

Do Things Persist?

Briggs Marvin Wright

University College, London

M.Phil Thesis

Submitted 1 April 2004

ProQuest Number: U643372

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



ProQuest U643372

Published by ProQuest LLC(2016). Copyright of the Dissertation is held by the Author.

All rights reserved.

This work is protected against unauthorized copying under Title 17, United States Code.
Microform Edition © ProQuest LLC.

ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106-1346

Abstract

Mereological essentialism – the doctrine that an object cannot survive the loss or gain of a part – is a much-maligned and largely disregarded view about the persistence of material objects. I aim to shore up plausibility for mereological essentialism. This is a three-fold task. I first explore the composition relation – the relation that holds between a composite material objects and its parts. I conclude that the standard account of material objects – which holds that there can be more than one material object to a place at a time – is false. I then explore how implausibility affects the various theories of persistence. Implausibility is the primary criticism of mereological essentialism, and I show that all theories of persistence are affected to some extent by implausibility. However, this fact need not grant mereological essentialism any plausibility. Some will argue that mereological essentialism is so outrageous it cannot be considered as a live candidate amongst theories of persistence. To these critics I introduce the paradox of increase. The paradox of increase presents a clear case in favor of mereological essentialism. The only way to escape the paradox is either to accept that mereological essentialism is true or to make some rather (perhaps more) spectacular claims about objects and the nature of change. While mereological essentialism may benefit from the paradox of increase, there is still much to do in the way of accommodating mereological essentialism with the nature of thinking about objects and ourselves. I conclude by laying the foundation for that work. In the end, this thesis not only shows that mereological essentialism is not absurd, but also that it is a genuine, tenable option amongst theories of persistence.

Table of Contents

Chapter 1: Three puzzles	5
“You can’t really believe <i>that</i> , can you?” Mereological essentialism explained	8
Chapter 2: Composition, identity and the standard account	14
Composition, what	14
Composition, how often? A look at the standard account	15
Why there cannot be two co-located objects	23
Conclusion	36
Chapter 3: Implausibility and theories of persistence	37
The problem of persistence	38
Theories of persistence: Two basic distinctions	42
Varieties of endurance	50
Endurantist Solution 1: Relationalism	51
Endurantist solution 2: Adverbialism	55
Endurantist solution 3: Presentism	63
Conclusion	71
Chapter 4: The paradox of increase	73
The paradox introduced	74

Rejecting (2)	79
Rejecting (4)	86
Conclusion	91
Chapter 5: What now? Some closing remarks	92
Thinking about objects	94
Self-directed thinking	97
Bibliography	102

Chapter 1: Three puzzles¹

This is a thesis on persistence and objecthood. It is an attempt to provide, through metaphysical inquiry, the proper answers to several questions. Among these, the most prominent questions are: (I) What is a (material) object? (II) Can material objects persist through change?, and more particularly (III) Can material objects persist through a change in parts? But before I begin attempting answers to these questions, let me offer some problems that surround them. These are some of the central and most interesting puzzles regarding the ontology of material objects and persistence.

This first puzzle - that of the Ship of Theseus - might seem familiar enough.²

Consider a ship made of 1,252 wooden planks. Throughout its long and distinguished career, it must be repaired and preserved. Its preservation consists in removing the damaged wooden planks and replacing them with aluminum planks. At some point all 1,252 planks have been replaced with aluminum. But to make matters more complicated, imagine that someone takes all of the original planks from the ship and constructs a ship of his own. We have then, at different times, three different ships. We have the original ship: the one composed of the 1,252 wooden planks, at time t . And we have two other ships: the one composed of the 1,252 wooden planks at time t^* , as well as the one composed of aluminum. What is the relation between the three ships? Which ship at the end of the story shall we call the Ship of Theseus?

Our intuitions drag us in different ways. After all, one ship at the end of the story has *all the same parts* as the ship at the beginning of the story. Thus, we are tempted to

¹ I would like to thank Mark Kalderon, Paul Snowdon and especially Tim Crane for their incalculably rewarding and valuable help in the production of this thesis. I am also greatly indebted to Eric Olson for allowing me to discuss his schematic argument in Chapter 4.

² As Rea (1997) points out, its history goes all the way back to the Sceptics and Stoics, with a reformulation in the work of Hobbes.

identify those ships. But the ship made from aluminum has a history that is very much linked to the first ship. What if we had not reassembled a ship using the planks that made up the original ship? Would we then be tempted to reject that the aluminum ship was indeed the Ship of Theseus? What are we to say?

We could even imagine a case like this arising in a court of law. Say that the original captain of the ship at the beginning of our story has been saving each of the planks as they are discarded and replaced with aluminum. He has reassembled them in his backyard, and is charging people admission to see “the actual Ship of Theseus”. But wait! It seems that TheseusCo. has been selling boat rides on the aluminum ship - the one they call “the actual ship of Theseus”. Who has the right to claim that they are providing customers with “the actual Ship of Theseus”? Arguments are made before a judge, and the judge renders a verdict. What makes this case a genuine problem, a genuine puzzle of metaphysics, is that no matter how the judge rules, we might still feel that there is some deep further fact, some undiscovered truth, about which ship is the real ship. And this makes it a question worth answering.

Here’s another puzzle. It’s a familiar story. Jim buys a lump of clay. He then uses that lump of clay to mold a statue of Plato, his favorite philosopher. After a few years doing philosophy, Jim is faced with the following question: What is the relation of the original lump of clay to the statue? In particular, Jim faces this pressing question: Are the statue and the lump of clay identical?

Common sense seems to dictate at least two types of answers. Let’s imagine Jim is particularly led by this sort of common sense response. Jim tells us that of course the statue and the lump of clay are identical. For there was no matter lost when we molded the statue from the lump of clay, and what more can there be to the statue than the lump from which it

is molded arranged in a certain way?³ If we just stretched out the original lump of clay, instead of molding it into a statue, we certainly wouldn't want to say that the stretched out lump was not the same as the original lump. So, Jim concludes, the statue and the lump are identical.

But the statue and the lump are not identical. Or so at least say the deliverances of Jim's common sense when coupled with some reflections on modality and the standard tenets of a theory of identity. For the statue and the lump have different persistence conditions. The lump can survive things that the statue cannot. And if we accept the assumption that if x and y are identical, then they must have the same properties (which Jim cannot see denying), we can clearly see why the statue and the lump cannot be identical. For the lump has the property of being able to survive squashing, while the statue does not. Thus, the statue and lump cannot be identical. Peter van Inwagen sums up this common sense response in the following passage.

Even if God created the statue (and, of course, the lump) *ex nihilo*, and the statue remained in existence and unchanged for a year, after which God annihilated the statue (and the lump), the lump had the property "could survive radical deformation" and the statue did not have this property. (Van Inwagen 1994, p. 97)

Jim's intuitions pull him in different directions. And once more we have a genuine puzzle.

What are we to say? It looks like it's time to do some serious metaphysics.

Consider a third puzzle. Take a bicycle. Add a bell to it. The bicycle now has a part that it did not once have. But what is the thing that has the bell? Is it the same bicycle we had from the start, or is it some other object, some new thing that has popped into existence? The original bicycle was composed of a frame, two wheels, a chain, and other

³ Of course, it could be responded that the statue bears a certain relation to, say, an artistic community, or that it represents a certain person, and thus is something more than the lump of clay. But let's ignore this response for now. For it only goes to support what I will shortly say - namely, that the statue and the lump are not identical.

parts. But it was not (partially) composed of a bell. So how can it gain a part and still be *that bicycle*? *That bicycle*, after all, didn't have a bell. Given the indiscernibility of identicals we are confronted with a rather serious problem. For the bicycle at *t* has the property: not partly composed of a bell. And the bicycle at *t** has the property: partly composed of a bell. These are contrary properties, and the indiscernibility of identicals tempts us to say that any two things with contrary properties cannot be identical. This sort of puzzle points to a general problem - how do things change? How do things gain parts? Or rather, *just how is it* that things can gain parts?

I think that these are issues that should be addressed. For if we want to allow bicycles to persist through change, we should have at hand the resources to say how two entities with (apparently) contrary properties can indeed be the same bicycle. The same goes with the Ship of Theseus. We could certainly legislate or stipulate an answer, but that just doesn't seem good enough. The hope is that some reasonable metaphysics provides answers to these puzzles. And if we want to be able to answer these puzzles, we have to provide that metaphysics. Ignoring the problem, or simply dismissing it a crazy paradox, won't make the puzzle go away.

