagen's discussion of the Body/Body-minus puzzle). This is a separate point from the one made above: it isn't just the fact that certain puzzles of constitution have been inconsistently treated as puzzles of composition, and vice versa; it isn't a matter of inconsistent, stipulated taxonomy. Rather, it's the idea that *given* the presumed principled difference—e.g., that composition is a many-one relation, whereas constitution is one-one—that even this difference is not honored by the literature.

Michael Rea, for example, in his introduction to *Material Constitution: A Reader*, claims that what is in common with all puzzles of constitution is that "…all of them present us with scenarios in which it appears that an object *a* and an object *b* share all of the same parts but are essentially related to their parts in different ways."[18] This seems to suggest that puzzles of constitution involve a *combination* of many-one relations and one-one relations. On the one hand,

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[18] Michael C. Rea (1997: xvi).

there is the relation between an object *a* and its parts, and an object *b* and its parts (which are both many-one relations), and on the other there is the relation between *a* and *b* (which is one-one).[19] Distinguishing composition and constitution in terms of many-one or one-one relations, then, is simply not supported by past or contemporary literature. And if such a principled difference is not supported by the literature, and there is furthermore no independent argument for it, then we lack sufficient reason to think that the principled difference should be upheld. Grounding a distinction in a principle is unhelpful if the principle itself is unsupported.

Yet, second, even if such a distinction *was* supported by the literature, someone who endorses CI should not (and maybe even cannot) embrace such a distinction. Suppose composition is a one-many relation, suppose constitution is a one-one relation, and suppose CI is true. Suppose also that we have a lump of clay that is *composed* of many clay particles (one-many), and a statue that is *constituted* by the lump of clay (one-one). CI claims that the relation between the lump of clay and the clay particles is identity; so the lump of clay *is* the clay particles. By the substitutivity of identity, the statue is constituted by the clay particles, which is a one-many relationship. So, by the supposition that composition is one-many, the statue is composed of the clay particles; thus, the

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[19] As Rea later explains, just what this relation is between *a* and *b* is up for debate. Some think that the relation between *a* and *b* has to be one of identity (since no two distinct objects can share all of the same parts, e.g.); others think that *a* and *b* are distinct. But whether one thinks *a* and *b* are identical or not, the fact remains that the relation between them—whatever it is—still a one-one relation.

statue is identical to the clay particles.[20] So a CI theorist should not (and maybe

even cannot) rest on the difference between composition and constitution as a

difference between the relata being one-many or one-one.

Of course, one might think that all of this will lead to pretty counterintuitive

results. First, if composition is identity, then it seems we are committed to

claiming that all objects have their parts necessarily. Second, if composition and

constitution collapse into the same relation—i.e., identity—then it seems we must

not only say that all objects have their parts necessarily, but that (e.g.) statues

and lumps have the same modal properties. So we will be committed to claiming

such absurdities as (e.g.) a statue could survive being molded into an ashtray, or

a lump of clay couldn't survive being so-molded; or: a statue couldn't survive a

replacement of parts, or a lump could, etc. The absurdity of such claims is a large

part of what's motivating the constitution puzzles that I will discuss in detail

below.

To see the first point (i.e., that if CI is true, then all objects have their parts

necessarily) recall that a classical mereologist is committed to the following

axioms: [21]

Transitivity: If x is part of y, and z is part x, then z is part of y.

Uniqueness: If something, x, is a fusion of some things, y_1, …, y_n, and
                 something, z, is also a fusion of the y_is, then $x = z$.

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[20] I will have more to say about this particular example below, in the course of detailing the puzzles.

[21] See Lewis (1991), Yi (1999), McKay (2006), et. al.; this is discussed briefly in Chapter 1 of this thesis.

Universality: If there are some things, x_1, …, x_n, then there is something, x, that is a fusion of the x_is.

And let us suppose that we have a cat in front of us that is composed of a head, h, a body, b, and a tail, t. According to Universality, there is a fusion, f, that is composed of h, b, and t. According to CI, $f =_h h$, b, t. Given the Indiscernibility of Identicals, if $f =_h h$, b, t, then there is no world where f exists and h, b, and t do not; so f has as parts h, b, and t, in every possible world, hence, f has as parts h, b, and t, necessarily. Thus, if $f =_h h$, b, t, then necessarily $f =_h h$, b, t. And similar reasoning will apply to any object whatsoever, if CI is true. But then this is just to embrace mereological essentialism:

Mereological Essentialism: all objects have their parts necessarily.[22]

And mereological essentialism, while exciting for some, is wildly implausible for many.

For starters, mereological essentialism just *seems* flat-out false. We tend to think, most of us, that ordinary objects can lose (at least) small parts over time. Take my office desk, for example. Every day I come into my office and sit at my desk. I have been sitting at it and reading by it and putting books on it and spilling coffee on it for over four years. And never once have I thought, as I walked into

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[22] One might want to claim that there is a difference between an object having its parts *necessarily* and an object having its parts *essentially*. I don't quite feel the pull to make such a distinction, but I do not want to get into this issue here. As we will see below, we can cash out the definition of Mereological Essentialism using world-talk, thus eliminating having to choose between talk about *having parts necessarily* or *having parts essentially*. I hope this will mitigate worries about the difference (if there is one) between necessary parts and essential parts. Also, I hope that such a worry won't interrupt the fact that I have chosen to call the position whereby all objects have their parts *necessarily* ,"Mereological *Essentialism*." I have done this to maintain consistency with terminology already in use in the literature.

my office, "Hey! Where the flip did my desk go?" This is because I think that my

desk has remained *my* desk over these four years. Sure, I will admit that small

portions of it have probably flaked off—tiny molecules get bumped off of it when I

brush against it, or when I have to wipe off the spilled coffee, etc. I can admit that

my desk has undergone some small changes, and that it has lost some of its

original parts. But it is still my desk! And I am not alone: other people think my

desk is still my desk, even after all these years, and all the loss of its various

(small) parts. And my *desk* is not alone: other people think that *lots* of ordinary

objects are the same objects over time and over change. Yet if mereological

essentialism is true, then our ordinary intuitions are wildly false. But if this is right,

some may argue, then so much the worse for mereological essentialism, and any

view which entails it.

In fact, some have explicitly used mereological essentialism as a direct

modus tollens against CI. Trenton Merricks, for example, argues that CI entails

mereological essentialism, so if one rejects mereological essentialism, then one

should reject CI. The implication is that mereological essentialism is such a

radical view, that any view—such as CI—which entails it, should be rejected.[23]

Van Inwagen also thinks that a commitment to CI carries with it a commitment to

(something very close to) mereological essentialism, and that this gives us

reason enough to abandon CI.[24] Actually, to be a bit more careful: Van Inwagen

thinks that a commitment to Universal Composition (universality) carries with it a

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[23] Trenton Merricks, "Composition as identity, mereological essentialism, and counterpart theory" in Australasian Journal of Philosophy, Vol. 77, No. 2, pp. 192-195; June 1999.

[24] See van Inwagen (1981).

commitment to something like mereological essentialism; he doesn't specifically talk about CI. But since a commitment to Universal Composition is assumed by my account of CI, his argument will apply to CI (as I'm defending her here).[25] The important issue, however, is to note that mereological essentialism is often seen as a reason to *reject* CI.

Yet I propose to modus ponens the above sorts of arguments. In what follows, I will argue that mereological essentialism can (and should!) be embraced. I will begin by showing that we already have a commonsense, liberal view about 'parthood,' which will be the first step in accepting mereological essentialism. Then I will endorse a "lump" theory of objects, or 5-dimensionalism: the view that objects are extended spatially, temporally, *and* modally. As we shall see, this move, despite its initial counter-intuitiveness in some ways, is actually amenable to some of our ordinary intuitions about objects in others. Moreover, such a view has the added benefit of providing elegant and novel solutions to the traditional puzzles of constitution.

Before launching into these views, however, let us first take a look at four of the traditional puzzles of constitution. As I do so, I will re-emphasize the points made in this section—namely, that we have little (or no) reason to think that composition and constitution are distinct relations.

3. **Four Puzzles of (Material) Constitution**

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[25] See Chapter 1 section 5.

3.1   *The Marriage Paradox*[26]

Suppose you have finally decided to marry the love of your life. The two of you exchange vows and promise to be together forever. However, seven years later you come home and find the closets empty of your spouse's belongings, some suitcases missing, and the following note propped up on the bedroom bureau:

> "As we both know, human beings are made up of a collection of skin and bones and tissue and veins and millions and millions of atoms and particles. When we made our marriage vows, there were two distinct collections of particles exchanging vows. However, over the last seven years, those particles have changed: bits of tissue and skin have been replaced by new bits of tissue and skin. In fact, there is not a single particle that makes up me now that is identical with any of the particles that made up the collection of particles that made a promise to you at the alter. Therefore, since the particles that make up me now are entirely distinct from the ones that married you, I am a different human being from the one who married you. Since we are not married, I am out of here. Good-bye."[27]

Understandably, you are heartbroken. But, more importantly, you are feeling duped. Surely *something* must be wrong with the above line of reasoning (otherwise divorce proceedings would be a much swifter process and there would be no need for expensive divorce lawyers). But where did your spouse's reasoning go awry?

Let us discuss a couple of assumptions at play in this puzzle. First, it presupposes the Existence Assumption (EA)—i.e., it assumes that objects such

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[26] Another version of this puzzle is called the Debtor's Paradox, where a borrower can weasel his way out of a debt (and a lender can likewise dodge culpability for the debtor's soon-to-be black eye!). See, e.g., Rea (1997).

[27] Example modified from Rea (1997), Introduction.

as people, or human beings, *exist.* Second, it presupposes the Parthood

Assumption (PA)—i.e., it assumes that people or human beings are made of

parts, such as bits of molecules and cells and material particles.[28] Moreover, in

this particular formulation of the puzzle, it assumes that human beings are

entirely made up of material parts; there are no souls, for example.[29] It also

assumes that a human can gain and lose some of its material parts, that they can

survive or endure through time, but that they cannot lose all of their parts and still

remain the same object. Finally, the above puzzle appeals to the Indiscernibility

of Identicals: it compares the properties of a collection of molecules at one time

(the molecules at the time of the exchange of marriage vows) to the properties of

a collection of molecules at a later time (the collection of molecules that is writing

the note, seven years after the wedding). Since the collection of molecules at one

time differs from the collection of molecules at a later time, then by the

Indiscernibility of Identicals, the collections are not identical. Thus, the collection

of molecules that was standing at the altar is not identical to the one writing the

letter 7 years later.

Before moving on to the other puzzles, it is interesting to note that this

puzzle is often hailed (in contemporary literature) as a puzzle of constitution, not

of composition, even though the relation between the molecules and the human

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[28] See Chapter 1, section 5 for further elaboration on these assumptions. As discussed earlier, both of these are assumptions that some philosophers have denied (Unger, van Inwagen, etc.) but I will not be denying them here.

[29] Indeed, positing souls may be one way out of this puzzle. However, I suspect the puzzle may be recast at the levels of souls, depending on whether one thinks that souls have parts or not (psychological parts, perhaps?). And notice that an appeal to souls to solve this puzzle won't generalize to other versions of this puzzle, e.g. Ship of Theseus, or any puzzle that involves a soulless object, for example.

being is clearly a many-one relation—i.e., the molecules are many, the human being is one. So this is a fine example of where the stipulated taxonomy pulls apart from a more (purported) principled difference between the constitution relation and the composition relation.

Moreover, notice that we can easily recast this puzzle as one explicitly about composition. The puzzle was stated above using the *made up of* relation—one that I believe is neutral between composition and constitution (which we should predict anyway, if it turns out that composition and constitution are the same relation).[30] But notice that absolutely nothing is lost if we were to phrase the puzzle explicitly in terms of the composition relation. We could have easily begun the puzzle as follows: "human beings are *composed of* skin and bones and tissue and veins and millions and millions of atoms and particles," etc. The entire puzzle, in other words, could be rephrased as one about people being *composed* of certain parts, or being *constituted* by certain parts, rather than people being *made up of* certain parts, and the same contradictory conclusion would result. If we can generate the same puzzle using either 'composition', 'constitution', or 'made up of', without any significant loss of meaning, then this should weaken our motivations for thinking that the composition and constitution relation are distinct relations.

3.2   The Ship of Theseus

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[30] Also, see Chapter 2, where I propose a counting exercise where we consider some objects that are *made up of* others.

Imagine that there is ship that is made up of just 100 planks of wood, a sail and a mast.[31] In the year 1800, the ship goes out to sea. In an effort to maintain a maximally seaworthy ship, however, the following restoration procedure takes place: every year just one of the planks will be replaced, and then the sail, and then the mask, so that in the year 1902, all of the 102 parts that make up the ship have (gradually) been replaced. Let us call the original ship that left port in 1800, ship A. Let us call the ship that pulls into port in 1902, ship B. And let us ask ourselves the following question: Is ship A identical to ship B?

Here are some reasons why you might think ship A is identical to ship B: first, we tend to think that objects can survive the loss of some of its parts. We tend to have a tolerance, for instance, for small changes over time. We do not think that the loss of one small part of an object results in a loss of that object. If we did, then that would mean that every time a speck of wood flaked off of your desk, or a molecule flaked off of *you*, then your desk and you would thereby cease to exist. So we tend to think that in the case of the Ship of Theseus, our tolerance for small changes will eventually lead us to identify ship B with ship A.

Second, we can imagine that all of the people aboard the ship in 1800, when it sails out to sea, *stay* aboard the ship. We can imagine that these (unusually long-living) sailors never leave the ship, that they say things like "I'm so tired of being on this dang ship" and "How much longer are we going to be sailing on this blasted ship, anyway?", etc. Never do they wake up and think they are on a different ship; the changes in the boards every year has not inclined

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[31] This puzzle is discussed in: Plutarch, *Life of Theseus*, Hobbes (*De Corpore*, II, 7, 2), Rea (1995), Rea (1997), Wiggins (1967), Parfit (1984), Nozick (1982), Kripke (1980), Gallois (1986), (1988), Carter (1987), Chandler (1975), Griffin (1977), Bakker (2002), etc.

them to think that their ship has popped out of existence and a new one has popped up in its place. So, we might conclude, ship A is identical to ship B.

Yet a complication arises when we discover that the discarded boards (and mast and sail) have been collected and assembled over the years.[32] In 1902, then, there is a ship—call it ship C—that is qualitatively identical to ship A, and indeed is made up of all of the original boards (and mast and sail) that ship A was made up of. So now the question before us is: Is ship A identical to ship C?

Here's why we might think so. Ship A and ship C have all of the same parts! There is not any part that ship A had that ship C does not now have. All of the parts are arranged in exactly the same way. There seems to be no difference-making feature that would distinguish ship A from C. So, ship A must be identical to ship C.

But if ship A is identical to ship B (by our first line of reasoning), and ship A is identical to ship C (by our second line of reasoning), then it follows by the transitivity of identity that ship B is identical to ship C. But ship B cannot be identical to ship C, since B and C are clearly *two* ships not *one* (we can imagine them side by side at port, say). Thus, unless we want to endorse some strange metaphysical view whereby a single object can occupy two places at the same time,[33] we cannot claim that B is identical to C. So then one of our above lines of reasoning has gone wrong.

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[32] This complication in the puzzle was first discussed by Hobbes (*De Corpore*, II, 7, 2). For contemporary discussions of this puzzle, see Simons (1987), Wiggins (1968), et. al.

[33] See O'Leary-Hawthorne (1995) "The Bundle Theory of Substances and the Identity of Indiscernibles", and Zimmerman (1997) "Disctinct Indiscernibles and the Bundle Theory," for discussions of bi-located objects.

Notice the parallel between this puzzle and the Marriage Paradox—both of these puzzles are about one thing (a ship or a person) and the parts (boards or molecules) that make them up. As such, both are about a many-one relation, and both should qualify as composition puzzles according to (e.g.) Sider's distinction between composition and constitution. Yet they are not treated consistently as such in the literature. Rea (1997), for example, labels both of these puzzles as puzzles of constitution, not composition. Also, notice that like the Marriage Paradox, the Ship of Theseus puzzle could be easily be recast explicitly as a puzzle about composition simply by making it explicit what the "made up of" relation is. Instead of beginning the argument with a premise such as "imagine a ship that is *made up of* 100 boards, a mast, and a sail, etc.," we could have said: "imagine a ship that is *composed of* 100 boards, a mast, and a sail, etc.," without affecting the puzzle in the least. Or we could have said that the ship was *constituted by* 100 boards, a mast, and a sail, etc. and the puzzle would still be just as puzzling. If the puzzle doesn't change when we swap in 'composed of'' for 'constituted by', or 'constituted by' for 'made up of', etc., then this is some reason to think that these terms are synonymous.

Now, true, there are two seemingly important differences between the Marriage Paradox and the Ship of Theseus. First, the Marriage Paradox involves the identity of people, whereas the Ship of Theseus involves the identity of ships. And one might—and in fact many philosophers do—think that there are significant, metaphysical differences between human beings and ships. Human beings, for example, might have minds, or souls, whereas ships do not. Or

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human beings might be *alive*, whereas ships are not, which might make all the difference, metaphysically speaking.[34] Second, in the Ship of Theseus puzzle, we have the added complication of having a competitor for identity. We have ship C, the ship that was reassembled from ship A's original parts. One might not think that having a competitor would change the metaphysical facts of the case—if we want to know whether x = y, then x and y are important for our query, but it certainly doesn't matter what the rest of the world is doing!—but others have maintained that it does.[35] So while there are noted similarities between the Marriage Paradox and the Ship of Theseus, there are some differences as well, but none these will affect my claim that constitution and composition are the same relation, or my bigger claim that CI is true.

3.3   *Tib and Tibbles*[36]

Imagine that we have a cat named Tibbles who is a regular looking and ordinary cat. When we meet him one morning, at t_1, Tibbles looks like a regular cat should, with legs, paws, whiskers, and tail, etc. Shortly after t_1, Tibbles steps outside and goes about his normal cat-like business. Unfortunately, a terrible tragedy befalls Tibbles when he gets too close to a lawnmower. At night, t_2, he

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[34] Indeed, this is the line that van Inwagen takes in *Material Beings*. He claims that it is only when something is a living thing that composition occurs. So, for example, the Ship of Theseus is just a bunch of simples arranged ship-wise, but a person can be composed of parts, since composition only occurs when the composed thing is a *living* thing.

[35] See, for example, R. M. Gale (1984) in Wiggins' Thesis (x), *Philosophical Studies*, Nathan Salmon (1982), *Reference and Essence*, R. Nozick (1981), *Philosophical Explanations*, Noonan (1985) in *Analysis* Vol. 45, No. 1, pp. 4-8.

[36] Another version of this puzzle is called 'Body/Body-minus.'

comes back indoors as a tail-less cat. Let us name the name the part of Tibbles

that came back—all of Tibbles *minus* his tail—Tib. Now at t_1, it seems that both

Tibbles and Tib exist. After all, we could easily paint Tib purple, and see that

Tibbles is partly painted purple, while his tail is unsullied. Moreover, it seems

clear that Tibbles at t_1 ≠ Tib at t_1. For Tibbles at t_1 has a tail but Tib at t_1 doesn't

(in fact, by definition, Tib *never* has a tail), so by the Indiscernibility of Identicals,

Tibbles at t_1 ≠ Tib at t_1. But at t_2, Tibbles does not have a tail, and Tib doesn't

either. So what, then, is the difference between Tibbles at t_2 and Tib at t_2? If you

say nothing, then by the Identity of Indiscernibles, we will have to claim that

Tibbles at t_2 = Tib at t_2. But then we will get into trouble by the transitivity of

identity. For presumably, Tibbles did not go out of existence from t_1 to t_2—i.e.,

Tibbles at t_1 = Tibbles at t_2. But Tib did not go out of existence either, for nothing

happened to Tib at all! So Tib at t_1 = Tib at t_2. But then we arrive at a

contradiction. To see this:

1. **Tibbles at t_1 = Tibbles at t_2** (By commonsense intuition: we don't think that cats go out of existence when they lose their tails).

2. **Tib at t_1 = Tib at t_2** (Nothing happened to Tib at all!)

3. **Tibbles at t_1 ≠ Tib at t_1** (By LL: one has a tail and the other doesn't).

4. **Tibbles at t_2 = Tib at t_2** (Every region occupied by Tibbles is occupied by Tib; "they" have no difference-making feature).

5. **Tibbles at t_1 = Tib at t_2** (By 1, 4, Substitutivity of Identicals).

6. **Tibbles at t_1 = Tib at t_1** (By 5, 2, Substitutivity of Identicals).

7. **Tibbles at t_1 = Tib at t_1 & Tibbles at t_1 ≠ Tib at t_1** (3, 6, &I)

Notice that unlike the Marriage Paradox or the Ship of Theseus, this puzzle isn't

straightforwardly about some parts (e.g., boards or molecules) and the whole that

is composed of them (e.g., a ship or a person). The primary relation is not many-

one, in other words. Rather, it seems that this puzzle is concerned with a singular

thing, Tibbles, and another singular thing Tib. Or, more precisely, it is presumably

concerned with *four* singular things: Tibbles at t_1, Tib at t_1, Tibbles at t_2, and Tib

at t_2. Hence, we might be tempted to think that this is a constitution puzzle

because it is concerned with one-one relations rather than many-one relations, if

we thought that there was such a principled distinction between composition and

constitution.

But it is important that these singular things overlap, and hence, share

parts. In fact, van Inwagen uses a version of this puzzle to argue against a

mereological thesis, the Doctrine of Arbitrary Undetached Parts, or DAUP.[37]

> **DAUP**: For every material object, M, if R is the region of space occupied
> by M at time, *t*, and if sub-R is any occupiable sub-region of R *whatever*,
> there exists a material object that occupies the region sub-R at *t*.[38]

First, let us see why DAUP is intuitively appealing. Throughout this thesis, I have

been appealing to examples using ordinary objects and their undetached parts: a

cat and his body parts, a coin and it's front and back half, a circle and its top

third, its middle third, and its bottom third, my desk and its legs, drawers, top, and

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[37] Peter van Inwagen (1981) "The Doctrine of Arbitrary Undetached Parts," *Pacific Philosophical Quarterly* 62 (1981), pp. 123-37.

[38] This is van Inwagen's formulation. His letters "M" and "R" are not intended to be plural terms, predicates, or variables, in the way that I have used them from chapter 2 and onward.

all of its wood-particle bits, etc. Indeed, even to understand any of the four

puzzles described in this present chapter, it seems we presupposed that objects

have undetached parts: in the Marriage Paradox, we accept that people have

undetached molecules as parts; in the Ship of Theseus, we accept that ships

have undetached wooden planks as parts; in Tib and Tibbles, we accept that

cats have tails as undetached parts; and in Goliath and Lumpl (which will be

discussed below), in order to understand the purported modal differences

between Goliath and Lumpl, we accept that statues have (e.g.) arms as

undetached parts (Goliath could have lost an arm and survived, but Lumpl

couldn't have), and lumps of clay have undetached parts (e.g., Lumpl is made of

lots of undetached clay bits, all of which are essential to Lumpl's survival; in order

to understand that Lumpl's clay bits are essential to it, you first have to

presuppose that Lumpl has clay bits as parts to begin with, and all of these parts

are undetached).

So we have, at the very least, been implicitly assuming all along that

objects have undetached parts; it seemed natural and even un-noteworthy to

assume as much. To show that we think such undetached parts can be arbitrary,

consider any example where we can talk about the arbitrary right half and left half

of something—a pie, say.

Suppose we think that there is a right half and a left half of a piece of pie.

If we don't, then what an odd state of affairs seemingly occurs when we slice and

separate the pie straight down the middle: two brand-new objects pop into

existence! But this reasoning proliferates: if we think that a pie has a right half

and a left half, then we must surely think that there is a right half and left half to each of the *halves* of the pie. After all, we could take a knife to the already cut halves and halve the halves. If the halved halves didn't exist prior to the cutting, then they must have just popped into existence the moment we sliced the pie! To avoid such arbitrary poppings-in-(and-outs!) of objects, we should admit the halved halves already exist prior to the cut. And a right and left half of *those* halved halves exits as well, etc. Surely, any 'half' we think exists for a pie, goes similarly for any pieces of the pie, original halves included, and so on down to the smallest extended piece of the pie.[39]

So if it is natural and intuitive to think that there are arbitrary right halves and left halves—or top halves and bottom halves—of bulky (material) items like pies and people and ships and statues, then it is similarly natural and intuitive to think that there are right halves and left halves—and top halves and bottom halves—of the halves of those objects. But, on pain of having an implausible and arbitrary cut-off point to the halves of (material) objects that exist, it looks as if we must accept that every extended (material) object has (at least) a right half and a left half, or a top half and a bottom half, etc. But this just amounts to DAUP: For every material object, M, if R is the region of space occupied by M at time, *t*, and

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[39] Of course such reasoning can get us into trouble. Is there a smallest bit of pie? Are pies (and other objects) parts 'all the way down'? Is there a rock bottom—some bit of stuff that can't be halved? Is the world a simple one (i.e., it bottoms out in parts with no parts)? Or a gunky one (i.e., there parts all the way down)? I need not get into all of this right now. All I need for my purposes here is the admission that some objects have parts (whether that be the right half and left half, the top and bottom, etc.). What happens 'in the end' or 'at rock bottom' is a story I can leave open-ended for now.

if sub-R is any occupiable sub-region of R *whatever*, there exists a material

object that occupies the region sub-R at *t*.[40]

So we can now see why DAUP is intuitive. Second, however, let us take a

moment to appreciate how DAUP is related to composition: if one accepts DAUP

then one accepts that (material) objects have arbitrary, undetached *parts*. Of

course, the relation between a thing and its parts is that of *composition*. So any

objection to DAUP will be an objection to certain views of composition, since

DAUP is a thesis about what kind of parts material objects have (i.e., arbitrary

and undetached), and this will have a direct consequence for the composition

relation, and the question as to when (or whether) it holds between some parts

and a whole.

And, in fact, Van Inwagen uses a variation of the Tib and Tibbles puzzle to

argue *against* DAUP, and ultimately for a particular answer to the Special

Composition Question—

PvI's Special Composition Question: when do some *x*s compose an
object?

—namely, never.[41] Since DAUP is a thesis that a CI theorist (as I am imagining

her) will embrace, then we can take Van Inwagen's argument as an argument

against CI as well.[42]

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[40] DAUP commits us to the claim that there are no extended (material) simples (i.e., there are no extended, material, partless objects). I do not wish to get into the issue of whether there are or are not such things as extended simples, so let us just presuppose for now that there aren't. If after my discussion here, it is maintained that DAUP is false because there are extended simples, and not for the reasons Van Inwagen countenances, then I'd be happy to adjust the direction of the dialectic accordingly. For now, however, I am just interested in why van Inwagen thinks DAUP is false (namely, the Tib and Tibbles puzzle).

All of this is just to show, however, that Tib and Tibbles is not a puzzle about (merely) constitution; or, if it is, that this is not the only relation that the puzzle involves (assuming for the moment that composition and constitution relation are indeed distinct relations), since we can seemingly derive important conclusions about *composition* from the puzzle, as van Inwagen intends.

Furthermore, however, notice that we could easily rephrase the Tib and Tibbles puzzle in terms of many-one relations. Imagine (what is likely): that Tibbles is composed of millions of molecules. Tib, then, could be defined as some sub-set of those millions of particles, and we would be off and running with a puzzle explicitly involving composition, with no seemingly significant difference between the original presentation and the rephrased one. Thus, we see yet again that there is little support for a difference between the composition relation and the constitution relation.