“You can't really believe *that*, can you?” Mereological essentialism explained⁴

And so I will try to make the puzzle go away by providing an answer to it. The answer I will provide is, basically put, that an object cannot survive the loss (or gain) of a part. Thus, we get clear answers to the problems addressed above. The Ship of Theseus puzzle is dissolved, since the ship at the beginning will be identical to the ship that is made of the same planks. The ship is destroyed once it loses a plank, and comes back into existence once all the planks are reassembled. (Actually, the ship at the beginning will likely

⁴ The quotation is pretty much the response I get from anyone who hears my answer to the three problems.

only last an instant, never to return, since ours is a dynamic world in which objects are losing parts - like atoms - all the time never to regain them). And the bicycle ceases to exist (*as that same* bicycle) once we add a bell. Parts, I shall argue, are *essential* the wholes. (The puzzle of the statue and the lump is not something addressed by mereological essentialism in particular, but instead by the general account of material ontology that I provide in Chapter 2.)

I am going to defend the doctrine that parts are essential to their wholes. This doctrine is generally known as *mereological essentialism*. In what follows, I want to offer a formal characterization of mereological essentialism and a road map for the rest of my thesis, laying out the way that it shall flow and the way that it is meant to work.

Mereological essentialism is a doctrine with a fairly long history. It has been noted to be supported by various historical philosophers from Hume to Leibniz.⁵ And most recently, it has been endorsed by the likes of W.R. Carter (1983), van Cleve (1986), Michael Jubien (1993) and Dean Zimmerman (1995). But, arguably, its most famous supporter has been Roderick Chisholm. In his landmark 1976 book, *Person and Object*, Chisholm develops and endorses the view that I want to defend in this thesis.

Chisholm's mereological essentialism is basically the claim that for any x and any y, if x has y as a part, then it always has y as a part. That is, if x ever loses y as a part, then x ceases to exist. And if x does not have z as a part, it cannot gain z as a part. Thus, for any composite material object – that is, any object with parts – whatever parts it has it has essentially. This is meant to apply all the way down to the smallest parts that an object could have. Not only is the loss of a leg enough to make a particular table stop existing, but the loss of a splinter or an atom is equally sufficient. And even parts smaller than atoms are

⁵ For the relevant Hume and Leibniz passages, see Chisholm (1976), p. 221, n. 2.

essential to the existence of a particular object. Let's assume for the sake of argument that objects have smallest parts – “simples,” or mereological atoms.⁶ If my table loses any of its mereological atoms, then that particular table ceases to exist. I shall follow Chisholm in his formalization of mereological essentialism as follows. The doctrine that I have in mind in this thesis is:

Mereological Essentialism: For every x and every y, if x is ever a part of y, then y is necessarily such that x is a part of y at any time that y exists. (Chisholm 1976, p. 149)

It should be obvious that this is an extreme doctrine, and one that most people do not believe, so I shall not rehearse the obvious objections to it in detail. The objections usually share their content with that expressed in the following claims: (1) Of course objects can gain and lose parts! I lose atoms all the time! (2) My table loses legs and is still the same table! (3) And my watch can lose atoms without ceasing to exist! My defense of mereological essentialism can be seen as a threefold attempt to shore up its plausibility. In concluding this introductory chapter, then, I want to lay out the remainder of the thesis.

In Chapter 2, I look at the nature of composition – the part/whole relation. I shall explore the composition relation itself, and address when composition occurs. I shall not provide a general answer to the question of composition. That is, I shall not provide informative necessary and sufficient conditions for when the y's compose some material object x. But I shall argue against one claim about composition. According to the standard account of material objects, it is possible for there to be two objects composed of the same parts in the same arrangement at the same time. So, for instance, a statue and a lump will be

⁶ It is controversial whether material objects actually have smallest parts. There are those who believe in the possibility of “atomless gunk” – that material objects have no smallest parts. See Sider (1993) and Zimmerman (1996). Material objects, on this picture, are infinitely divisible. I am agnostic on this question. I take it that whether or not material objects are infinitely divisible is an empirical question, and thus one that I do not have the resources to answer. But mereological essentialism need not be committed to any particular view about whether there are simples or atomless gunk.

composed of the same parts in the same arrangement at some point in their careers, and thus there will be two objects at a particular place at a particular time. I shall argue in Chapter 2 that the standard account of material objects is false. For any one set of parts at a particular time (and thus in a particular arrangement), there is at most one material object that they compose. The importance of the falsity of the standard account of material objects will be apparent once we reach Chapter 4, where the defense of mereological essentialism depends crucially on the falsity of the standard account.

Mereological essentialism obviously strikes many as an implausible doctrine. And there are those who reject mereological essentialism merely on the grounds of its implausibility. It is the purpose of this thesis to shore up plausibility for mereological essentialism. If this thesis is successful, mereological essentialism will be seen as a contender for serious consideration. It is the purpose of Chapter 3 to argue that all of the currently available accounts of persistence have their own implausibility problems. Implausibility won't be a problem for mereological essentialism in particular. I shall develop "the problem of persistence" and show that no matter your solution to the problem of persistence, you will end up saying something that flies in the face of what constitutes much of our ordinary thinking about objects and change.

In Chapter 3, then, I attempt to show that implausibility infects accounts of persistence generally. However, I am sensitive to the fact that many will not be convinced that the alleged implausibility of general accounts of persistence shores up *any* plausibility for mereological essentialism. There are those who will deny that mereological essentialism deserves consideration. These objectors will believe that the implausibility of mereological essentialism is so severe that it is *prima facie* less plausible and less deserving a doctrine than any other theory of persistence. I am sympathetic to this claim, and for that reason, do not

myself attempt to claim that mereological essentialism gains plausibility from the implausibility of general accounts of persistence.

However, I think that there is a particular problem of change that shows just how reasonable mereological essentialism is. The problem of change of parts – the paradox of increase – shows just what we are committed to claiming if we want to allow for objects to gain or lose parts. If we want to reject mereological essentialism and allow for objects to gain or lose parts, then we must deny some extremely reasonable and plausible claims about objects and change generally. In Chapter 4 I lay out the paradox of increase and show how it actually supports mereological essentialism. If one wants to solve the paradox of increase by rejecting mereological essentialism, one will have to say something rather extraordinary – perhaps even more extraordinary than mereological essentialism.

Chapter 4 shows that mereological essentialism is a genuine and live option in a theory and ontology of change. But there is still much to be explained. How can we accept mereological essentialism? What are its consequences for our thinking about objects? What are its consequences for thinking about ourselves? I have something to say about the exact claims of mereological essentialism, and what it entails for our thinking about objects and ourselves, in Chapter 5. I shall show how it can actually account for and is consistent with our ordinary thought about object and self.

The thesis is an expanded attempt to defend and make more plausible the much-maligned view of mereological essentialism. On the way to its defense I explore general thoughts about composition, material objects and change. I also try to accommodate mereological essentialism within our general ways of thinking about ourselves and the world. But I do not take myself obviously to have proven its truth. In the end, this thesis shows

that mereological essentialism can be placed among the live contenders for theories of change and material ontology. And if I have been successful, you will too.

Chapter 2: Composition, identity and the standard account

In this chapter I want to address two questions of composition: what it is and whether two distinct material objects can be composed from the same parts in the same arrangement. The upshot of this section will be the claim that a material object is a single thing (a whole) composed of collections of smaller objects (the parts of the whole).⁷ This section is meant to clear the way for an understanding of the types of things we are discussing, and the types of things that they can't be, when we discuss material objects and the possibility of their persistence. It is also an attempt to preempt a possible solution to the puzzles of change that we discussed earlier. The co-location and constitution views of the so-called "standard account" will not count as viable answers to the puzzles of change since they have unacceptable consequences for the nature of material composition. But perhaps most importantly, what is established here will be used as a tool against a possible solution to the paradox of increase discussed in Chapter 4.

Composition, what

There are material objects all around. Big objects, small objects, objects that we cannot perceive with the naked eye: for instance, respectively, giraffes, gerbils, and germs. Science tells us that for each of these objects, there are smaller objects that we can break the big objects down into. For every big composite object, we can break that object down into smaller objects – its parts.⁸ The matter that a giraffe is made of can be broken down into smaller bits: the giraffe has legs, a neck, and ears as parts. And these parts have smaller parts

⁷ There are some who believe that composition either is (Baxter 1988a and b) or is relevantly analogous to (Lewis 1991) identity. That is, a whole is identical with its parts. While this is a fascinating discussion, I cannot accept that composition is identity. A whole is one, while its parts are many. So, I conclude, they cannot be identical. So composition, for our purposes, is not to be identified with identity.

⁸ This talk of "breaking down" should be taken strictly metaphorically. There are some compounds, like chemical compounds, whose parts cannot be broken down or separated. Nevertheless these compounds have constituent parts.

like molecules, cells, atoms and subatomic particles. Likewise for these smaller objects. And it is natural to understand the relation between the bigger object and the smaller ones in the following way: the bigger objects are *made up of* or *composed of* the smaller objects.