3.4   *Goliath and Lumpl*[43]

Imagine that Sam the sculptor has decided to make a statue of Goliath out of clay. However, due to an odd superstition, Sam prefers to sculpt one half of the statue, and then the other, and then he puts them together after the halves are complete. So, on Day 1, he sculpts both the top half and the bottom half of

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[41] Cf. van Inwagen.

[42] See Chapter 1, section 5. In particular, recall that I am assuming (i) the Existence Assumption: that there are ordinary objects (tables, chairs, etc.) and (ii) the Parthood Assumption: that these objects have parts (front halves, back halves, etc.). If DAUP is false, then these assumptions are false (modulo the issue of extended, material, mereological simples, which I will ignore for the moment (see above, footnote 40)).

[43] The original presentation of this puzzle is found in Alan Gibbard (1975).

Goliath, from two separate lumps of clay. On Day 2, he sticks the two halves together and lets the statue harden. On Day 3, he realizes the endeavor was a complete failure, and takes a sledgehammer to the clay statue, smashing it to smithereens.

Suppose that *lumps* of clay are those bits of clay that are connected to other bits of clay, and that statues are what we ordinarily think they are—certain formations created to represent something and made of some kind of material like clay and bronze and what-not. Let us call the lump of clay that Goliath is made out of, *Lumpl*, and let us call the statue, *Goliath*. On Day 1, it seems that neither Lumpl nor Goliath exist. Yet on Day 2, it seems that Goliath and Lumpl come into existence at the same time. On Day 3, however, it seems they go out of existence at the same time (as soon as 'they' are smashed). So it would seem that both Lumpl and Goliath exist at the same place, at the same time, and for the same amount of time. But wait! Doesn't this violate an intuitive principle of ours, call this principle **S**?

> **S**: Two things cannot completely occupy exactly the same place or exactly the same volume (or exactly the same subvolumes within exactly the same volume) for exactly the same period of time.[44, 45]

"Well, perhaps," you think, "Lumpl and Goliath are identical. Then principle **S** would not be violated." Yet by the Indiscernibility of Identicals, it seems that

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[44] David Wiggins, "On Being in the Same Place at the Same Time," in *Philosophical Review* (1968); reprinted in Rea (1997)

[45] **S** isn't entirely correct. Even Wiggins himself (*ibid.*) goes through various different amendments on the principle. You might think that regions of space, or space-time points, etc., *are* things, for example, but clearly a material object and regions of space occupy the same place at the same time—indeed this seems to be what it means for an object to be at a certain place. But let us ignore these issues for now.

Lumpl and Goliath are distinct. For Lumpl has a property that Goliath doesn't

have: Lumpl *could* survive being smushed or rearranged, but Goliath *couldn't*.

And Goliath has a property that Lumpl doesn't have: Goliath *could* survive the

loss of a toe or an arm, say, but Lumpl *couldn't*. So by the Indiscernibility of

Identicals it seems that Lumpl and Goliath are distinct; yet then how could they

both be in the same place at the same time? Does this mean we should give up

principle **S**?[46]

This puzzle is traditionally hailed as the paradigm puzzle of constitution.

But notice that this is also a puzzle about composition, since we need to be able

to make sense of the composition relation to get on the grasp of the difference

between Goliath and Lumpl to get the puzzle off the ground. As explained above,

in accepting the puzzle, we accept that statues have (e.g.) arms as undetached

parts (Goliath could have lost an arm and survived, but Lumpl couldn't have), and

lumps of clay have undetached parts (e.g., Lumpl is made of lots of undetached

clay bits, all of which are essential to Lumpl's survival; in order to understand that

Lumpl's clay bits are essential to it, you first have to presuppose that Lumpl has

clay bits as parts to begin with, and all of these parts are undetached). Also, in

order to get the puzzle going, we had to imagine that there were two halves of

the statues (the top half and the bottom half), and two lumps of clay, that will

eventually make up Lumpl, in order to understand that both Goliath and Lumpl

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[46] Some think we should give up, or at least modify, principle S. See (e.g.) David Wiggins (1968).
Others think that we should give up something else: Merricks (2001) thinks this puzzle shows that
we should give up the Existence Assumption—i.e., he is an Eliminativist about ordinary objects
and denies that (e.g.) tables and chairs exist. Van Cleve (1986) and Zimmerman (1995) think that
we should reject the idea that objects lose their parts, and embrace mereological essentialism—
although not for the reasons that I do (discussed below). And so on.

came into existence at the same time. We would not be able to understand that

Goliath and Lumpl had overlapping temporal careers, an overlap of conception

and destruction, if we didn't grasp that there were *parts* of each that existed on

Day 1.[47] So, integral to the puzzle, is that Goliath and Lumpl involve issues of

composition as well as constitution (assuming for the moment that these are

indeed distinct relations).

Moreover, as I have mentioned before, since the CI theorist will claim, for

example, that the lump of clay is identical to the clay molecules that compose the

lump, then it is irrelevant whether the puzzle is formulated in terms of one-one

relations, or many-one. Suppose that we have a lump of clay that is *composed* of

many clay particles (one-many), and a statue that is *constituted* by the lump of

clay (one-one). CI claims that the relation between the lump of clay and the clay

particles is identity; so the lump of clay *is* the clay particles. By the substitutivity

of identity, the statue is constituted by the clay particles, which is a one-many

relationship. So, by the supposition that composition is one-many, the statue is

composed of the clay particles; thus, the statue is identical to the clay particles.[48]

So a CI theorist should not (and maybe even cannot) rest on the difference

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[47] One might think to object to me here: "Aha! Gotcha! You just admitted that the parts of Goliath and Lumpl existed on Day 1, yet admitted above (to get the puzzle going) that Golaith and Lumpl do *not* exist on Day 1. So doesn't that show that Goliath and Lumpl are not identical to the parts that compose them?" My answer to this objection is just the answer I will give to the Modal Objection, and to the constitution puzzles in general: it depends crucially on my metaphysics of objects, which I will detail in the work that follows. Also, as with many of these puzzles, the solutions involve the charge that the original set-up of the relevant puzzle is misleading in some way. Again, see below for more.

[48] I will have more to say about this particular example below, in the course of detailing the puzzles.

between composition and constitution as a difference between the relata being one-many or one-one.

I hope that at this point, one can easily see why the purported difference between composition and constitution is on shaky ground, especially if CI is true. Yet this should not lead us to think that the purported constitution puzzles are thereby unimportant; they are still (initially at least) problematic. Let us now see how a CI theorist will respond to them.

4. CI and Solving the Constitution Puzzles

4.1   *Does CI entail Mereological Essentialism?*

As mentioned at the outset, I think that the CI theorist has the resources available to adequately address the above four puzzles. However, some might think that this project is doomed from the start. This is because some might think that there is an obvious difference between my thesis—CI—and the puzzles I've laid out above. Namely, CI is a thesis about mereological sums and their parts, whereas all of the puzzles I discussed above are concerned with ordinary objects, not mereological sums. When it comes to mereology, in other words, CI may be true, but when it comes to ordinary objects, it is not.

Moreover, at this point, one might be wondering whether I have been overselling the merits of CI. I began this thesis with talk about ordinary objects; I continued this way of speaking in the chapters that followed. In fact, throughout this project I have been pumping intuitions using ordinary objects in our ordinary life. "The one deck is identical to 52 cards," I insisted. "The 52 cards are identical

to the one deck." I continued. "The table is made up of four legs, a top, and some drawer," I claimed, and then I tried my best to convince you that this 'made up of' relation was one of identity. I slipped easily from talk about ordinary objects that were 'made up of' other ordinary objects (e.g., that one dollar in your pocket is made up of four quarters, etc.), to abstract talk of parts and wholes. I brought in talk about mereology—the study of parts and wholes—and talked about why we might think that the mereological sum of any parts whatsoever is as much of an object as cats and mats and trees and rocks. In fact, the entire case for CI was built on the premise that, if we accept CI, mereology is ontologically innocent, and that, given some Quinean assumptions about ontological commitment and some traditional theoretical virtues (such as a commitment to parsimony, etc.), we could see that the relation between a mereological sum and its parts—the composition relation—is *really* one of identity.

But, you might be thinking, the relation between the parts of a mereological sum and that sum is one thing; the relation between the parts of an ordinary object and that ordinary object is another. The facts of mereology, in other words, whatever they may be, have no bearing on the facts of ordinary objects.

Mereological sums have their parts essentially, you might rightly point out, while ordinary objects, so we tend to think, do not. If one of the parts of a mereological sum goes out of existence, the mereological sum thereby goes out of existence. Not so with ordinary objects, so we tend to think. My running shoe could lose some flakes of plastic and bits of rubber or some of the tread could

wear off or some of the thread could fray away from the laces. But despite the loss of these parts, my running shoe is still my running shoe; the loss of various parts has not resulted in a loss of the object, my running shoe. Contrast: the mereological sum of all of the parts of my running shoe when it first came out of the box is no longer located where it used to be—many of the parts have scattered and flaked off the longer I've been wearing them, many of the parts used to be attached and now they are not, etc.—and if some of the parts of the mereological sum of the parts of my running shoe when it first came out of the box have been destroyed, then the mereological sum has thereby been destroyed as well.

So, you might be thinking, it is all fine and well that CI is true as far as *mereological sums* are concerned, but this has no bearing on the metaphysics of ordinary objects. And you might further think that I have been wasting your time. I have just spent many pages convincing you that CI is true, only to have this mean very little when it comes to the status of ordinary objects such as cats and mats and running shoes. And you might think that this point has been most poignantly highlighted by the foregoing constitution puzzles, which get their force from considering ordinary objects, not weird, theoretical objects such as mereological sums.

One *might* be tempted to separate one's views of mereological sums from ordinary objects, and to claim that CI is true only with respect to mereological sums. But I have two objections against such a move. First, someone who claims that CI is limited *only* to mereological sums, and *not* to ordinary objects, is simply

confused or mistaken about what the composition relation *is*. Second, it seems

that many who are tempted by such a view are driven to this position via an

argument similar to the one Merricks gives against CI.[49] I will lay out this

argument below and show where I think such an argument goes wrong. Let me

discuss the first point first, and then I'll discuss the Merricks-like argument

against CI.

Suppose someone wants to claim that CI holds for mereological sums but

not for ordinary objects. One of the problems with this position is that what has

been at issue is the *composition* relation, not the *relata* that this relation is held

between. It would be an odd view indeed if one were to say that the composition

relation is identity when it holds between a mereological sum and its parts, but

that this same(?!) relation is *not* identity when it holds between ordinary objects

such as cats and mats and running shoes, and all of their respective parts.

Now, true, one might claim that, strictly speaking, when *we*, qua

philosophers, use the word 'composition', this is a technical term that applies only

to the study of mereology, and to formal, theoretical objects such as mereological

sums. But, one might argue, this is not a relation that we ordinarily use when we

are talking about the relation of ordinary objects and their parts.

One might try to take this line, but I suspect it would crumble under

scrutiny. Mereology, as discussed by Lesniewski, Leonard and Goodman (1940),

Lewis (1991), Bigelow (1996), et. al., is supposed to be the study of *parts and*

wholes, intuitively and pre-theoretically understood. Indeed, Lewis reminds us

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[49] Cf. Merricks (1999)

that the notion of 'part' in mereology is an ideological primitive. Talk of what it is for one thing to be a *part* of another *does* follow from certain axioms and principles (e.g., transitivity, reflexivity, anti-symmetry, etc.), yet this is supposed to reflect our intuitive sense of what it is for one thing to be a part of another. And this intuitive sense we acquire from our knowledge of things in the world—from our knowledge of ordinary objects such as cats and mats and running shoes and how these objects relate to their respective parts. So given that mereology is a formalism that aims to *capture* our intuitive notions of parthood, born out of our pre-theoretical notion of parthood as it applies to ordinary objects, it would be odd to claim that 'composition' is then a purely formal notion that only applies to technical 'objects' such as mereological sums, but not to ordinary objects.

Also, for similar reasons, one could not plausibly maintain that 'composition' is ambiguous—that on the one hand it refers to the relation between a mereological sum and its parts, which is identity, and on the other it refers to the relation between ordinary objects and their parts, which is not identity. For given that mereology is supposed to be *capturing* the relation that's had between an ordinary object and its parts, then it would be unlikely (and unfortunate!) that 'composition' was ambiguous.

So it is implausible that there is one relation—composition—that behaves one way when its relata are mereological sums and their parts, and another when its relata are ordinary objects and their parts. And it is implausible that

there are two different relations that are confusingly both called 'composition.'

And our definitions of CI and ME reflect this well[50]:

Composition as Identity (CI): Any composite object, O, is (hybrid) identical with the objects $O_1, \ldots, O_n$ that are its parts; $O =_h O_1, \ldots, O_n$.

Mereological Essentialism (ME): Any composite object, O, is composed of (all and only) its parts $O_1, \ldots, O_n$, in every possible world in which O exists.

CI claims that so long as there is *any* composite object, O, that is made of (all and only) some parts, $O_1, \ldots, O_n$, then O is (hybrid) identical to $O_1, \ldots, O_n$. And ME claims that for *any* object O, which is composed of (all and only) its parts $O_1, \ldots, O_n$, O is composed of $O_1, \ldots, O_n$ in every possible world in which O exists. If any *composite* object will count, then it could not be the case that CI was true for mereological sums, but not true for ordinary objects. So long as the composition relation holds—whatever the relata happen to be—then CI claims that this relation is identity. And so I haven't been overselling the case for CI; all of my examples of ordinary objects to motivate CI throughout this thesis have not been misleading, for we are dealing in each case with some kind of mereological sum or other.