Standard pre-philosophical intuition tells us that there are many composite objects in the world. There are bicycles, babies, bugles and other composite objects. What makes an object a composite object is that it, like the objects discussed above, is made up of parts. We have a single object that stands in a certain relation to other objects – the objects that make it up. Call this relation, the relation that an object bears to its composite parts, *composition*.⁹

What are the formal properties of composition? Composition is an asymmetric relation that holds between a material object and its composite parts. For instance, it is correct to say that parts compose a whole, but not that wholes compose their composite parts. Composition is a transitive relation: if a certain set of atoms compose certain molecules, which in turn compose certain molecular compounds, then the atoms compose the molecular compounds.

Composition, how often? A look at the standard account

Composition is the relation that an object bears to its composite parts. A composite object is made up of or composed of its parts. But what I want to ask in this section is how many times can composition occur with one set of parts at a time?

I must be careful in circumscribing the exact position I want to endorse. There are two views that are similar, but importantly different, when it comes to answering the question posed above. The first view holds that all objects that share a particular set of parts

⁹ Two major questions that pervade the literature of composition have been labeled by Peter van Inwagen (1990b) as “The Special Composition Question” and “The General Composition Question”. The Special Composition Question asks what conditions must be met in order for composition to occur, while the General Composition question asks for a definition of composition in non-mereological terms. I shall not attempt an answer here to either of these questions, but for a good discussion of these questions see Markosian (1998).

are identical. Call this view *Uniqueness of Composition*. We can stipulate this view precisely in the following terms.

Uniqueness of Composition: If two objects have all of their parts in common, then they are numerically identical.

This view states that if any two objects have all of their parts in common, they are identical. I hope it is clear from the outset that I should not like to endorse this view. Why? Imagine that I take a pile of bricks, and compose from it a statue of Socrates. Then I destroy the statue, without destroying the bricks. With all and only the same bricks that I used to build the statue of Socrates, I construct a house. According to the Uniqueness of Composition, since the statue of Socrates and the house have all of their parts in common, they are identical. Statue = house. But it should be clear that the statue is not identical to the house, even if they share all of the same parts.¹⁰

There are those who accept the Uniqueness of Composition assumption above. But they only do so precisely because they can reject the claim that the statue of Socrates and the house share all of their parts. How can they do this? Leonard and Goodman (1941) endorse a principle akin to the Uniqueness of Composition assumption listed above. But when presented with a case like the statue and the house, they deny that the two objects are identical. They do this by denying that the two objects share all of their parts. The statue has a part that the house does not have, and vice versa. What parts are these?

Say that the statue of Socrates was built on Monday and was destroyed on Tuesday. And also say that the house was constructed on Wednesday. The statue has Monday parts and Tuesday parts – i.e., the statue has *temporal* parts in addition to its material parts. Likewise for the house. The house has a Wednesday part. Note that the house does not have Monday and Tuesday parts, since it did not exist until Wednesday. And the statue of

¹⁰ Cf. Johnston (1992) p. 93.

Socrates does not have a Wednesday parts, since it went out of existence before Wednesday. Thus, there is not a complete sharing of parts between the statue and the house. And thus, Leonard and Goodman can endorse the Uniqueness assumption above without holding that the statue and the house are identical. As they write:

[I]n our interpretation parts and common parts need not be spatial parts. Thus in our applications of the calculus to philosophical problems, two concrete entities to be taken as discrete not only have to be spatially discrete, but also temporally discrete. (Leonard and Goodman 1940, pp. 46-7)

So far, so good. But what if you don't want an ontology of temporal parts? That is, what if you believe, as I do, that the only parts that an object has are material (or even spatial) parts? Then it should be obvious that you should avoid the Uniqueness assumption. And I reject it on the simple grounds that I do not accept that an object has temporal parts or any kinds of parts other than the material/spatial parts that it has.¹¹ But what makes the statue and the house discrete? After all, they share all of the same parts. One possible answer is that the parts are in different arrangements. The bricks that compose the house are arranged in a house-way, and thus through that arrangement the house adopts the properties that houses are normally taken to have: providing shelter, being a house, and the like. And the bricks, when they compose the statue, are arranged in a statue-way, and through that arrangement the statue adopts the relevant statue properties. I do not intend it to be a necessary condition for the identity of an object that its parts always have the same arrangement. I believe that an object that has the same parts in a relevantly similar arrangement can be the

¹¹ For more reasons why we should reject that objects have temporal parts, see my discussion of perdurantism in Chapter 3.

same object.¹² If we move one of the statue's atoms a nanometer away from its original position, the statue that is composed is still the same statue.

The principle I am seeking to defend in this chapter has two primary components. First, it allows that identity of parts is not sufficient for identity of objects composed from those parts. A brick statue of Socrates is not identical with a house composed from those bricks. And second, it holds that what will make the difference in terms of identity for two distinct objects composed of the same parts will be a matter of arrangement of those parts. Let's call this new principle *Uniqueness of Composition and Arrangement*. This is the principle I have in mind when I attack the standard view of material objects. We can formulate it as follows.

Uniqueness of Composition and Arrangement: Numerically distinct objects can have all parts in common only if those parts are differently arranged.

Now that I've formulated my position, I can pursue my target – the standard account. A good example of the standard account is exemplified in a certain answer to one of the familiar puzzles of change.¹³ Recall the puzzle of the statue and the lump. Jim takes a lump of clay and fashions from it a statue. The lump of clay is composed of atoms A1...AN, as is the statue. How many objects do we have once Jim fashions the statue? Do we have two – the statue and the lump – or one – the statue or the lump? The standard account tells us that we have two distinct material objects, the statue and the lump.

Why believe that there are two distinct material objects? For one, our conceptual catalogue contains both statues and lumps. We believe that there are such things as statues and lumps, at least pre-philosophically. We talk about statues and lumps all the time; we see

¹² Of course, at what point the arrangement can be different enough to cause an object to cease to exist, I do not know. So I will not stipulate. I merely want to allow for that type of change – the one that occurs when I move an atom a nanometer from its original position.

¹³ Perhaps the most famous defender of the standard account is Wiggins (1968). For a comprehensive list of other defenders of the standard account see Burke (1994).

and discuss the merits of statues in museums, we (if we are artistically inclined) buy lumps of clay. But why believe that when we shape the statue from a lump we have two distinct objects? One reason is that it seems that making a statue in itself does not take the lump out of existence. By shaping a lump into a representational figure, intuition tells us, you cannot destroy the lump.¹⁴ Lumps can survive changes in shape. So, it seems, the lump exists. Also, it seems that shaping the lump into a representational figure brings something into existence – namely, a statue. Artists, intuition tells us, are in the business of creation when they are in their studios hard at work. They are not merely shifting parts of objects into different shapes.

So we have reason for believing in statues and lumps. But why believe that they're distinct? The main reason is that the statue and the lump differ in any number of properties. For instance, the statue cannot survive melting, the lump can. Imagine if someone melted down Michelangelo's *David*, and did so in such a way that all of the matter that made it up was preserved. We would mourn the destruction of a very important, very beautiful artistic creation. But the marble that composed the statue would not be destroyed. It has simply changed its shape. And pieces of marble or lumps of clay just are the kinds of things that can survive changes of shape. You didn't destroy the clay when you fashioned it into a statue; likewise you wouldn't have destroyed it had you squashed the statue that you made with the clay.

The relation that holds between the statue and the lump, at least at the moment that the statue exists, is known as *co-location* or *coincidence*. Co-location has often been put as a spatial relation; if two objects are co-located then they occupy the same space at the same time. But there is perhaps another, better way of spelling out the co-location relation. This

¹⁴ As we shall see, *contra* Burke (1994).

way is in terms of parts. To say that two objects are co-located is to say that they share all of their parts at a time.¹⁵ The reason that this way of putting co-location is to be favored is expressed by Merricks in the following passage:

It is not – as the name might misleadingly suggest – a spatial relation. One can oppose mereological co-location while happily accepting, for example, that an organism is located exactly where a region of space or an event is. (Merricks 2001, p. 39)

Merricks points out that co-location should not be seen as a spatial relation. Nonetheless, his examples are of co-location between objects and events, or objects and points of space. One could easily deny that events and points of space are objects. And so one could simply say that co-location is meant to be a spatial relation between two *objects*.

Here's a better example of why co-location is not primarily a spatial relation. Let's imagine that where I am, there is also a ghost. It seems possible that a ghost could move through me and occupy exactly the same region of space that I occupy. (Think of the many films that depict ghosts moving through people. Think especially of films that depict "near-death experiences," where the ghost of a person is at one time exactly where the person is, and then slowly levitates through and above the body.) The reason that this seems possible is that the way that ghosts occupy regions of space is, presumably, different from the way that material things occupy regions of space. Ghosts are made of something different than we're made of. (In the film *Ghostbusters*, for instance, ghosts are made of ectoplasm.) We're made of a different sort of matter – carbon based matter. A good reason a ghost and a person can be in the same space at the same time is that ectoplasm and our carbon-based matter can occupy the same space at the same time (and presumably because the ghost's constituent ectoplasm occupies the space differently from the way my stuff occupies the

¹⁵ This means that they share all of their parts, as Merricks (2001) says, at some level of decomposition. The statue may have parts the lump lacks, like, for instance, hands. They will, however, share all of their atoms. I will address later whether this move might actually make it easier for the co-locationist to avoid the objection.

same space). If you think it is possible that ghosts can be located in space, then it seems possible that a ghost could be exactly where you are.