But one might still insist as follows. Never mind whether CI and ME are defined in seemingly compatible ways. The fact remains that mereological sums,

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[50] As noted previously, these definitions are borrowed and modified from Merricks (1999), "Composition as Identity, Mereological Essentialism, and Counterpart Theory", *Australasian Journal of Philosophy*, Vol. 77, No.2, pp. 192-195; June 1999. See Chapter 1, 2, and 3.

traditionally understood,[51] have all of their parts essentially, whereas ordinary objects do not. Therefore, ordinary objects cannot be identical to any mereological sum, and so mereological sums must be something different from ordinary objects.

My answer to this kind of objection is related to my response to Merricks' argument against CI. Trenton Merricks (1999) presents a seemingly compelling argument against CI, which I think many are tempted by. The first premise claims that CI entails mereological essentialism. As mentioned previously, he then concludes that since mereological essentialism is objectionable, CI is as well. I have already said why most people find ME objectionable: we intuitively think that objects *can* gain and lose (at least very small) parts! If ME is true, then no object would or could survive the loss of even its very smallest parts. And this would seemingly lead to a very wacky view of objects (e.g., objects would 'pop' out of existence every time they 'lost' a part, and a new one would 'pop' up in its place, etc.). And this, as mentioned above, is one of the reasons one might have for insisting that ordinary objects cannot be identical to mereological sums.

But let us first focus on his conditional claim that if CI is true, then mereological essentialism follows. If he is right, then this gives us yet another reason why one cannot think that CI is true for mereological sums, but not true for ordinary objects. Then I will address where I think the CI theorist should resist his argument.

Recall again the above definitions of CI and ME:

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[51] I say traditionally: it is usually assumed mereological sums do have their parts essentially. This assumption has been challenged, offering up a looser notion of 'mereological sum'—one which does not carry with it part essentialism. See Sider (?), e.g.

Composition as Identity (CI): Any composite object, O, is (hybrid) identical with the objects $O_1, \ldots, O_n$ that are its parts; $O =_h O_1, \ldots, O_n$.

Mereological Essentialism (ME): Any composite object, O, is composed of (all and only) its parts $O_1, \ldots, O_n$, in every possible world in which O exists.

To show that CI entails ME, Trenton Merricks gives the following argument:

"…suppose that O, the object composed of $O_1 \ldots O_n$, is identical with $O_1 \ldots O_n$. From this, the fact that $O_1 \ldots O_n$ are identical with $O_l \ldots O_n$ in every possible world, and the indiscernibility of identicals it follows that O is identical with $O_l \ldots O_n$ in every possible world) Therefore, if composition as identity is true, there is no world in which O exists but is not composed of $O_1 \ldots O_n$. So composition as identity implies that O—and, of course, every other composite object—must, in every world in which it exists, be composed of the parts that actually compose it. Composition as identity entails mereological essentialism." [1999:192-1]

The idea seems pretty straightforward. If we have already committed to CI, as formulated above, then we think that any composite object is (hybrid) identical to its parts. But if a composite object is identical to its parts, then by the Indiscernibility of Identicals,[52] there is no world where the composite object exists and its (actual) parts do not.

Of course, one way to resist this move is to deny the Indiscernibility of Identicals. As mentioned in previous chapters, this is the move that Donald Baxter makes. Also, if one maintains a Weak Composition Thesis, as Lewis does (1991), then one might think that composition is *analogous* to identity, but not *strictly* identity, and that one of the (few?) differences between composition and identity would be that the latter obeys the Indiscernibility of Identicals while the

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[52] One could also use the Necessity of Identity here to arrive at the same conclusion.

former does not. And so, on this view, one might endorse a version of CI (as stated above) but wriggle out of Merricks' argument, since the relation held between a composite object and its parts, while a *kind* of identity, does not obey the Indiscernibility of Identicals. Thus, one could—in letter but not in spirit—maintain CI but deny ME. But since I have already given my reasons for rejecting these two views,[53] let us move on.[54]

Trenton Merricks gives us a succinct argument against CI: a direct modus tollens against the view. And I actually *agree* with his first premise that CI *does* entail ME. Moreover—and this may be surprising—I think it *should*. That is, I think it is a good thing that it does. So, rather than resist Merrick's argument that CI entails ME, I will resist his claim that ME is a view that should be rejected. His modus tollens is my modus ponens. Moreover, going back to the line of reasoning that claims that ordinary objects cannot be identical to mereological sums because ordinary objects do not have their parts essentially, but mereological sums do, I am going pursue the line that, yes, ordinary objects *do* have their parts essentially. In other words, my response to both arguments will be a full defense of Mereological Essentialism. Once I show how ME can and should be embraced, then I will show how this view, together with CI, can solve the puzzles that were raised earlier in this chapter. Once that is completed, we

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[53] See Chapter 1.

[54] Another way to resist Merricks' argument is to insist that something has gone awry. See Ross Cameron (2007) "The Contingency of Composition." Unfortunately, I do not have the space here to discuss Cameron's objection to Merricks' argument; I will be assuming that Merricks' argument is problem-free.

will then come full circle and see how CI can successfully defend herself against

the Modal Objection.

4.2   Embracing Mereological Essentialism: the Lump Theory

I am going to try to convince you in the pages that follow that Mereological

Essentialism is true *and* intuitive. I am going to do so by easing you in toe-first,

little by little. Our first step in being so convinced will be to remind ourselves all of

the many ways that we talk about some thing(s) being *part of* some other(s). This

is supposed to be intuitive and commonsensical; I am relying on our pre-

theoretical judgments for now. (We will get to the unintuitive, non-

commonsensical, and post-theoretical bits in a moment.) Consider the following

perfectly acceptable sentences:

> (1) Nacho's tail is a part of him.
> (2) Those pieces are part of the puzzle.
> (3) This is the part when the girl turns into a vampire. [Said during a
>   movie]
> (4) Genocide is a very dark part of history.
> (5) Adolescence was a depressing part of my life.
> (6) The ability to love is the better part of humanity.
> (7) Knowing that she could run the marathon is part of what motivated the
>   girl to actually run it.
> (8) God's foreknowledge is part of his omniscience.
> (9) Trigonometry is part of mathematics.[55]

Up until this part of the thesis, I have been primarily concerned with material

parts. I have talked about cards and cats and running shoes and all kinds of

(material) parts and wholes. And it's true that we do talk about material parts in

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[55] Sentences (1)-(7) are modified from Varzi (2009); (8) and (9) are borrowed from Lewis (1991).
See also L. A. Paul (2002) "Logical Parts," in *Nous* 36:4.

the way that I talked about them throughout this thesis, as well as sentences (1)

and (2) above. But although (1) and (2) are both about material things, notice that

there is a difference—tails are attached or connected parts, while puzzle pieces

are often detached, or at least detach*able*, or disconnected, or disconnect*able*.

We talked briefly (in Chapter 1) about the difference between connected parts

and disconnected (or scattered) parts;[56] (1) and (2) are just two more examples.

So we've been in agreement with this up until now: parts are material, and they

can be attached or unattached, as is evidenced by the acceptable (1) and (2).

But it also seems that we can talk about parts of an event or parts of a

story, as in (3); we can talk about temporal parts, of history or of individuals, as in

(4) and (5); we can talk about the parts of a natural kind or group, as in (6); we

can talk about the parts of motivation or causal chains, even if these are modal in

nature, as in (7); and we can talk about the parts of features or attributes or fields

of study, as in (8) and (9). [57] And notice in each of these cases, (3)-(9), one

might have particular metaphysical views that imply that the relevant parts in

each case are immaterial. One might, for example, be an immaterialist when it

comes to events or fictions; or one might think that temporal properties (of history

or individuals) are abstract; or one might think that natural kinds or categories are

lodged somewhere in Plato's heaven; or one might think that motivating reasons

are somehow non-physical—perhaps some sort of dualism is true; or that

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[56] And we will talk even more about this in Chapter 5.

[57] Varzi (2009).

properties, attributes, and fields of mathematical studies are abstract, sets of certain individuals, etc.

I am not going to argue here that any of these above kinds of things *need* be immaterial; in fact, I want to remain decidedly neutral on ontology *except* for the thesis that composition is identity (for now). And this is as it should be. Our views of composition and mereology should be silent about whether the world is a material world or not.[58] Mereology is concerned with the study of parts and whole, *whatever* those parts and wholes may be. So if Berkeley is right, and the world is an Idealist one, then my claims about composition will still hold; if Hume is right, and the world is a materialist one, then my claims about composition will still hold. So, no matter what one's ontological views about what there is, so long as it is admitted that there are some thing(s) and these things have parts (i.e., the Existence Assumption and the Parthood Assumption), CI will still hold.

What this means, however, and what I think the above examples (1)-(9) show, is that we *already* have a very liberal understanding about what kinds of things count *as parts*. We may have only used examples such as (1) and (2)—examples where the relevant parts and whole are material and spatial—up until this point in the thesis. But some reflection, and examples such as (3)-(9), show that that this is very often not the case. We do not always think about the part-whole relation (only) materially and spatially. In fact, I want to propose that not only do we often *consider* events, properties, time, modality, etc. as parts of things (i.e., (3)-(7)), but that this is what is in fact the case: objects *do* in fact have properties, time, modality, etc. as parts. I will say more about this claim below.

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[58] See Lewis [1991: 76]

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For now, however, let me return to the point at hand. And let us be open to—for now—just the mere possibility that an object has more than just its material, spatial parts. (I will argue that this is no mere possibility, that it is in fact the case, as we proceed.) We are already, as sentence (1)-(9) seem to show, very liberal with our use of the term 'part', and our concept of parthood in general.

Also, let us recall that one of the reasons for thinking that Mereological Essentialism (ME) is implausible is that we tend to think that objects not only *could* lose and gain parts, but that they in fact *do*. But if ME is correct, then there is no possible world in which an object O has parts different than it actually has; it cannot be the case that O could have had one part more or less than the parts $O_1, .., O_n$ that it actually has, since O has $O_1, …, O_n$ in every world in which O exists, according to ME. And if O cannot gain and lose parts across worlds, it cannot gain and lose parts across time either. According to ME, O has all of its parts necessarily, and so there is no gaining or losing of parts *across the board*. And this may just seem flat-out unacceptable. Ordinary objects in fact *do* survive the loss of some of their parts, we might insist, they *can* survive the loss of some of their parts, and so any view which claims anything to the contrary must be false.

However, I want to suggest that this intuition is misguided in a certain way. When we assent to claims such as "ordinary objects in fact do survive the loss of some of their parts" and "ordinary objects can survive the loss of their parts", we have forgotten to consider all of the many (non-spatial and (maybe) non-material)

parts that ordinary objects have. Our intuitions about whether an object can or cannot gain and lose parts, in other words, is intimately tied up with our view of what sorts of things *count as parts*. And this, I have tried to show above, is something about which we are actually very liberal-minded.

Take my desk, for example. I had insisted above that it has remained the same desk over four years, even though I admitted that small molecules might have flaked off or have chipped away and been destroyed. But, at the time, we were only considering material, spatial parts—molecules and small bits of wood, say. Yet here is another claim that seems true of the desk, and that seems true about parts of the desk: there is part of the desk's life when it was just a hunk of wood. Think of it. Imagine that someone wanted to make a (rather boring) documentary about the life of my desk. We could imagine some grainy, poor-quality film footage of a hunk of wood in a furniture-maker's shop. The narrator says something like, "It all began right here in this shop. Here is the desk, about to be crafted." Etc. In a certain sense, then, the hunk of wood is part of the desk—the hunk of wood *is* the desk, way back when. It is true of the desk that it once was a piece of wood. And, in fact, this seems to be a very important feature of the desk. Put another way, it is a very important *part* of the desk that it once was a hunk of wood. If the desk had never been a hunk of wood, we might be inclined to say that the desk before us is very different desk from one that *had* once been a hunk of wood. So it is *part* of the desk that it *used* to be a certain way.[59]

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[59] I am treading on interesting topics about essences, and what it is that makes certain objects those particular objects. Is it essential to the desk that it have the history it has? If the desk had a

And here is another thing that seems true of the desk: it is part of the nature of the desk to *possibly* lose parts. Part of what it is for this desk to be a desk is that it *could* lose a (material) part here, or it *could* lose a (material) part there, etc. If this is true, then it seems to follow that at least one of the features of the desk is a bunch of modal features about it—it could lose certain (material) parts, maybe it couldn't lose others, etc. Part of what makes this desk a desk is that it *could* lose some (material) parts here and there! We often think that persistence conditions—i.e., those conditions under which some object persists—are an essential (or necessary) feature of those objects. Indeed, it is an essential (or necessary) *part* of them.

I am admittedly stretching your intuitions here, given that you have already granted me that we have a liberal notion of parthood. We shall see that it ultimately won't matter to me whether you are convinced of the *intuitiveness* of the idea of having temporal and modal properties as literal *parts* of objects or not. Ultimately, I do not hold much stake in the connection between intuition and the underlying metaphysical truths of reality.[60] But it does help to get a feel for the theory of objects I will be endorsing, and thinking of temporal and modal properties as parts of objects is a first step.

Moreover, thinking of temporal and modal properties as parts can be captured quite nicely by combining metaphysical views already established in the

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different history from the one it in fact has, would it still be the same desk? Could the desk be made out of a different hunk of wood and still be the same desk? These are all fine questions, but ones I will not have time to adequately address here—unless, of course, you think that these questions merely collapse into questions about *necessary parts* of objects.

[60] See my comments below, p. 48-9.

literature. To see this, let us make two assumptions for now (that we may later chose to drop): let us be realists about time and realists about possible worlds. We will assume that there are times other than the present, and that (certain versions of) Presentism is false. Second, we will assume that there are possible worlds other than the actual world. We need not (yet) say what times and worlds amount to—i.e., times and worlds could be abstract, ersatz sorts of things—so long as we are in agreement that they *exist*. In what follows, I will often talk as if times and worlds are concrete, non-ersatz sorts of things, but we need not do this in order to capture the spirit of the metaphysical view of objects I will be proposing. If I speak of 'worlds' and 'times' and you think that there are no such things, simply apply your usual translation schema to my world-talk and time-talk, as you are accustomed to doing, and you will be able to see how my view of objects can be ontologically accommodating.