But that fact need not be objectionable for those who reject co-location. It's not problematic merely that there are two things in the same place at the same time. It is that there are two things in the same place at the same time that occupy that space in the same way. And it seems obvious that the way an object occupies a region of space is contingent on the way its parts occupy regions of space. Since ghosts and people – on first glance at least – will not occupy regions of space in the same way, one likely explanation for the fact that a ghost and I can be in the same space at the same time is because we have constituent parts that occupy space in different ways. Statues and lumps, on the other hand, will occupy space in relevant similar ways. Statues and lumps will at some level of decomposition have all of the same parts, and those parts (being identical) will occupy regions of space in exactly the same way.

Most believers in the standard account hold that another relation between statue and lump, and any two objects in cases of coincidence, is that of *constitution*. Constitution is taken to be an asymmetric relation (unlike co-location, which is symmetric): the lump constitutes the statue, the animal constitutes the person, the aggregate of atoms constitutes the tree, but not *vice versa*.¹⁶

¹⁶ The relation of constitution has been notoriously difficult to formulate satisfactorily. For instance, Judith Jarvis Thomson (1983) once formulated constitution as mutual parthood: For all x and y , x constitutes y =df x is a part of y and y is a part of x . But it has now become apparent that mutual parthood is insufficient for constitution. For mutual parthood does not highlight the asymmetric nature of the constitution relation: on the mutual parthood account, the statue constitutes the lump, which most believers in constitution reject. Thomson (1998) has recently offered a new formulation of constitution which preserves asymmetry. Put informally, x constitutes y =df x is a part of y at t , y is a part of x at t , there exists a z which is an essential part of x at t , nothing exists that is essential to y at t , and anything that is a (big) proper part of y at t is essential to x at t .

There are even some who suggest that constitution is identity.¹⁷ They believe that whenever some object constitutes some (allegedly) other object, they are identical. In the statue/lump case, these philosophers believe that the statue and the lump are identical. But there are good reasons for rejecting this move. First, if you accept that there is both a statue and a lump composed of the same parts, it should be transparent to you that statues and lumps are different kinds of thing. And this is for the reasons mentioned above: statues and lumps (if they exist) have different *de re* modal properties (the lump, but not the statue, can survive squashing or melting), different *de re* temporal properties (for instance, in a case where the lump was made into a statue, the lump has a longer history than the statue) and different *de re* kind properties (the statue and the lump are different kinds of things). And if we accept that the statue and the lump do have these different properties, then we are forced to accept that they cannot be identical since identicals must have the same properties. So I conclude that if x is constituted by y, and x and y have different properties, then x and y cannot be identical.

I have isolated the primary element of the standard account that I want to attack. I do not pretend that this is the only element of the standard account meriting discussion, but I need not for my purposes go into all of its various subtleties. I simply want to make serious trouble for its claim that there can be two distinct material objects – like the statue and the lump – that share all of their parts in the same arrangement at a time. This is the essence of my Uniqueness of Composition and Arrangement claim, and in what follows, I want to spell out exactly why it should be heeded. I will provide arguments in the next section that demonstrate exactly why the standard account's ontology of co-located distinct material objects must be avoided.

¹⁷ See, for instance, Lewis (1971) and Noonan (1993).

Why there cannot be two co-located objects

In this section, I shall argue that there cannot be two co-located objects, where by “co-located objects” I mean objects that share all of their parts in the same arrangement (at the same time). There are two arguments, the first charging the standard account’s ontology with a needless multitude of causal explanations. This is an objection that I hold the co-locationist can reject. But there is a second one that I find much more convincing. This objection focuses on the seeming inability of the standard account to ground differences in persistence conditions between the two co-located objects. I shall consider possible co-locationist responses to this charge, and in the end reject them as inadequate. In the end, I shall conclude that there can only be one object composed from a set of parts in a particular arrangement.

The causal powers argument

I shall here focus on whether or not the standard account runs into problems with causal explanation by positing two objects composed of a single set of parts in a particular arrangement at a time. Consider the following passage:

There is another worry with the claim that a statue is co-located with a numerically distinct lump. This claim seems to imply – as far as causal explanations are concerned – a *needless multiplication* of physical objects. For the lump, once we have the statue, seems to bring no new causal powers into the world. Likewise, it seems that everything the alleged statue causes would already be accounted for by the work of the statue-shaped lump, which everyone treats as if it were a statue. (Merricks 2001, p. 40)

This argument appeals to the intuitive idea that we need not posit two objects where we can have one in cases where no new causal powers are possessed by the second posited object. We don’t *need* two objects since the causal powers are exhausted and explained by the existence of one thing.

Let me explain. Take a dog. Let's say that you claim that where the dog is there is also a barker, which is a distinct material object from a dog. I ask you why I should accept the existence of the barker as well as the dog. You tell me that the barker does things – it has all sorts of causal powers. It fetches balls, barks, and does all the things that the dog does. But why should we accept the existence of the barker when the existence of the dog accounts for everything the alleged barker causes? It seems like a needless double counting.

You might think that these considerations don't apply to the case of the statue and the lump. For we have good reason for believing in statues. We don't have good reason for believing in barkers. Barkers seem like members of a bogus or gerrymandered kind, whereas a statue seems like a member of a genuine artifactual kind. There is a consensus (or at least majority agreement) that statues exist, and so our convergence of agreement as to their existence (it seems) counts in their favor. And what's more, you might be dubious about metaphysical arguments that appeal to explanatory simplicity in the first place. I am sympathetic, and will address these concerns below.

Why should *anyone* accept this causal powers argument, or anything like it? It gains plausibility when examined in the light of a reasonable assumption about causal powers known as "Alexander's dictum". Alexander's dictum was originally formulated (by British emergentist Samuel Alexander) as an attack on mental epiphenomenalism – the view that the mental is causally inefficacious on the physical. Jaegwon Kim quotes Alexander's dictum in the following passage:

[Epiphenomenalism] supposes something to exist in nature which has nothing to do, no purpose to serve, a species of *noblesse* which depends on the work of its inferiors, but is kept for show and might as well, and undoubtedly would in time be abolished. (Alexander 1927, p. 8; repr. In Kim 1993 p. 348)

The lesson Alexander teaches is this: if some purported existent does not have causal powers then we should not accept its reality. But this lesson initially does not have any effect on our

acceptance of statues and lumps. Both of these have causal powers. The lump causes certain visual experiences. As does the statue. But we now arrive at this question: Might the statue's causal powers be accounted for by the causal powers of the lump (or vice versa)? This is the intuition that Merricks pushes above. The statue causes appreciation in its audience in virtue of its constituent parts producing a visual experience in the audience, which in turn causes a sense of appreciation. But if we accept that the lump exists, we could just as easily say that the lump causes this experience in virtue of its constituent parts producing the visual experience, which in turn causes the appreciation. We could suggest, then, that the causal powers of the statue (if it exists) just are the causal powers of a statue-shaped lump (or vice versa). Kim has re-formulated Alexander's dictum to reflect this intuition:

To be real, Alexander has said, is to have causal powers; *to be real, new, and irreducible, therefore, must be to have new, irreducible causal powers.* (Kim 1993, p. 350)

The question, then, is whether or not we ought to say that there are two things – two distinct material objects – where we have one set of causal powers.

One worry about this argument is its implicit appeal to Ockhamite reasoning: If a particular phenomenon has two explanations, choose the simpler one. And so this reasoning, when applied to causal powers, tells us that when there are two alleged existents that share all of their causal powers, whose whole causal abilities can be explained solely by appeal to a single entity, we ought to stick with a single entity. We ought to eliminate one of the alleged existents from our explanation. Perhaps this theory has its appeal when comparing certain types of explanation, but it isn't clear that this is the case generally. For instance, you might think an explanation of a single sock missing from my wash that appeals to tiny invisible sock-hoarding demons is a bad explanation. And you probably think it's worse than one that appeals to the socks getting trapped within the machine. But this is not

necessarily for reasons of simplicity. Arguably, it is partially because the former explanation appeals to existents in which we have no reason to believe. Invoking them might provide a solution to the puzzle of my missing sock, but it seems there are better explanations, namely those that appeal strictly to entities we have reason to believe in. But in the statue/lump case, it isn't as though we are making some absurd appeal to an alleged existent whose reality is dubious. Instead we are talking about things that we take to exist. This isn't of course to say that there might not be fewer things in heaven and earth than our folk ontology posits. It is only to express the truism that by appealing to lumps and statues in our causal explanations, we are not being absurd. And so the Ockhamite reasoning that runs through this causal powers explanation is indeed contentious at best, and something that the co-locationist is entitled to reject.