Following Weatherson (ms), let us also assume (for now) that "objects which exist at more than one time (world) do so by having different parts at different times (worlds)." So we will be committed to both temporal and modal parts, and we will be committed to the idea that objects are temporally and modally *extended*.[61]

A four-dimensionalist, or *worm* theorist, defends the view that individuals are trans-time fusions. Individual objects are stretched out in time (and space)

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[61] Again, depending on your own view of time and modality, this idea of objects being 'extended' may be more metaphorical than literal. Details below.

the way that ordinary folk believe a road is stretched out (only) in space.[62] Desks, then, are spatiotemporal worms—mereological sums of time slices of three-dimensional objects. Our intuition that an important feature or part of the desk that it used to be a hunk of wood, just about to be carved, is nicely captured by the four-dimensionalist picture, since individuals are these spatiotemporally extended items that can be 'traced' over time.[63]

One of the benefits of such a view is that we can wriggle out of some of the traditional metaphysical puzzles.[64] Consider change over time: When you were 5 you were 3ft tall, not 5'3; now you are 5'3, not 3'0. We'd like to think that you, like the desk in my office, can remain the same object over time and despite some minor changes (a minimal growth spurt, say). But you at 5 years old had the property being 3'0 (and not 5'3). You at 32 have the property being 5'3 (and not 3'0). By the Indiscernibility of Identicals, then, you at 5 ≠ you at 32. So, despite what we might have initially thought, you do not survive over time and over change!

But four-dimensionalism to the rescue: this idea of 'you *at* 5' and 'you *at* 32' is a misdescription of the facts. Objects aren't wholly present *at* a time.

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[62] I am admittedly being a bit sloppy here. There are various different kinds of four-dimensionalism, and not all of them agree on the picture I am painting here. But since I am only using the four-dimensional view as a springboard for my own lump theory of objects, it is fine for now if I have not captured all four-dimensionalists exactly right. It is only the general idea of four-dimensionalism and temporal parts theory that is important for my purposes here. See Mark Heller's (1993) "Varieties of Four-Dimensionalism," Sider (2001), etc.

[63] Of course, there may still remain some vagueness issues about when exactly an individual's life begins and ends—i.e., where or when we can start to 'trace' an individual—but let us leave these issues aside from now, since they do not seem to affect the issue at hand.

[64] In fact, this is one of the leading reasons Sider is convinced that the view is true.

Rather, they are extended across time (and space). So a *part* of you is 3'0 (the part of you that is 5 years old) and a *part* of you is 5'3 (the part of you that is 32). But this is no more of a contradiction than that part of you is on the ground right now (your foot, for example) and a part of you is not (your head, let's hope). The four-dimensionalist can then give a nice gloss of what it is for an object to change over time: an object changes iff there is a a temporal part of the object that differs from another temporal part of that object. Change, then, "is difference between successive temporal parts."[65]

In a sense, then, an object on the four-dimensionalist picture does not, strictly speaking, gain and lose parts. Since an object, according to this view, is a trans-time fusion, the object—the fusion—has all of its parts all of the time; it doesn't gain and lose parts at all. But the four-dimensionalist accommodates our intuitions about ordinary objects gaining and losing parts by saying that what it *is* for an object to gain and lose parts is for the object to have a temporal part that differs from one of its other temporal parts. My desk has a temporal part, tp_1, let's say, that is composed of wood molecules $m_1, \ldots m_n$. My desk has another temporal part, tp_2, however, that is composed of wood molecules $m_1, \ldots, m_n,$ m_{n+1}. To say that my desk gained a part, then, is just to say that my desk has two temporal parts, tp_1 and tp_2, which differ in their m_is, such that tp_2 has all of the parts tp_1 has, plus one. So it is not the case that our statements about ordinary objects concerning change are flat-out false, according to the four-dimensionalist picture. But what makes these statements true is different than we might have

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[65] Sider (1997), (2001), (2007).

(pre-theoretically) thought. In this way, we can have a view of objects that sort of captures our intuitions about my desk: my desk *does* gain and lose parts and still remain the same object. It's just that the metaphysical facts of what it is for something to *change* are slightly different than we may have first supposed.

But let us take things a bit further. Let us imagine for a moment that we are not only stretched out across time (and space), but that we are stretched out across possible worlds as well. This might be called a kind of *five*-dimensionalism, or *lump*, view of objects.[66] According to this view, individuals are not only trans-time, but also trans-world individuals. What makes it the case that my desk could have one or more parts than it actually has is that in some other possible world, a part of my desk (the part that is in another possible world) has more parts than another part (the part of it that is in the actual world) does.

One worry for the four-dimensionalist was that they would not be able to account for the fact that we think that objects gain and lose parts over time. For if an object is just a trans-time fusion, then it in fact has all of its parts all of the time, and so—in a certain sense—*it* (the fusion!) doesn't lose parts at all. But the move was to recast our talk of temporal change into differences between temporal parts. Similarly, the lump theorist will need to address a parallel worry: we think that objects *can* gain and lose parts. We think that, even if my desk is actually made out of parts $p_1, \ldots, p_n$, in the actual world, it *could have been* made out of parts $p_1, \ldots, p_n, p_{n+1}$ instead; that is, it *is* made out of parts $p_1, \ldots, p_n, p_{n+1}$ in some other possible world.

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[66] Again, this terminology is borrowed from Weatherson (ms).

But similar to the move made by the four-dimensionalist, talk about differences of individuals (or counterparts) in distinct possible worlds will be cashed out in terms of differences between modal parts of trans-world (and trans-time, trans-space) individuals. An individual, then, has (at least) one part in one world, and another in another world.[67] Any differences between these parts will then be the basis for the modal facts about these individuals.

In what way can we make sense of 'modal facts' of these individuals? If objects such as tables and chairs and cats and mats—and all sorts of ordinary objects including you and me—really are these trans-world fusions, then how do we say of *these* trans-world individuals that it is possible that *they* lose parts or gain parts, or that it is possible that *they* run for president, or that it is impossible that *they* square the circle, etc? Just how do we make sense of what is possible and necessary for individuals that are stretched out over possible worlds?

This question is analogous to the following if, after the four-dimensionalist has described her view, we were to ask: "OK. I see that individuals are these trans-temporal fusions of instantaneous temporal parts. And I see that you have a way of recasting our talk of 'change' to capture our intuition that objects change over time. But what about these trans-time objects—these *fusions* of temporal parts—how can we make sense of *these* individuals changing over time?"

What the four-dimensionalist will surely point out to such an inquisitor is that such objects simply *do not* change over time. To think that they would or do

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[67] I suppose there could be strange individuals that have only one modal part, just like there may be strange individuals that have just one (instantaneous) temporal part, just like there may be strange non-extended objects that have only one spatial part, etc. But let's leave these weird objects aside for now; I will be discussing them briefly below.

would presuppose a confusion about what such objects *are*. Such objects are mereological fusions of temporal parts, and given what it is for something to change over time, such fusions simply do not change over time.

Similarly, given that the lump theorist is going to cash out the modal facts in terms of parthood—i.e., given that what is possible and impossible for you is made true by *parts* of you doing thus-and-so in other possible worlds—then such trans-world objects do not *themselves* have anything that is possible or impossible for them. Or, rather: all modal facts about such trans-world fusions are vacuously true, since there is no *one* world in which such fusions exists. Modal talk, in other words, about such objects simply doesn't make sense, given that modal talk is cashed out (according to the lump theorist) as *parts* of these lumps being in different worlds. The lump itself—the lump's improper part—is not *in* any one world; it is stretched out among many of them! So to ask about the modal facts of the lump is as much of a confusion as it is to ask the four-dimensionalist whether space-time worms change over time.

But let us return to two of the assumptions that I made at the outset of my explanation of a lump theory of objects. I said that I wanted to assume: (i) that we are realists about time, or (at least) non-presentists, and (ii) that we are realists about possible worlds. Some may be balking at (i); even more, no doubt, will be balking at (ii). If my suggested method of embracing Mereological Essentialism requires a commitment to modal realism (some may argue), then so much the worse for my view!

But just because I assumed modal realism and temporal realism does not mean that I *need* be committed to them. Indeed, I only assumed as much for a smoother elucidation of my theory of objects. Now that we have an outline of the view on the table, we can see what such a view would be like if we were to drop either assumption (i) or (ii).

Let us first imagine that we are realists about time, but are not modal realists.[68] We do not believe that there are concrete possible worlds, spatio-temporally isolated from each other, that contain world-bound individuals living in them. Perhaps we think that there are possible worlds, but these are abstract sorts of things—sets of sentences in Plato's heaven, or propositions, or fictitious objects, etc. In that case, I *still* think that objects are lumpy, trans-world (and trans-spatiotemporal) objects. It's just that the parts of objects that are 'in' these abstract possible worlds are themselves abstract. Our non-actual world-parts, then, are still *part* of us, they just happen to be *abstract* parts of us.

That we can have abstract things as parts should be acceptable for three reasons. One, if the view we are imagining is an ersatz view of possible worlds, then abstract things are already included in the (assumed) ontology. So one should not be resistant to abstracta in general, if they are already included in the presupposed worldview. Second, abstracta are already part of the world (we are supposing); so they are already *part* of something (i.e., the universe). So we

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[68] Recall that "modal realism" is unfortunately labeled, as readily admitted by Lewis (1986). A modal realist is the view that there are possible worlds and these worlds are concrete. So, a better name would be "Concrete world realism." An ersatzer about possible worlds believes that there *are* possible worlds, but that these worlds are abstract. So they might be labeled "Abstract world realism." Only the first view, however, is called "modal realism," even though both are realists about modality. And, of course, one could be a realist about modality, but not be a realist about worlds—perhaps one believes in brute modal facts, e.g.—and so one would *technically* be a modal realist. Unfortunately, since the inapt terminology has stuck, I'll keep using it as well.

should not find it objectionable that such things are *parts* of people. Third, we've already admitted at the beginning of this section that our ordinary use of 'part of' is quite liberal, and so claiming that we have abstract things as part should be (in principle) no different than claiming that (e.g.) trigonometry is a part of mathematics. So even if one believes that there are possible worlds, but believes that possible worlds are abstract, not concrete, I can still accommodate my lump theory of objects to suit such a view. I will still maintain that ordinary objects are trans-world individuals—it is just that the worlds and world-parts in question are abstract rather than concrete.

Now imagine that you are not a modal realist (i.e., you do not believe in concrete possible worlds), but you are not an ersatzer either (i.e., you do not believe in abstract possible worlds). Still, you must have *some* story about what makes our modal statements true. You either are committed to possible worlds, and they are either concrete or abstract; or you are a fictionalist about possible worlds, but you have a story to tell about how these fictions work; or you are an eliminativist about possible worlds, and are committed to brute modal facts or truths, or brute modal properties, etc.[69] *Whatever* your modal story is going to be, I can accommodate the lump theory of objects to suit it: you tell me what's in your ontology to account for our rich array of modal truths, and then I will tell what ordinary objects are—mereological sums of spatial, temporal, and modal parts (where the metaphysics of 'modal parts' here is supplied by you, and the theory of modality that you accept).

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[69] Or I suppose you could deny that there are modal truths at all. But then the Modal Objection, and all of the worries being dealt with in this chapter, would never get off the ground. Thanks to Ted Parent for discussion here.

And a similar adaptation of my lump theory of objects will apply to your favorite view of time. Let us suppose that you are a Presentist about time. You think that there only exists the present, and present objects, and that there is no such thing as the past, or the future, or any past or future objects such as dinosaurs or flying cars. Still, on such a view, you *do* have a way of grounding the truths of our tensed claims. "Bill Clinton was president" still comes out true on the Presentist view (as it does on the four-dimensionalist view, e.g.). It's just that the metaphysical story about what makes it true is different than the four-dimensionalist story. According to one kind of Presentist, what makes the above past-tensed statements true is that Bill Clinton presently has the property *having been president.* So past-tensed statements are made true by presently existing objects having certain tensed properties. So if this kind of Presentist has already granted that there are tensed properties in her ontology, then I can accommodate my lump-theory of objects to suit her metaphysical preferences. I will maintain that tensed-properties are *parts* of ordinary objects.[70] Indeed, ordinary objects are mereological sums of spatial, temporal, and modal parts—it's just that 'temporal parts' here can be interpreted in a Presentist-friendly way.

Analogous with the move made concerning modal parts, *everyone* has to have a story about our temporal truths. *Whatever* your temporal story is going to

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[70] This is assuming two things: (i) that tensed properties are the truth-makers of tensed statements, and (ii) that the relation between an individual and their properties is mereological (e.g., an immanent theory of properties). Neither of these assumptions is uncontroversial, but I do not have the space here to defend them. My main point in flagging the assumptions is to show that my lump theory is somewhat accommodating and flexible; it can be adjusted to many different views of time and modality. But it is not completely non-committal. See section 5 of this chapter for further discussion. Also, see Aristotle, Plato, Frege, Armstrong, Campell, Forrest, Bigelow for a discussion on assumption (ii). See Loux "Aristotle's Constituent Ontology OSM vol. 2. Craig Burne is a presentist who denies (i). Thanks to Jason Bowers for discussion here.

be, I can accommodate the lump theory of objects to suit it: you tell me what's in your ontology to account for our rich array of temporal truths, and then I will tell what ordinary objects are—mereological sums of spatial, temporal, and modal parts (where the metaphysics of 'temporal parts' here is supplied by you, and the theory of time that you accept).