And of course, in response to the general tenor of the causal powers argument, which asks why we should posit two entities whose causal powers could be fully explained by appeal to merely one, the co-locationist can offer this ready response: "This isn't like the dog and the barker. We have a reason to posit both the statue and the lump!" They are different kinds of thing, and kinds of thing to whose existence we are committed. And, moreover, being different kinds of thing, they have different persistence conditions. The statue cannot survive squashing, but the lump can. This is, I believe, a good first response to the causal powers argument, and one that the co-locationist could exploit.

But this concession does not mean that the co-locationist is right. For even if you doubt the validity of the causal powers objection, the considerations in the next section will show that we do have good reason to doubt that there are (or even could be) two distinct co-located material objects, even in cases where the belief in the entities themselves is not ridiculous or absurd.

*The supervenience argument*¹⁸

In this section, I will claim that we have another reason to deny that there are two entities that share all their parts in the same arrangement at the same time. Wasserman offers a good summary of the supervenience argument below.

[A]ccording to the standard account, Lump and David share the exact same spatial location whenever they both exist. But it also seems as if they share the exact same *parts* whenever they both exist. In particular, they have all of the same *microphysical* parts in exactly the same arrangement whenever they both exist – Lump and David have the exact same *microphysical structure* at those times. But the standard account also has it that Lump and David differ in their *de re* temporal properties, *de re* modal properties, kind properties and so on. So the challenge for the defender of the standard account is to explain how such differences are possible, given that Lump and David have the exact same microphysical structure whenever they both exist. The standard objection has it that no such explanation can be given and that the standard account must therefore be rejected. (Wasserman 2002, p.198)

The basic idea is that it is difficult to understand how two entities that share the exact same parts at the same time (and thus in the same arrangement) could possibly differ in their various properties. And the onus is on the defenders of the standard account to explain how this is possible. But a satisfactory explanation has yet to be found.

Recall the position that I am seeking to defend in this chapter: Uniqueness of Composition and Arrangement. According to this position, numerically distinct entities can have all the same parts only if those parts are in distinct arrangements. We can understand this supervenience objection, then, in the following terms. According to the standard account, it is possible for there to be two distinct entities occupying the same place at the same time. And thus, it seems, it is possible for there to be two distinct entities sharing all of the same parts in the same arrangement. They share all the same parts because they're made of the same basic stuff (recall that composition is transitive). And since they're made of the

¹⁸ This particular name for the argument comes from Rea (1997). Zimmerman (1995) presents a similar problem called “the grounding problem” while Olson (1997) refers to it as “the indiscernibility problem”. They are at heart the same argument pressing the same intuitions.

same stuff at each time they occupy the same space, that stuff will be arranged in the same way. But how is it that two distinct entities composed of the same stuff arranged in the same way could possibly have different persistence conditions? Since they're made of the same stuff, wouldn't we expect both entities to be able to survive the same event?

We can bring out the strength of this objection by appeal to the following example. I have a dog, Spot. Spot has always been a good dog, though at times he can get banged up when he chases cars. When he last chased a car, he broke his paw. I was worried about my buddy Spot, and just in case he were to meet with a tragic accident, I figured I'd want another dog to keep me company. And I'd want that dog to be just as much like Spot as possible. So I create an atom-for-atom duplicate of Spot (the atoms are arranged just like Spot's are as well). I call this dog Spat.

I take Spot and Spat down to the drag racing track. (We assume that throughout their entire careers their atoms are in qualitatively identical positions.) Side by side the two racing vehicles (duplicates of one another) rev their engines. Spot and Spat dash onto the track, Spot in one lane and Spat in the other. Spot stands in the qualitatively identical spot as Spat in their respective lanes, each the same distance away from the driver in its lane. The drag racers take off, going at qualitatively identical velocities, in qualitatively identical trajectories. They hit Spot and Spat in qualitatively identical locations. (They didn't see the dogs; they're not malicious drivers!)

What happens to Spot? It's pretty bad. Spot's broken a few ribs. With all of this information, what should I expect to happen to Spat? A few broken ribs, right? Why exactly is it that we suspect Spot and Spat endured the same trauma? Here's one answer: because they're things of the same kind. But here's a better, more informative answer. They are made of qualitatively identical stuff, arranged in the same way, and they endure

qualitatively identical accidents. Whatever happens to Spot should happen to Spat when they are in such similar circumstances. Why? At least part of the reason is that the damage that they endure seems to supervene on the specifics of the accident and the particular constitutions of the dogs. They have qualitatively identical bone structure, and so we should expect the same fragility of bone given the circumstances of the accident. (This qualitatively identical bone structure is due to their having qualitatively identical parts in a qualitatively identical arrangement.) And this appeal would explain why Spot's accident would be different from that of a dog with a different bone structure and different material constitution, or from Spat's accident if the driver who hit Spat was going 10km/h slower than the driver who hit Spot.

But perhaps even more telling is the fact that if there were a difference between Spot and Spat's injuries, and the circumstances were exactly the same as in our original tragic scenario, we would seem to have no explanation for the difference. It would be utterly mysterious why Spot and not Spat suffered broken ribs in qualitatively identical accidents. For the injuries seem to depend primarily (if not exclusively) on three things: the specifics of the drag racing cars, the specifics of Spot and Spat's material constitution, and the specifics of the accidents (e.g. the speed at which the cars were going, where the dogs were hit and what part of the car hit them).

How is this analogous to our statue and lump case? They too are made of the same parts in the same arrangement at the time of squashing. (This particular claim shall be challenged below, but let's assume it for the time being.) And since they are made of numerically identical – not just qualitatively identical – stuff, the point is meant to apply *a fortiori*. As Merricks says:

Similarly, some philosophers object to co-location of the statue and the lump since it seems like their qualitatively (because numerically) identical microstructure should

rule out their having different persistence conditions. And because co-located objects are invariably supposed to differ in persistence conditions, we here have a reason to object to co-location itself. (Merricks 2001 pp. 39-40)

The problem is even worse for the statue and the lump than it is for the two qualitatively identical dogs. For while Spot and Spat have qualitatively identical microstructure, the statue and the lump have a *numerically* identical microstructure – they have the *same* microstructure. And while Spot and Spat might differ in certain relational properties, the statue and the lump (while co-located) have *all* properties in common – all except those that make people think there are two different objects, namely, the *de re* modal, temporal and kind properties. But how could that be? How could two different things with the same microstructure have different persistence conditions?

At this stage we have what seem to be two competing explanations for the source of particular modal properties possessed by certain objects. According to the co-locationist of the standard account, the modal properties of a particular object are generated by the kind properties that the object instantiates. And according to the line that I have been pushing, the modal properties supervene more clearly on properties of the microstructure of the object. At this stage in the argument, the co-locationist will respond to my demand for an explanation in differences of modal properties. The answer will follow this format: “Since the statue and the lump are *different kinds* of thing, whereas Spot and Spat are not, we have reason to believe that one could survive something that the other could not. That is the nature of kinds. They generate persistence conditions relevant to that kind.”

What is up to the objector at this point is to develop some sort of account that challenges the (standard account) co-locationist’s intuitions about the origin of modal properties. There are two ways to proceed. The first way is to find a better origin for modal

properties than kind membership. A second way is simply to deny that there is an origin for modal properties.

How might we suggest that there is a better origin than kind membership for modal properties? I have hinted above that facts about the microstructure of material objects provide a better origin. Let's further explore this claim by returning to our original example. Say that Spot is a beagle. Replace Spat with another dog, a St. Bernard. The bigger dog, we expect, should sustain less severe injuries than the smaller dog were they to undergo the same trauma. St. Bernards are bigger than beagles. So in the same accident, Spot would be worse off than the St. Bernard. Rerun the accident with the St. Bernard in Spat's place. Who suffers a worse fate, Spot or the St. Bernard? As we have guessed, it should be Spot. But how should we explain the fact that Spot's injuries were more severe than the St. Bernard's in qualitatively identical accidents? Because they're different kinds of thing? That's certainly one explanation. Here's another: the difference in material constitution of the two dogs. The St. Bernard is much bigger than Spot, and that explains why his ribs were not broken and Spot's were.

The same goes if we replaced the St. Bernard with a tree. The uninformative explanation would be that the difference in damage done to Spot and that done to the tree has to do with their being things of different kinds. The informative explanation would be to appeal to the differences in material constitution, e.g. how the tree is stronger than the dog because of its matter and the arrangement of that matter. We can exploit this sort of suggestion across the board. In both the tree and the St. Bernard cases, the greater strength will supervene on basic facts about the stuff they're made of and how it's arranged.

The idea behind kind-membership generating persistence conditions seems to be the claim that there is a good analysis of what it is for some entity to be a member of some kind

K. And with knowledge of what the kind is, we can discover what persistence conditions there are relevant to that kind. Consider this passage:

There is some analysis or other of being a member of kind K; that analysis – whatever it turns out to be – will deliver informative necessary and sufficient conditions for being a member of kind K; that analysis will therefore deliver “criteria” for being a member of kind K; that analysis, therefore, will issue in criteria of identity over time for members of kind K. (Merricks 1998, p. 113)

The first way I have expressed of challenging this suggestion is simply to deny that knowledge kind membership can deliver these persistence conditions. While there might be a successful analysis of what it is to be a member of some kind K, there is reason to doubt that this analysis will likewise generate persistence conditions for that kind. And one reason, as I have tried to bring out, is that it seems more informative explanations for differences in persistence conditions could be found by appealing to facts of material constitution. Kind membership facts tell us lots of things: for example, what sorts of things can or cannot be members of a kind K. An analysis of the kind “sparrow” will tell us, for instance, that flightless animals with fur and four legs are not sparrows. In other words, a kind membership analysis seems to do a good job of telling us whether some entity at time t is a sparrow. But it doesn’t necessarily seem a very good mark (or at least any better than any other account at hand) for telling us when some sparrow at time t is the *same* sparrow as some sparrow at time t^* .

Of course, the standard account co-locationist need not be troubled by these claims. He can simply say that on some level of explanation, appeal to kind membership will *seem* uninformative. But that will do nothing to take away from the fact that what generates persistence conditions is kind membership.

Nevertheless, I think there is a more plausible strategy for attacking the co-locationist’s claim about persistence conditions. The standard account co-locationist wants

to argue that an object's modal properties are determined by the sortal that it satisfies or the kind to which it belongs. And I have suggested that persistence conditions might best be seen as determined by something like an object's microstructure. At least I have suggested that a better explanation of differing persistence conditions is made by appeal to something like material constitution or even microstructure. But both of these explanations share a common intuition: that the modal facts of an object are in any way determined by other facts.

But might this intuition be resisted? Perhaps the modal facts of an object are just *brute*.¹⁹ That is to say, perhaps there are not informative necessary and sufficient conditions such that these facts generate persistence conditions. Modal facts just might be the kinds of facts that have no more basic *explanans*. That the statue of David might not be able to survive a certain alteration depends on how meager its essence is. And that its essence is meager need not be a fact that is in any way related to any other facts. It might just be a brute fact.

Or perhaps the modal facts are not brute, but rather their explanation is something beyond our ken. Perhaps we could never discover what underlies the modal properties something might or might not have. Thus, whether or not the statue of David can survive a certain alteration might well be a matter of some other contingent facts about it. As I have tried to bring out, there are at least two sets of facts that *could* be relevant to David's modal properties: kind membership and material constitution. Which of these facts are relevant to David's modal properties might just be something beyond our ken. Either is a good guess. But one could be wrong. In fact, both guesses could be wrong. The modal properties of David might well be dependent on some set of facts that we haven't considered, or on some

¹⁹ For more on "brutality" of certain facts, see Markosian (1998).

set of facts that we just can't consider (because of our limited intellect). At any rate, it's an open possibility that the modal properties of David are either brute or dependent on facts beyond our reach. Thus, we could adopt a healthy skepticism toward the claim that kind membership obviously determines modal properties.

So while we may not be able completely to reject the move from kind membership to persistence conditions, we can at least say two things. First, we can maintain that a more informative answer regarding differences in persistence conditions is found in appeals to difference in material constitution. And second, we can simply hold that facts of modality are brute – that nothing, not even kind membership, will provide us with an informative answer regarding how objects are distributed across possible worlds – or that these facts are (either merely currently or always and forever) beyond our ken. This is a noble skepticism about the claim that kind membership generates persistence conditions, and one that deserves further development. And while I will not develop this claim here, I will endorse it as a possible explanation for why we should resist the claim that kind membership generates persistence conditions for objects.

What is left for the co-locationist to say regarding the objection that same parts/same arrangement means same persistence conditions? As far as I can tell, the only option that the co-locationist has is simply to deny that the statue and the lump share all of their relevant parts. This is initially plausible. Statues have parts that lumps do not have – hands and a head, for instance. Thus, when the statue and the lump are co-located, the co-locationist might claim that the statue and the lump don't in fact share *all* of their parts. Likewise for a tree that is co-located with the aggregate of atoms that compose it: the tree has branches and limbs as parts, but the aggregate does not.

This appeal, while initially intuitive, is cold comfort in the end. Recall that composition is transitive. What is the hand of the clay statue composed of? Pieces of clay. And the lump undoubtedly has pieces of clay that compose it. Which ones? The very same ones that compose the statue. The existence of parts that the statue has that the lump lacks, then, depends on the existence of parts that the two share. If it weren't for the pieces of clay, there wouldn't be any hands for the statue to have to begin with.

Even while the lump doesn't have hands, it does have all the parts that existence of (clay-statue-) hands depends on. And it seems plausible to suggest that damage (or alteration) to the statue's hand would go hand in hand with damage (or alteration) to some subregion of the lump. If we bend the fingers of the clay statue, we have also done something to the lump: namely, we have moved its clay parts to a location they didn't previously occupy. And perhaps even more important, the alteration to statue-specific parts is to be *explained* at least in part by changes in the bits of clay. There is no movement of the clay hand without movement of the bits of clay that compose the hand.

This appeal to there being parts had by the statue that the lump lacks does not answer the problem it was set to address. The statue and the lump share the parts relevant to and determining the changes that might occur in both. And thus the mere fact that the statue and the lump do not share *all* of their parts at some macro-level does not mean that they do not share all of their parts at some lower level. And so we can reject this move, and say that:

Co-location does not require the sharing of all parts, but only of all parts at some level or other of decomposition. So the statue and the lump would be co-located if they were composed of, for example, exactly the same atoms. (Merricks 2001, p. 39)

Conclusion

The big problem with co-location, then, is that it cannot satisfactorily ground the difference in persistence conditions between two objects that share all of their parts (at some level of decomposition). And since it was the very idea that the two objects had different persistence conditions that led the co-locationist to accept two objects made from the same stuff in the same arrangement, this gives us reason to deny his claim.²⁰ So I conclude that unless the parts are in different arrangements, objects with the same parts are numerically identical. And since this is crucially opposed to the very essence of the standard account – which holds that composition can occur (at least) twice given one set of parts at a time – I must reject the standard account.

This is an important conclusion for two reasons. First, it affords us a better understanding of what we are and are not talking about when we speak of material objects persisting through time. But perhaps most importantly, this kernel of knowledge figures crucially in Chapter 4, where the argument in favor of mereological essentialism requires that there be at most one object at a place and a time (or, rather, one object per set of parts in a particular arrangement). But before I offer the argument in favor of mereological essentialism, in the next chapter I want to address what has been seen as the most fatal objection to it. In the next chapter we shall discuss the charge of implausibility and theories of persistence.

²⁰ I think this is both a reasonable and a common assumption. Reasonable because I take the supervenience argument to be convincing and conclusive. Common because it is an assumption adopted by many philosophers: see, for instance, Sider (2001), van Inwagen (1990) and (2001), Burke (1994), Merricks (2001), Olson (1997), Zimmerman (1995). Its reasonability, I take it, is bolstered by its commonality.

Chapter 3: Implausibility and theories of persistence

There is a problem of persistence. It is a problem that runs deep and has no easy answer. It is this problem of persistence that precipitated my gravitation toward mereological essentialism. The goal of this chapter is to show that the problem of persistence forces us to reject at least one datum of common sense. Thus, any theory of persistence over time that tries to face the problem will suffer from sort of counterintuitive result. Mereological essentialism faces it (in particular by claiming that objects cannot gain or lose parts), but so does *anything* that tries to solve the problem instead of outright ignoring it. The end result of this chapter isn't to show that mereological essentialism is true. Just because all solutions to the problem of persistence have problems, we certainly cannot conclude that mereological essentialism is true. It too faces problems. Rather, the upshot of this chapter is simply to clarify just how difficult the problem of persistence. And thus, we can see the aim as a further attempt to shore up plausibility for mereological essentialism. It is a doctrine with few friends, and in this chapter I shall try to make it more popular.

But then again, some might claim that no matter how implausible any particular theory of persistence is, mereological essentialism is *prima facie* more implausible. I understand this feeling and appreciate it. Therefore, I accept that many people will find that this chapter does nothing to support mereological essentialism. And to these people I can only suggest that they refer to the following chapter. It is not the purpose of this chapter to show the relative plausibility of mereological essentialism in the face of the problem of persistence. Rather, it is simply to show that the problem of persistence forces us to say something we might not have wanted to say about objects, change or properties. Mereological essentialism is a doctrine that is similarly problematic. But I shall argue in the next chapter that mereological essentialism enjoys an argumentative advantage when it

comes to accounting for one particular variety of change: growth and diminishing. Thus, the point of this chapter is somewhat limited. This chapter asks us simply to appreciate the problem of persistence and how it creates puzzles for our ordinary understanding of objects and change.