Thus, even though I assumed at the outset a certain view of time and a certain view of modality, we can see now that I need not have done so. (In fact, I only did so to maintain the analogous moves between the temporal parts theorist and the lump theory of objects, and make my theory of objects more accessible.) So it is no objection to my lump theory of objects that its ontological commitments are too costly. My lump theory of objects can be accommodated to suit nearly any ontological view of the world, so long as that view has some story about what grounds our spatial, temporal, and modal facts. So there should little objection to my lump theory on the grounds that it commits one an outrageous ontology.[71]

Obviously, this claim goes double if CI is true. For if mereological sums just *are* identical to the parts that make them up, and I claim that ordinary objects are mereological sums of spatial, temporal, and modal parts (where what counts as 'spatial', 'temporal', and 'modal' parts is filled in by you and your favorite metaphysical world-view), then there have been no extra ontological commitments made by bringing on board CI and the lump theory of objects. The only ontological commitments you will have are those that were already in place prior to my theory of composition and my theory of objects. CI and the lump theory subsume your preferred theory of time and modality, and deliver an

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[71] This of course depends on how sparse your ontology already is. See below, section 5.

ontologically friendly package—ontologically friendly *relative* to commitments you are already beholden to.

But perhaps you are thinking: Look, I don't object to this view because I think it is ontologically excessive. I object to this view because it seems just plain unintuitive and crazy!

I do not have time for a complete defense of a lump theory of objects, so I will just say a few quick words here. First, I think our intuitions about what objects are—the underlying metaphysical facts of objecthood—are guided in part by what we say, and the sentences and utterances we accept. Some of the things that we say are the sentences (1)-(9) that we listed at the beginning of this section. And, as discussed above, most of these do not straightforwardly involve spatial or material parts; rather, many of them involve aspatial or immaterial parts, depending on your theory of (e.g.) events, propositions, reasons, properties, etc. Insofar as any of these sentences are acceptable, thinking about objects as having more than just spatial or material parts *is* acceptable.

Second, however, we use our ordinary intuitions to *motivate* us to think carefully about metaphysics, to get us initially intrigued about metaphysical puzzles. It may turn out that, after some reflection, our ordinary intuitions are misguided. We have been known to think that the earth is flat, that it is at the center of the universe, that objects such as tables and chairs are not mostly empty space, that Newtonian physics is correct, etc.; we don't have a terrific history of *intuiting* the truth. So, as a purely general point, I do not take

'incredulous stare' objections as having much weight, dialectally.[72] Of course, it will always be better, all else being equal, that a theory is intuitive rather than not. But if the only complaint against the lump theory object is mere incredulity, then I will consider my defense of the lump theory of objects as a success.

Finally, in metaphysics, it is common practice to let the utility of a view count as evidence in favor for it.[73] Sider, for example, thinks that the ability of four-dimensionalism to solve classic philosophical problems is a good reason to think that the view is true. If that's right, then it seems that my lump theory of objects adopts all of the reasons that Sider has for thinking that *his* temporal parts view is true (since I posit that there are at least temporal parts), and then some.

Sider's view takes a decidedly *ad hoc* turn when he considers objects (such as Goliath and Lumpl) that have completely overlapping temporal careers. Sider cannot resort to his temporal parts theory to solve this particular puzzle, because by stipulation, Goliath and Lumpl share all of their temporal parts. Sider claims that it is due to an "inflexible account of *de re* modalities" that is responsible for generating puzzle cases such as Goliath and Lumpl. He claims that the purported distinguishing feature between Goliath and Lumpl—e.g., *that Lumpl could have survived being smushed, but Goliath could not have*, etc.— should be resisted as a distinguishing feature. Rather, Sider claims that

> "…surely [this apparent difference] is due in some way to a shift in our conceptualization of a single object, rather than a difference between two

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[72] Nor does Lewis. See Lewis (1986).

[73] See Lewis (1986); Sider (2002); etc.

objects; surely, adopting a flexible account of *de re* modal predication, or a flexible error-theory, is a more sensible alternative than multiplying entities corresponding to their modal differences." [74]

Sider then invokes the notion of counterparts to solve the Goliath and Lumpl puzzle. He claims:

> "To say that Lumpl might have survived flattening is to say that Lumpl has *lump* counterparts that survive flattening; to say that Goliath could not have survived flattening is to say that Goliath has no *statue* counterparts that survive flattening. Nonetheless, Lumpl *is* Goliath."

So Sider claims that (i) we must choose between either ontological excess due to individuating objects according to their modal properties or adopting a flexible account of *de re* modal predication, or a flexible error theory, and (ii) that we should avoid ontological excess, avoid an error-theory, and instead adopt a counterpart theoretic explanation of how it is that we have a flexible account of *de re* modal predication.[75]

But (i) is a false trilemma, which undermines our primary reason for accepting (ii). On my lump theory of objects it will *not* be ontologically excessive to individuate objects (such as Goliath and Lumpl) according to their modal properties. I claim that ordinary objects are mereological sums of spatial, temporal, *and* modal parts. If Goliath and Lumpl have completely overlapping temporal careers, this need not mean that we cannot distinguish them—for they will not have completely overlapping world-careers (the details of this will be

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[74] Sider 2001, p. 113-4.

[75] This last claim is not wholly supported by the passage I've quoted above, but can be surmised by what Sider does say in other sections of Sider (2001).

fleshed out below).[76] But it will not mean that we are being ontologically excessive either, since I am not positing any additional items that Sider himself does not already have in his ontology. For Sider already has all of the lump counterparts, and all of the statue counterparts of Goliath and Lumpl. He maintains that Goliath is identical to Lumpl; I claim that Goliath is distinct from Lumpl. This might seem then, on the face of it, that I am adding to the number of entities in my ontology: I have just distinguished two objects where he thinks there is one.

But I maintain that what 'Goliath' and 'Lumpl' refer to when Sider claims that Goliath is identical to Lumpl is merely a world-*chunk*—a world part that certain trans-world objects happen to share. When I claim that Goliath and Lumpl are distinct, 'Goliath' and 'Lumpl' refer to lumpy, trans-world, trans-spatiotemporal objects. In one world, it just so happens that Goliath (the trans-world fusion) and Lumpl (the trans-world fusion) overlap one of their *world* parts—just as two trans-temporal mereological sums can overlap one their *temporal* parts (e.g., Tib and Tibbles), and just as two trans-spatial mereological sums can overlap one or more of their *spatial* parts (e.g., an intersecting road). Goliath and Lumpl do not overlap *all* of their world parts, which is why it is that Goliath and Lumpl (the trans-world objects) are distinct; but the do overlap (at least) one of them, which is why we tend to (mistakenly) think that Goliath and Lumpl are completely coinciding.

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[76] For a different take on the idea that purported co-incident objects (e.g., Goliath and Lumpl) are cases of (incomplete) overlap, rather than total coincidence, see L.A. Paul "Coincidence as Overlap" in Nous (2006). Paul takes objects to be fusions of properties, which may be compatible with the lump theory of objects that I am endorsing here.

Given that Sider already countenances (e.g.) lump counterparts and statue counterparts—i.e., individuals in other possible worlds that I claim are the world parts of trans-world mereological fusions—and given that his claim that Goliath is identical to Lumpl is translated on my view as merely a case of world-chunk overlap, my view will be no more ontologically excessive than Sider's. I am merely taking the 'part' part of counter*part* seriously. What Sider countenances as counterparts of world-bound individuals, I countenance as genuine world parts of trans-world individuals.

Moreover, I will have the added advantage of not appealing to counterpart theory in a suspiciously ad hoc way, to solve the modal analog of the temporal puzzle of the statue and the clay. Having parallel mereological explanations of spatial, temporal, and modal differences of distinct objects is theoretically elegant, which should add to its overall plausibility. There are no spatial, temporal, or modal differences, I claim, without a difference in spatial, temporal, or modal parts. Not so on Sider's four-dimensional view, however, where spatiotemporal differences are cashed out in terms of a difference in spatiotemporal parts, but where a modal difference is cashed out in terms of counterpart theory, and the flexibility of *de re* modality.

If in the course of the rest of the chapter, I can show how my lump theory of objects can solve the four constitution puzzles delineated above, then I will have thereby provided some reason to think it is true. If I can show that my lump theory solves the puzzles more elegantly than any of the competitors, then this will only add to the lump theory's appeal.

So in the end, if we have evidence that my lump theory of objects has enormous utility as a theory of objects—if it can solve puzzles, be explanatorily robust, be theoretically elegant, and be (reasonably) ontologically responsible—then this will counterbalance any initial cognitive resistance to it. A theory's ability to solve a myriad of problems should always count more than the theory's (initial) un-intuitiveness, all else being equal.

Alright. Now that we have the outlines of a lump theory of objects on the table, let us return to Trenton Merrick's claim in his argument that CI entails ME. I had said previously that I agreed with this premise; I think that CI *does* entail ME. But in light of my endorsement of a lump theory of objects, we can see that my interpretation of such a premise yields a slightly different interpretation than the one that was intended by Merricks.

Composition as Identity (CI): Any composite object, O, is (hybrid) identical with the objects $O_1, \ldots, O_n$ that are its parts; $O =_h O_1, \ldots, O_n$.

Mereological Essentialism (ME): Any composite object, O, is composed of (all and only) its parts $O_1, \ldots, O_n$, in every possible world in which O exists.

ME claims that any composite object O, is composed of (all and only) its parts $O_1, \ldots, O_n$, in every possible world in which O exists. But notice that this is going to turn out trivially true on my lump theory of objects. Suppose O is a lumpy, trans-world object, with parts $O_1, \ldots, O_n$ in different possible worlds. But then O doesn't exist in any *one* world—by hypothesis, O's parts $O_1, \ldots, O_n$ are scattered across different possible worlds. If ME was false, then O would exist in a world

without $O_1, \ldots, O_n$. Yet in every world in which O exists (none of them!), O is composed of all and only its parts $O_1, \ldots, O_n$. So ME is never false; so it is true.

Now suppose O is a world-bound object—a strange object that has no modal properties because it is not worldally-extended; it is just a world-*chunk*. It exists in only one possible world, and no other. (This is analogous to an object that has no temporal properties because it is not temporally-extended; it is just a time-*slice*.) And suppose O is composed of (world-bound) parts $O_1, \ldots, O_n$. If ME was false, then O would exist in a world without $O_1, \ldots, O_n$. Yet in every world in which O exists (just the one!), O is composed of all and only its parts $O_1, \ldots, O_n$. So, again, ME is never false; so it is true.

So either way—whether we are considering lumpy, trans-world fusions, or unlumpy, world-bound fusions—ME is true.

One might claim that this is a bit of a cheat on my part: I endorse ME only because it is trivially true given my lump view of ordinary objects. But ME, interpreted this way, seems to capture an intuition that metaphysicians thinking about modality have held for quite some time. Many metaphysicians have thought that claims about what is possible and necessary are themselves necessary.[77] If it is possible for me to be at a bar right now, then it seems necessary that it is possible for me to be at a bar right now. This intuition coupled with a liberal notion of parthood, such that we consider the idea our modal truths are made true by having modal parts (e.g., different parts in different possible worlds), just delivers us the lump theory of objects I am endorsing here. And on

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[77] I.e., the modal system S5, where one accepts the following axiom: $\Diamond p \rightarrow \Box \Diamond p$.

such a view ME is true! If modal claims are made true by having modal parts, and if modal claims are true necessarily, then ME simply follows—i.e., it turns out that we have all of our parts necessarily, one way or another.[78] As such, I think that ME can be plausibly defended, and in such a way that blocks Merrick's argument. We simply accept that CI entails ME, accept CI, and then show how our theory of objects entails that ME is (plausibly!) true. In this way, Merrick's argument will be ineffective against CI.

4.3   Back to the Puzzles

Now let's apply my theory of objects to the constitution puzzles. Take, for example, the Marriage Paradox. We suppose that people are just a collection of molecules. And we also suppose that there are at t_1 two people, p_1 and p_2—i.e., two groupings of molecules, M_1 and M_2, such that $p_1=M_1$ and $p_2=M_2$—exchanging vows on a wedding day. Yet seven years later, at t_7, there are two groupings of molecules, M_3 and M_4, which are distinct from M_1 and M_2, such that $M_1 \neq M_3$ and $M_2 \neq M_4$. So by the transitivity of Identity, $p_1 \neq M_3$ and $p_2 \neq M_4$. But then the two people, p_1 and p_2 are not bound by the vows to be committed to each other, since they presumably do not exit at t_7 (only M_3 and M_4 do).

This puzzle assumes that people are identical to a grouping of molecules *at a particular time*. A four-dimensionalist view of the matter, however, claims that people are these four-dimensional worms, mereological sums of spatial and temporal parts. It is not the case that two people such as p_1 and p_2 are identical

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[78] That is, it's either because we are trans-world objects, or world-bound objects, but either way, we have all of our parts necessarily.

to some molecules at a particular time, and so it is *not* the case that $p_1 = M_1$ and $p_2 = M_2$. Rather, p_1 and p_2 are each identical to some mereological sum of spatial and temporal parts. Moreover, what it would be to make a promise or vow on the four-dimensional view might be to promise that you, *qua* worm, will be committed to such-and-such; and so all of your temporal parts, from the time of the promise onward, are bound by the promise.[79]

Since my lump theory of objects subsumes the four-dimensional strategy, I will make a similar move, modulo the commitment to a particular theory of time. Since people, according to my theory of objects, are simply lumpy objects, with spatial, temporal, and modal parts, then I will deny the claim that the two people involved are identical to some molecules at a particular time; i.e., I claim that $p_1 \neq M_1$ and $p_2 \neq M_2$, and so the inference that a person does not survive a change in their spatial parts is blocked.

Similarly, with the Ship of Theseus puzzle. I will claim that an object is identical to all of its spatial, temporal, and modal parts. Of course, in the Ship of Theseus, we have the added complication of having a competitor for identity (recall: there is ship A in the beginning, there is ship B that is the result of small replacements of parts over time, and then there is ship C which composed of all of the material parts (board, mast, etc.) that composed ship A). But this shouldn't matter. For our mistake was in setting up the puzzle. We assumed that there were three candidates for identity ship A, ship B, and ship C. Of course, on my lump theory of objects, *ships* proper are five-dimensional lumps—mereological

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[79] I do not intend to commit a four-dimensionalist to a particular view of promises here; I merely mean to suggest that this is one way the four-dimensionalist could go, and it would add to a nice detail to the solution of the puzzle.

sums of spatial, temporal, and modal parts. So, strictly speaking, calling A, B, or C a ship was a category mistake. A, B, and C were defined only in terms of their spatial parts (boards, mast, sail, etc.), and being located at a time. According to the lump theory, ordinary objects don't exist *at* a time. Ordinary objects are temporally (and modally) extended.

Still, you might think that this is a merely technical objection. "Who cares whether we call A, B, and C *ships*," you might think. "There is still a poignant question: what is the relationship between A, B, and C (whether they count as ships or not)? We had reason to think that A=B, and we had reason to think that B=C, but we also had reason to think that A≠C, thus violating the transitivity of identity. So this is a puzzle whether or not you think that the objects involved are properly ships or not."

The point about whether the objects involved are ships or not *is* important, however, since it will explain why it is that we deny one of the above identity claims. Our reason for thinking that A=B tracked our intuition that objects can survive a loss, gain, and replacement of parts, and still remain the same object. But this, according to the lump theory of objects, can be glossed as *one* object that differs in some of its temporal parts, just as you (or your body) might differ in some of your in spatial parts—e.g., your foot is flat and you head is round.

So suppose we take 'A' to designate some material, spatial parts at a time, and 'B' to designate some material, spatial parts at another time, then A≠B because A and B differ in some of their material, spatial parts—e.g., A is made up of boards $b_1, \ldots, b_n$ and B is made up of $o_1, \ldots, o_n$, and none of the b_is are

identical to any of the o_is.[80] The analogy to your body: your foot is not identical to your head because your foot is made up of molecules $m_1, \ldots, m_n$ and your head is made up of molecules $n_1, \ldots, n_n$, and none of the m_is are identical to any of the n_is. But just because A might not be identical to B does not mean that there isn't *one* ship that has A and B as parts. Similarly: just because your foot is not identical to your head does not mean that there isn't *one* body that has your foot and head as parts. Our reasons for thinking that A=B in the first place are now explained away as a mistakened bit of reasoning. We thought that just because there is one thing (the ship!) that has A and B as (temporal) parts, then A must be identical to B. But this would be just as mistaken as concluding from the fact that your body has your foot and head as parts, that your foot must be identical to your head.

So a lump theorist might deny that A=B, without denying that there is a single thing—the ship!—that has A and B as (parts), and survives over time. Explanation: what it means to 'survive over time' is receiving a different analysis than we may have first supposed (i.e., what it is for an object to 'survive over time' is just for *it*—the mereological sum of spatial and temporal parts—to have temporal parts that are connected in the right way (causally, e.g.)).

What about C? 'C', we might claim, picks out (only!) some material, spatial parts—the boards, mast, sail, etc., that 'A' picked out. And so A=C, if all of the

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[80] It should be noted that this is *not* the solution the Sider prefers, since he thinks that 'A' and 'B' pick out spatiotemporal time-slices, rather than mere spatial parts as I am assuming here. See below for discussion.

material, spatial parts are identical, which by stipulation they were.[81] But this does not then mean that either A or C is a *ship*, since ships are lumpy objects, mereological sums of spatial, temporal, and modal parts. So even though a lump theorist will admit that A=C, she will deny that this means that there is another *ship* that is a competitor for the ship that was under discussion a moment ago— the mereological sum of lots of spatial and temporal (and modal parts), including A and B.

Of course, it might be argued that there is a distinct ship that includes spatial parts A, C (since A=C), and a bunch of temporal and modal parts, such that the lumpy object we are left with is one that began as a bunch of boards $b_1,\ldots, b_n$, then was just one board, then two, then three, then four, etc., until it was a bunch of boards again $b_1,\ldots, b_n$. This would just be the mereological sum that results if we 'trace' the object that is all of the original boards, and then an accumulation of those same boards as they are discarded from the *other* ship. If such a trans-spatiotemporal (trans-world) object is indeed a ship, then it would be distinct from the other ship, since they have distinct temporal (and presumably modal) parts. But even so, there is no puzzle here. At least, we no longer have a violation of the transitivity of identity as we did when the puzzle was originally being generated. There might be another issue as to which ship—which mereological sum of spatial, temporal, and modal parts—we mean to be picking out when we dub ships by a name, such as "Ship of Theseus." But there is no genuine paradox here. We will not be able to generate a contradiction, for

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[81] Again, I am ignoring for now any temporal differences between A and C, and only concentrating on the spatial properties (or parts).

example, since we will simply deny one of the identity claims that was responsible for it—namely, we deny that A=B.

Alternatively, we might deny that 'A', 'B' and 'C' pick out *merely* spatial parts; we might claim that 'A', 'B' and 'C' as pick out spatio*temporal* parts.[82] Then the solution to the puzzle would be as follows: there are two relevant mereological sums, or ships. One is the mereological sum of all of the spatiotemporal parts A through B, and one is the mereological sum of all of the spatiotemporal parts A through C. Each of these mereological sums is distinct, because they have distinct spatiotemporal parts (in particular, one has B as a part, and the other has C as a part). But each mereological sum overlaps or shares the spatiotemporal part A. But overlap of spatiotemporal parts is no more of a problem than overlap of a (mere) spatial part: Franklin St. can overlap Columbia such that they share a bit of the road where they intersect; your office can overlap your colleague's office by sharing a wall, etc. So if we think that 'A', 'B' and 'C' pick out spatiotemporal parts (instead of merely spatial parts) then it will not be the case that A=C; but it will be the case that the mereological sum that has A and B as parts, and the mereological sum that has A and C as parts overlap: the sums share part A. Either way, however, the lump-theorist (as well as the four-dimensionalist) has an elegant solution to the puzzle.

And similar reasoning will apply to the remaining puzzles Tib and Tibbles, and Goliath and Lumpl. In Tib and Tibbles, we simply deny that Tibbles (the cat) is an object that can wholly exist at a time. Like the ships and people, cats are lumpy objects, mereological sums of spatial, temporal, and modal parts. The

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[82] This is the solution Sider favors. Sider 2001.

puzzle is generated, however, by the mistaken assumption that cats are only

composed of spatial parts, or—more carefully—that they are not mereological

sums of spatial *and* temporal parts. So in our argument—

1. **Tibbles at t_1 = Tibbles at t_2** (By commonsense intuition: we don't think that cats go out of existence when they lose their tails).

2. **Tib at t_1 = Tib at t_2** (Nothing happened to Tib at all!)

3. **Tibbles at t_1 ≠ Tib at t_1** (By LL: one has a tail and the other doesn't).

4. **Tibbles at t_2 = Tib at t_2** (Every region occupied by Tibbles is occupied by Tib; "they" have no difference-making feature).

5. **Tibbles at t_1 = Tib at t_2** (By 1, 4, Substitutivity of Identicals).

6. **Tibbles at t_1 = Tib at t_1** (By 5, 2, Substitutivity of Identicals).

7. **Tibbles at t_1 = Tib at t_1 & Tibbles at t_1 ≠ Tib at t_1** (3, 6, &I)

—we would (at least) deny premise 1. 'Tibbles' is the name of a cat, and cats are

not the sorts of things that wholly exist 'at' a time, just as you do not exist wholly

where your arm is or wholly where your head is. 'Tibbles', rather, picks out a

mereological sum of spatial and temporal parts, one of which is (e.g.) a

spatiotemporal slice at t_1, another of which is (e.g.) a spatiotemporal slice at t_2 .

These two parts, of course, are not identical to each other, but (again) that no

more implies that there isn't a single thing that has those slices as parts, as does

the fact that your foot is not identical to your head implies that there isn't a single

thing (your body) that has those appendages as parts.

Moreover, once we trace the Tib spatiotemporal worm, and compare it to

the Tibbles spatitemporal worm, we will see that Tib and Tibbles merely overlap

one of their spatiotemporal parts—the part at t_2. But, again, overlap is never a

problem. Thus, there is no contradiction, and the puzzle is solved.

As for Goliath and Lumpl, we will need to move beyond an appeal to

spatiotemporal parts, and appeal instead to modal parts—and this is where,

incidentally, we will see an advantage of the lump theory of objects over the four-

dimensional, temporal parts view. Recall that Goliath and Lumpl come into and

go out of existence simultaneously; they have completely overlapping temporal

careers. So unlike the previous puzzles, it will not help to appeal to the temporal

parts of Goliath or Lumpl—by stipulation, Goliath and Lumpl share all of their

spatial and temporal parts. Yet the features that were supposed to distinguish

them were their modal properties: Lumpl *could* survive being smushed or

rearranged, but Goliath *couldn't.* Goliath *could* survive the loss of a toe or an arm,

say, but Lumpl *couldn't.* So by the Indiscernibility of Identicals, Lumpl and Goliath

are distinct; yet if so, then this violates our principle **S**:

> **S**: Two things cannot completely occupy exactly the same place or exactly
> the same volume (or exactly the same subvolumes within exactly the
> same volume) for exactly the same period of time.[83]

Of course, if we accept my lump theory of objects, then we will quickly realize

that **S** isn't quite right—in particular, it is misleading, and it is not strong enough.

It is misleading because it suggests that objects can be wholly or completely

located at a time. If ordinary objects are indeed lumpy, then they are

mereological sums of spatial, temporal and modal parts. They are not wholly

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[83] Again, this is pulled from David Wiggins, "On Being in the Same Place at the Same Time," in *Philosophical Review* (1968).

located at a particular place, time, or world. Moreover, S is not strong enough

because, as the case of Goliath and Lumpl show, some objects might completely

overlap spatially and temporally, yet still be distinct. What we need is a principle

that claims that no two objects can completely overlap spatially, temporally, *or*

worldally (or modally, if one prefers). We should adopt something like principle

S+:

> **S+**: Two things cannot completely overlap in their spatial, temporal, and modal parts; for any object, x, and any object, y, if x and y completely overlap all of their spatial, temporal, and modal parts, then x = y.

Since S+ is stronger than S, it claims at least as much as S does. So someone

who accepts S+ will be friendly to the spirit of S, albeit she will want need to

reformulate S so that it does not presuppose that objects are wholly present at a

time.

But even if we accept the stronger S+, Goliath and Lumpl will not be in

violation of it if we accept the lump theory of objects. This is because while it may

be the case that Goliath and Lumpl have completely overlapping spatiotemporal

careers, they do not have completely overlapping world-careers. Indeed, by the

very stipulation that they vary in their modal properties, this means (on the lump

theory) that they vary in their modal *parts*. What makes it true that Goliath could

have lost an arm, but Lumpl couldn't have, is that there is a world where Goliath

has a part and is armless, yet Lumpl does not have a part in any world that is

armless. What makes it true that Lumpl could survive being smushed but Goliath

couldn't have is that there is a world where Lumpl has a part that is smushed, but Goliath does not have a part in any world that is smushed.

On the spatial analog, what makes it true that the road changes terrain is that it is (e.g.) bumpy in one part and smooth in another. On the temporal analog, what makes it true that you changed from being short to tall, is that you have one temporal part that is short and another that is tall. Similarly, on the modal dimension, what makes it true that you could have won the lottery, but in fact didn't, is that you (the trans-world object) have one modal part that wins the lottery and one modal part that does not.

So, Goliath and Lumpl have parts that overlap in (at least) one world—the world that generates the puzzle. But they do not overlap in all worlds, or else they would not vary in their modal properties (and hence, 'they' would not be distinct). And so that it is how the lump theory of objects successfully solves the Goliath and Lumpl puzzle of constitution.

Incidentally, there is a modal analog to the Tib and Tibbles puzzle that is discussed in the literature.[84] Let us call this the puzzle of Nib and Nibbles. Consider a cat, Nibbles, who, in fact, never loses his tail. Surely, however, Nibbles *could have* lost his tail (and still survived). Using world-talk, we say that what makes it true that Nibbles could have lost his tail is that in some world Nibbles *does* lose his tail. Let us call the part of Nibbles minus his tail, Nib. And let's go to the world where Nibbles loses his tail. But then, this is just a world where Nib and Nibbles (seemingly) completely coincide!

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[84] See Van Inwagen (1981), Heller (1990), Sider (2001), etc.

Of course, on the lump theory of objects, such a puzzle will be seen as corrupted from the start. This is because the set-up assumed that ordinary objects such as cats and tails are wholly located *at* a world. Not so, says the lump theorist. Nibbles is a lumpy, trans-world object that has lots of parts in different worlds. Nib is, likewise, a lumpy trans-world object that has lots of parts in different worlds. The world where Nib and Nibbles purportedly completely coincide, is merely a case of overlap of a world part.

Interestingly, Sider thinks that the modal version of Tib and Tibbles—what I have here called the puzzle of Nib and Nibbles—is a paradox for everyone. He claims:

> "…the modal version of the paradox of undetached parts confronts everyone, not just a defender of temporal parts. A reasonable attitude about this sort of modal paradox might be a bit like one attitude towards the liar paradox: 'well, *that's* a difficult problem, and must be solved somehow, but until I learn how to solve the problem, I will carry believing what seems to be right on other grounds'."[85]

Sider then claims that his preferred solution here mirrors his preferred solution to the Goliath and Lumpl puzzle (not surprisingly): he appeals to counterpart theory, and flexible *de re* modal predication.