The problem of persistence

The focus of this chapter is the problem of persistence. What is the problem? Basically put, our common sense thinking about persistence reveals several assumptions about what we take persistence to consist in. However, we can show that all of these underlying assumptions lead the dark way to contradiction. What are we to do? If we ignore the problem, we keep an account of persistence that, while consistent with our common sense thinking about how objects persist through time, is contradictory. If we face the problem, we must reject at least some piece of common sense. Sally Haslanger has offered an elegant passage that reveals the underlying assumptions of our common sense picture of persistence.

Suppose I put a new 7-inch taper on the table before dinner and light it. At the end of the dinner when I blow it out, it is only 5 inches long. We know that a single object cannot have incompatible properties, and being 7 inches long and being 5 inches long are incompatible. So instead of there being one candle that was on the table before dinner and also after, there must be two distinct candles: the 7-inch taper and the 5-inch taper. But of course the candle didn't shrink instantaneously from 7-inches long to 5 inches long; during the soup course it was 6.5 inches long; during the main course it was 6 inches long; during dessert it was 5.5 inches long. Following the thought that no object can have incompatible lengths, we must conclude, it seems, that during dinner there were several (actually many more than just several!) candles on the table in succession. (Haslanger 2003, pp. 315-16)

This passage is rich and dense. And what is most important, it contains assumptions that seem constitutive of the common sense reasoning we employ when thinking about persistence. But let's do some work. What exactly are these assumptions?

The general underlying assumption at the start of the selection is the very idea that things can persist through change. Normal thinking about persistence suggests that objects persist through change. Candles shrink when they are lit, and yet the candle lit persists through the shrinking. A second idea that runs through this passage is that the properties instantiated in cases of change are incompatible properties. As Haslanger says, the two different lengths that the candle has over the course of the dinner are incompatible. No object can be both 7-inches long *and* 5-inches long. To be 5-inches long is simply incompatible with being 7-inches long. It *rules out*, so to speak, being 7-inches long. Nothing changes by going from being 7-inches long at one moment to being 7-inches long at the next moment. That is *stasis*, not *genuine change*. Being 5-inches long rules out being 7-inches long because to be 5-inches long is precisely not being 7-inches long (or any other length except 5-inches long). And since being 5-inches long rules out being 7-inches long, nothing can be both 5-inches long and 7-inches long. (And thus, we are obviously invoking the law of non-contradiction in this passage. This is the principle from which, given the other facts involved, the passage concludes that there are many, not one, candles during dinner.) Another assumption in the passage is that the object that exists before the change is the object that exists after the change – that is, the object that is 7-inches long is supposed to be *numerically identical* to the object that is 5-inches long. We think that there is one object that persists through change; the same candle that is lit is the candle whose flame is extinguished at the end of dinner. A final assumption needed to get a contradiction going, and one that is certainly present in this passage, and in most thinking about persistence, is that the candle itself is the object that has the properties involved in change. It is not merely a part of the object, but the object itself, that is 7-inches long at the beginning of dinner, and 5-inches long at the end of dinner. As I will show shortly, these assumptions underlying our

common sense thinking of change are enough to get a contradiction. But for clarity's sake, let's formulate these assumptions more clearly. Again, Sally Haslanger offers a clear account of these assumptions. She labels and describes them as follows.²¹

- 1) **Persistence condition:** Objects, such as a candle, persist through change.
- 2) **Incompatibility condition:** The properties involved in a change are incompatible.
- 3) **Law of non-contradiction:** Nothing can have incompatible properties, i.e., nothing can be both P and not-P.
- 4) **Identity condition:** If an object persists through a change, then the object existing before the change is one and the same object as the one existing after the change; that is, the original object continues to exist through the change.
- 5) **Proper subject condition:** The object undergoing the change is itself the proper subject of the properties involved in the change; e.g., the persisting candle is itself the proper subject of the incompatible properties.

Let's redescribe our above example so that we can see exactly how these conditions of change – these assumptions that underscore our thinking about persistence – together contribute to a seeming contradiction. I light the 7-inch candle before dinner. After dinner, the candle is 5-inches long. The candle, by (1) persists through the change. Since it is going through change, the properties involved, by (2), are incompatible properties. The candle goes from having one property to having another, incompatible property over the course of the dinner. By (4), the candle at the beginning of dinner is numerically identical to the candle after dinner. They are the *same candle*. The candle itself, by (5), is the subject of the properties [being 5-inches long] and [being 7-inches long]. This should give us pause. If there is a single thing that is both 5-inches long and 7-inches long, then we have violated (3). Since we know by (2) that the properties involved in the change are incompatible, and by (4) and (5) that the candle itself has these properties, and the candle that has each of these properties is *the same* candle, it seems we have the problem of claiming that the same object has two incompatible properties. And since we accept (3), we have a contradiction.

²¹ See Haslanger (2003), pp. 316-7

Trenton Merricks (1994) has offered a clear formalization of the problem as follows.²² I shall adapt it to our case. To simplify things slightly, let's change our example to a case in which our candle is, before dinner, straight and, after dinner, bent. In the formalization I will state exactly which premises and assumptions are justified by our conditions of persistence above. Here, again, is the problem:

- (1) *Candle* at *t* (before dinner) is identical with *Candle* at *t** (after dinner). (Assume for reductio. Identity Condition).
- (2) *Candle* at *t* is straight. (Premise. Proper subject condition.)
- (3) *Candle* at *t** is not-straight. (Premise. Proper subject condition and Incompatibility condition)
- (4) If *Candle* at *t* is identical with *Candle* at *t**, then *Candle* at *t* is *F* if and only if *Candle* at *t** is *F*. (Indiscernibility of Identicals, Law of non-contradiction)
- (5) *Candle* at *t* is bent and it is not bent. (RAA [(1), (2), (3), (4)], violates Law of non-contradiction)

What are we to do? It seems that our only resort is to reject one of the assumptions that justifies the reasoning that yields contradiction. And as Haslanger puts it, this means that we have to make one of the following claims.

- not-1) Objects such as the candle do not persist through change; or
 - not-2) The properties involved in the change are compatible after all; or
 - not-3) Objects can have incompatible properties, i.e., things can be both P and not-P; or
 - not-4) An object may persist without continuing to exist; or
 - not-5) An object undergoing change, such as the candle, is not the proper subject of the incompatible properties involved in the change.
- (Haslanger 2003, p. 317)

Before I continue, I should make it clear that mereological essentialism does not strictly call for not-1, though not-1 is the closest in spirit to mereological essentialism's solution to puzzles of change in general. But mereological essentialism isn't a claim about change in general. Rather it is a claim about a subset of the varieties of change. It is a claim about change in parts. In what follows, it will be clear which solution I prefer to problems of change of properties - presentism. But I shall argue that even that solution cannot properly

²² See Merricks (1994) p. 168.

accommodate this special subset of types of change – change in parts. In the next chapter I shall present an argument that attempts to show that objects cannot change parts. It is merely the point of this chapter, however, to argue that mereological essentialism cannot simply be faulted for its counterintuitive results. (Of course, one might argue that mereological essentialism suffers from a more severe implausibility. As I have noted, I appreciate this objection. It is the point of the next chapter to answer it.) Any theory of persistence must, to avoid contradiction, reject (at least) one of the intuitive assumptions underlying our thinking about change or otherwise make similarly implausible claims.

Theories of persistence: two basic distinctions

The theories that attempt to tackle the problem of persistence are, obviously, theories of persistence. In this section I want to discuss the two primary competitors in the broadest conceptions of persistence. These two theories are known as *endurance* and *perdurantism*. The primary upshot of this section is to show how perdurantism solves the problem of persistence by giving up on (5), the proper subject condition, above. I shall show exactly what the drawbacks of rejecting (5) are, and why they should be seen as costs in a general account of theories of persistence.

The primary issue at hand is what it is for something to persist. Let's say that something *persists* if it exists at more than one time. To say that something persists suggests continuity between the two times the object in question exists – something that persists from Monday to Friday exists Monday, Friday, and all the days in between.²³ If my computer persisted from yesterday to today, that means it existed yesterday and today. This

²³ I say 'suggests' rather than 'implies' since it seems possible the same object could persist by existing on Monday and Friday, but not on Tuesday, Wednesday, and Thursday.

says nothing about *how* things persist. There are two main theories about how things can persist. Following Lewis (1986), let's call these two ways of persisting *enduring* and *perduring*.²⁴

Things are spread out in space. You have parts down where your shoes are and below where your hat is. The computer that I am using has parts that my fingers are touching and parts that my fingers aren't touching. We occupy a region of space by having different parts in different places in space. *Perdurantism* – the view that objects persist by perduring – draws an analogy with how objects are spread out in space to explain how objects persist.²⁵ According to perdurance, objects persist by being spread out in time. You have parts back in the past and ahead in the future, as well as right here in the present. My finger is merely a part of me, not the whole of me. Likewise, the thing that occupies the space I occupy now is merely a part of me, not the whole of me. I have parts in the past and the future: call these *temporal parts*. What it is for me to perdure is for me to exist at different times by having temporal parts at these times.