There is no need for this seemingly *ad hoc* maneuver on the lump theory of objects, however, since we merely appeal to the differences in parts of trans-world objects to individuate Nib and Nibbles. Moreover, the modal analogs of temporal puzzles (e.g., Goliath and Lumpl, Nib and Nibbles) no longer seem like paradoxes on a par with the Liar. On the contrary, we have a very straightforward

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[85] Sider (2001: 221).

explanation of how the puzzles are generated, and a solution to offer that is as elegant as Sider's solution to the temporal version of the puzzles. So, again, if utility and elegance are the measure of success for a metaphysical theory, the lump theory of objects has success in spades.[86]

5. Back to the Modal Objection

Let us now return to CI and the objection that began this chapter: the Modal Objection. Recall that the worry for CI was that parts cannot be identical to wholes because parts and wholes vary in their modal properties. Parts (such as the molecules that compose your hand) can (e.g.) survive being scattered, but wholes (such as your hand) cannot.

But let us keep in mind the lessons we've learned from my lump theory of objects, and its application to the constitution puzzles: most ordinary objects are not merely spatial parts. Rather, ordinary objects are mereological sums (lumps)

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[86] Another advantage of my lump theory of objects is that it avoids Sorites-like arguments for the Eliminativism of ordinary objects. Van Inwagen (1990), Unger (1979) ["I do not exist" in Perception and Identity, G. F. MacDonald (ed.) (1979)], and Merricks (2001) all give such step-wise arguments to conclude that ordinary objects such as tables and chairs do not exist (i.e., they argue against the existence assumption). These arguments rely on accepting a tolerance for small changes—e.g., we must at least agree that objects can lose small parts. If my lump theory of objects is correct, however, and we should thereby embrace mereological essentialism as I've shown above, then strictly speaking objects do not lose parts, not even really, really small ones. So, one will block all sorties-type arguments for Eliminativism since we need not grant that we have a tolerance for objects losing parts. There are other arguments for Eliminativism that do not rely on Sorites-type objections (e.g., Merrick's arguments concerning overdetermination), but these arguments will be blocked by embracing (only) CI, or embracing CI and a lump theory of objects. Merricks claims that a ball and the parts of a ball seemingly *both* shatter a window, thus giving us reason to think that the shattering is overdetermined by the whole (ball) and its parts. According to CI, the ball is identical to its parts, so there are no distinct things to overdetermine anything. According to CI plus the lump theory of objects, the ball is a lumpy trans-world object that overlaps in this world with another lumpy, trans-world object (e.g., the ball, and the molecules of the ball). Since overlap is never a problem, then causation by objects at their overlapped bits should not be a problem either. So arguments for Eliminativism that appeal to overdetermination will also be ineffective if we accept CI, or accept CI and my lump theory of objects.

of spatial, temporal, *and* modal parts. Now, sure, there are some odd objects that are not extended worldally (or modally, if you prefer); there are some objects that are indeed world-bound. But such objects won't have modal properties, since what it *is* to have modal properties (on the lump view) is to be extended across worlds (or, at least, such objects would inherit certain modal properties trivially, because they only exist in one possible world).[87] Similarly, a four-dimensional temporal parts theorist might admit that there are non-temporally-extended objects, instantaneous objects that are extended only spatially, say. But such an object wouldn't have a history, a past, or a future. For what it *is* to have these temporal features is to be extended temporally—i.e., to be a mereological sum that has various temporal parts.

So someone claims that the parts (some molecules, e.g.) could survive being scattered, but the whole (your hand, e.g.) could not. On the lump theory of objects, this claim—like any other modal statement—is made true by having lumpy trans-world mereological sums whose world parts are doing thus-and-so. So 'the molecules' picks out a trans-world, trans-spatiotemporal object that has different (world) parts in different possible worlds. In some worlds, the (world) parts of this (trans-world) object has (spatial) parts that are scattered; in other worlds, the (world) parts of this (trans-world) object has (spatial) parts that are *not* scattered. This, then, is what makes it the case that (e.g.) the molecules *could have been* scattered—the relevant trans-world object has (at least) one world part that *is* scattered. In contrast, 'your hand' picks out a trans-world, trans-

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[87] Recall that I am adopting world-talk because of its extreme utility. If you are not committed to possible worlds, then take this talk of 'being *extended* across possible worlds' metaphorically, and apply the appropriate translation schema to generate the modal claims you do accept.

spatiotemporal object that has different (world) parts in different possible worlds.

Yet this trans-world object has no (world) parts in any world where its (spatial)

parts are scattered. So this is what makes it true that (e.g.) your hand *could not*

have survive being scattered—the relevant trans-world object has no part in any

world where is it's spatial parts are scattered.

Thus, contrary to what some might have thought, I *will* grant that ordinary

objects such as molecules and hands can differ in their modal properties. Yet this

does *not* thereby result in an objection to CI. This is because, on my theory of

objects, ordinary objects such as (e.g.) molecules and hands turn out to be lumpy

mereological sums of spatial, temporal, and modal (or world) parts. As such, their

modal features are inherited from their world (or modal) parts. If we ever have a

case of overlapping world parts (which we very often do), then this presents no

more of a problem than spatial overlap, (e.g.) intersecting roads. The reason

many are perplexed by cases such as (e.g.) your hand and its molecular parts, is

because they consider your hand and its molecular parts to be world-bound

objects. Yet on my view, these trans-world objects are merely overlapping some

of their world parts (as well as some of their spatiotemporal parts). So a case of

(purported) complete coincidence (e.g., your hand and its parts) is now seen as

mere world-part overlap. And so the Modal Objection is no longer a problem.

"But wait a minute!," you might be thinking. "Haven't you just been trying to

convince us that your hand is *identical* to its parts?! And haven't you just now

said that your hand is *not* identical to its parts (because they have different world-

parts, apparently)? Prior to this chapter, you were defending Composition as

Identity tooth and nail. Now, in order to deal with the Modal Objection, you introduce a wacky, lump theory of objects, just to get out from under the objection. Yet in so doing, you seem to have undermined your entire thesis! Why in the world did you need to defend CI—i.e., that your hand is identical to its parts—if your lump theory of objects was going to ultimately deliver the verdict that your hand is *not* identical to its parts!?"

First, let's not be mistaken. I *do* think that your hand is identical to its parts. It's just that what counts as *your hands* and *its parts* is different than you may have supposed prior to reading this thesis. Your hand has parts—it has spatial, temporal, and modal parts. We ordinarily say that your hand is identical to (just) some spatial parts, e.g., some molecules. But just because we often restrict our discourse to spatial parts does not mean that these are the only parts of your hand that there are. And even when we say this, we usually have in mind just a world-chunk of your hand—the part of your hand that is in *this* world. Your (whole) hand—the trans-world object—is indeed identical to all of *its* spatial, temporal, and modal parts. And the relation between your hand and all of *these* parts is indeed identity. But this is just to endorse CI. So endorsing a lump theory of objects in no way undermines CI; it is completely compatible with it. The only difference is that now when we are talking about parts and wholes, we have a much broader (more liberal) conception of what counts as parts and wholes. And so this may seem (at first) to undercut the radical-ness of the CI thesis. But so what? If in embracing a lump theory of objects I have thereby made CI less radical and more intuitive, then so much the better for my defense of CI.

Second, CI is concerned with what the composition *relation* is—namely, identity. The lump theory of objects is a theory about what objects *are.* As I had claimed in previous sections of this thesis, a discussion of the composition relation is quite independent of claims about what kinds of things there are in the world.[88] Sure, I might have assumed the Existence Assumption (i.e., that ordinary objects exist), and the Parthood Assumption (i.e., that these objects have parts). But these were minimal assumptions, which I later admitted could be compatible with (e.g.) an idealist world, or a material monist world. I merely wanted to assume that there were indeed parts and wholes to give us a solid foundation for talking about the composition relation. In the end, if the only parts and wholes that exist are immaterial, this shouldn't affect the CI thesis in the slightest. As long as the relation between parts and wholes is identity, then CI is true; it doesn't matter what the rest of the world is doing, or what it looks like, or whether it's material or immaterial or what.

The lump theory of objects, on the other hand, is a slightly more substantive thesis about what kinds of things there are. It boldly claims that ordinary objects are lumpy trans-world sums of spatial, temporal, and modal parts. Now, sure, I was somewhat accommodating in positing this view. If you don't like concrete possible worlds, for example, then you could have abstract world-parts as parts. If you don't like worlds at all, you could have brute modal properties as parts. If you don't like being committed to time, you could have temporal properties as parts. But as accommodating as I can be, at some point my theory makes ontological commitments: I claim that ordinary objects are

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[88] This chapter, p. 36.

mereological sums with spatial, temporal, and modal parts (how exactly you cash these parts out is of course up to you). If you deny that there are such things as spatial, temporal, or modal parts (however defined), then you will object to my lump theory of objects. Even so, the point is that my lump theory of objects is a decidedly weighty metaphysical thesis about the ontology of ordinary objects. CI is thesis about the composition relation. As such, embracing one shouldn't (in principle) undermine the other.

Finally, as should be evident in this chapter, I think that CI and the lump theory of objects are nicely suited for each other, rather than undermining of each other. If Merricks is right, then CI entails Mereological Essentialism. If I am right, then CI is true. Yet if the lump theory of objects is correct, then we can see that Mereological Essentialism is not a view to be avoided; nor is it incoherent, nor is it a view that should be outright rejected (without argument). If so, however, then this will undermine Merricks' modus tollens of CI. If Mereological Essentialism is not crazy, then it won't matter that CI entails it. We embrace CI because of the arguments I have given throughout this thesis; we embrace the lump theory of objects because of the arguments I have put forward in this chapter; and then we can embrace the entailment from CI to Mereological Essentialism, and Merricks' argument is ineffective. And, since Merricks' argument is the contrapositive of the Modal Objection against CI,[89] if we have

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[89] This point is made above, p. 3. The Modal Objection claims that the parts and whole differ in their modal properties, and so CI can't be true. The Mereological Essentialism worry claims that *if* CI is true, then the parts and wholes cannot differ in their modal properties. And so if the parts cannot survive a loss of parts, neither can the whole; thus, wholes (i.e., any object made of parts) must have their parts essentially.

rendered Merricks' argument ineffective, then we have rendered the Modal Objection ineffective as well.

Can one defend CI *without* embracing the lump theory of objects? Yes, of course. If you object to my lump theory of objects, you can still embrace CI and avoid the Modal Objection. As was shown above, the Modal Objection is a variant of the modal version of the constitution puzzles (e.g., Goliath and Lumpl, Nib and Nibbles). Suppose you already have a solution to those puzzles. Then such a solution will simply carry over to the Modal Objection. For example, one might be inclined towards a Sider-like response to puzzles such as Goliath and Lumpl. One might claim that Goliath and Lumpl are indeed identical, it's just that when we run our counterfactuals, a single object can produce seemingly distinct modal properties, depending on which counterparts we are taking under consideration. Goliath *qua* lump could survive being smushed, but Goliath *qua* statue could not, etc. But if this is the solution to the modal puzzles that you favor, then this solution will apply to the Modal Objection (against CI) as well. You could claim that, yes, (e.g.) your hand is identical to the molecules that compose it. It's just that your hand, *qua* parts, can survive being thrown in a blender, but your hand, *qua* hand, could not, etc. We simply run the analogous response that you are prepared to give in the cases of Goliath and Lumpl and Nib and Nibbles, and apply it to the Modal Objection. Then one could embrace all of the other arguments for CI that I have presented throughout this thesis. And so, this is just one way one could embrace CI, reject the lump theory of objects, and still have a response to the Modal Objection.

Another way one could embrace CI, yet not endorse my lump theory of objects, is to adopt L.A. Paul's theory of objects, which maintains that ordinary objects are fusions of properties. [90] Paul endorses a *mereological* bundle theory, and claims that objects are mereological bundles or sums of properties; as such, objects are more than mere spatiotemporal parts. This view differs from my lump theory of objects, since on my view, I need not have a view about properties, and how they are related to ordinary objects. My view merely claims that objects are mereological sums of spatiotemporal and world (or modal) parts. Whether these parts are ultimately brute properties, or some other type of (non-property) abstract bits, or concrete world-chunks, etc., is left up to your preferred ontology. Moreover, I need not definitively say whether bundle theory is correct or not, since properties need not get into the mix (if your ontology is property-averse, e.g.).[91] Also, Paul ultimately wants to reject unrestricted or universal composition (universality), whereas I embrace it.[92] Nonetheless, if one has reason to prefer Paul's theory of objects over the lump theory of objects presented in this chapter, then this would be another way to embrace CI without the lump theory, and yet still avoid the Modal Objection. Paul herself does not embrace CI (although CI *is* compatible with her view), yet she does embrace mereological essentialism.[93] And, as we have seen, since the Modal Objection is simply the contrapositive of

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[90] See L. A. Paul (2006) "Coincidence as Overlap" in *Nous*, (2006) "In Defense of Essentialism" in *Philosophical Perspectives*, and (2002) "Logical Parts" in *Nous*.

[91] I also avoid having to posit properties as primitive entities in my ontology.

[92] A bit more carefully: Paul rejects universality for fusions of properties, and allows that she could—if she was so inclined—embrace universality for spatiotemporal composition. See "Coincidence as Overlap."

[93] See L. A. Paul (2006) "In Defense of Essentialism," Philosophical Perspectives.

Merrick's Mereological Essentialism worry, anyone who embraces mereological essentialism will be able to answer the Modal Objection. So this is yet another way to embrace CI and deny my lump theory of objects.

And no doubt there are other options as well. However, my point here is simply to illustrate that CI is indeed independent from my lump theory of objects, and as such, one certainly does not undermine the other in any way. Nonetheless, I do want to commit to both of these claims in this current project. I think that embracing both of these theories delivers the most unified response to the objections and puzzles, including the modal puzzles. I hope their joint application to the constitution puzzles, to Mereological Essentialism, and to the Modal Objection has demonstrated this well.