Perdurantism implies that objects are not *wholly* present at any particular moment that they exist. At any particular moment, the whole of an object does not exist; only a *part* of it does. On this view, objects are four-dimensional beings that are composed of not only the spatial parts they may have, but the temporal parts that they have as well. We can consider each moment to contain a temporal part composed of certain atoms. A four-dimensional entity is composed of each of these temporal parts.

An easy way to characterize *endurantism* – the view that objects persist by enduring – is simply as a denial that objects have temporal parts.²⁶ Endurantists reject the analogy that

²⁴ Lewis (1986) notes that he derives this terminology from Johnston.

²⁵ Defenders of this view include Goodman (1951), Lewis (1986), Quine (1960) and (in a way) Sider (1997) and (2001). Sider's view - stage theory – isn't quite perdurance, but it is close enough for our purposes. For a more complete list see Sider (2001) p. 3, n.2.

²⁶ Defenders of this view include van Inwagen (1990a), Merricks (1994) and (1995), and Zimmerman (1998a).

the perdurantist draws between how objects occupy space and how they persist.

Endurantists deny that objects have temporal parts. The only parts that an object has are the spatial/material parts that it has. But there is more to endurantism than a mere rejection of perdurantism. According to endurantism, objects persist by being “wholly present” at each moment at which they exist. So, if an object endures from one time to another, it is wholly present at both times (or perhaps better, it is wholly present at every moment between any two times). What does being “wholly present” amount to? The clearest formulation of being wholly present is expressed in terms of the parts that an object has that exist at a certain time: An object *O* is *wholly present* at a time if and only if *all* of *O*'s parts exist at a time.²⁷ An enduring object is wholly present in the sense that at each moment it is present, *all* of its parts are present at that moment. So there is nothing that is a part of some enduring object that does not exist at any particular time that the enduring object exists.

To see how this formulation of being wholly present preserves endurantism's distinctive flavor is to see how it clashes with a primary claim perdurance makes about the parts that an object has. Consider some four-dimensional object that exists at the present moment. Recall that a four-dimensional object persists by having temporal parts at each time it exists. Only the four-dimensional object's present temporal part exists *at the present moment*. It has past temporal parts that exist in the past, but not now, and likewise, it has future temporal parts that exist in the present, but not now. Thus, it has parts that do not exist at the moment when the object is present. And thus, according to perdurance, objects are not *wholly* present at each moment they exist. Only a part of them exists at each moment they exist.

²⁷ Cf. Merricks 1994, p. 181

I am a friend of endurantism. I do not believe that objects have temporal parts.

And I believe that if objects are to persist at all, they do so by enduring. To argue this point conclusively would require a thesis of its own, so I shall not attempt that here. But what I do want to do is explain why I reject perdurantism. The primary reason has to do with what strikes me as an unsatisfactory consequence of perdurantism's account of change – namely that intrinsic properties are not instantiated in the way that we normally understand them as being instantiated.²⁸

According to a perdurantist, change occurs in the following way: a part of an object has some property F that another part of that object lacks. A natural way of reading this claim is as a rejection of (5), the proper subject condition. Recall that the proper subject condition holds that the object itself is the proper subject of change. Now compare these two types of claims.

- (a) The candle is straight at t and bent at t*.
- (b) The candle has a part that is straight at t and another part that is bent at t*.

According to (a), the candle itself is the bearer of the properties being bent and being straight. This is expressive of the spirit of the proper subject condition. The proper subject condition holds that the object itself bears the properties involved in change. And in this vein, (a) claims that the candle itself bears those properties. But now consider (b). A reasonable interpretation of (b) is that the candle is *itself* not straight or bent. Or at least it is not non-derivatively so. Rather, temporal parts of it bear the properties relevant to the change. A temporal part of the candle (namely, the t-part of it) has the property of being straight. Another temporal part of the candle (namely, the t*-part of it) has the property of

²⁸ Although there are other reasons to be dissatisfied with perdurance. See van Inwagen (1990a) and Zimmerman (1998).

being bent. The object itself never has as a non-derivative intrinsic property [being bent] or [being straight].

Of course, the perdurantist might claim that the object going through change is the proper subject of change. But he will concede that it only is so derivatively. The *whole* of an object does not bear the properties involved in change. Rather, temporal parts of it do. So for the perdurantist, the claim that a candle is straight at t and bent at t^* is really a claim about parts of that object. The candle inherits these intrinsic properties of its parts, and thus is intrinsically bent or straight in virtue of its parts being bent or straight. But note that this is not the claim expressed in the proper subject condition. According to that condition, the object itself is the subject of change. It is so non-derivatively.

You might think that the rejection of the proper subject condition is something to be taken lightly. I think it is not. For consider what this implies generally for the instantiation of an object's intrinsic properties. It seems that our natural understanding of property instantiation (at least for some properties, like shape or momentum or spatial position) is that the object itself – the whole object – comes to have or lack some intrinsic property. And it does so non-derivatively, i.e., not by having only a part that comes to have or lack that property. So the analogy between space and time that the perdurantist hopes to exploit in building her case actually breaks down.

Let me explain. An object can be red and green by having parts that are red and green. It is only *partially* red and *partially* green. It is not red and green 'all over'. But this isn't the case generally. Sometimes we think the whole object has the property in question. Think, for instance, of shape. Consider some piece of clay that we fashion into a circle. Take that piece of clay and fashion it into a square. What is it that is circular? The natural suggestion seems to be that it is the clay itself, not just part of it. And likewise, when we

fashion the circle into a square, it seems that the clay itself is now square. The same piece of clay, the numerically identical object, that was clay is now square. But obviously, this is not the way that a perdurantist will understand change. For the perdurantist, the piece of clay is a four-dimensional object; it has circular parts and square parts. (The shape of the clay itself on the four-dimensional picture will be more of a cylinder, spread in time and space.) The perdurantist might suggest that of course the four-dimensional object is circular and square; but it is neither circular nor square *simpliciter*. Rather it is circular derivatively; it is circular because it has a temporal part that is circular.

But once again, it seems that the natural understanding of properties like circularity is that they are the types of properties things can have non-derivatively. They are the types of properties that objects can have in themselves. The perdurantist, it seems, cannot accommodate for this idea – the idea that a single thing in its entirety possesses or lacks some temporary intrinsic property. It is the object itself, not merely a part of it, that bears the changing properties.

And likewise for properties like velocity, momentum and spatial position. When an object is positioned in space, the thing itself has that property, not merely a part of it. When an object is traveling at a certain velocity, we say that the object itself has that velocity, not merely a part of it. Unlike an object that is red and green that is so in virtue of having spatial or material parts that are red and green, an object that is bent, straight, or traveling at 12 meters per second is so non-derivatively, i.e., not in virtue of only some of its parts having these properties. *The object itself* has these properties. The object itself, and not merely parts of it, is the bearer of the properties. The object has these properties non-derivatively.

We might consider an example that will clarify this distinction I am trying to make between properties had by objects in virtue of themselves and in virtue of their parts. I

throw a baseball toward you. The baseball is composed of a certain number of atoms.

When I throw the ball, some of the atoms on the periphery of the ball move toward the back of the ball as it passes through the air. We measure how fast the ball is moving: 40 km/h. It seems clear that some of the atoms that compose the ball, in particular those that move toward the back, are not traveling at 40 km/h. It is possible, and even likely, that many of the atoms that compose the baseball are not traveling at the same rate as the baseball. Some atoms that are parts of the baseball might be moving at 37 km/h. Others might be moving at 36 km/h. But it seems obvious that we can sensibly say that the baseball *itself* is moving at 40 km/h. And it does so in virtue of itself, not in virtue of its parts. In fact, the baseball can be moving at 40 km/h even when many (or perhaps even most) of its parts are moving merely at 37 km/h. So it seems at least plausible that the intrinsic properties instantiated by certain objects, like momentum and velocity, will be instantiated in virtue of the object itself and not in virtue of its parts. And even if we were told that not all of the parts of the baseball were moving at 40 km/h, we would allow that the baseball was moving at 40 km/h.

(Perhaps this sort of suggestion is something at which the perdurantist will not blush. For she is attempting to provide an *analysis* of change, and in providing what she thinks is the right analysis, she might want to alter the understanding of the way in which properties are instantiated. But what is obvious is that the findings of perdurance do not accommodate our common-sense picture of the way that objects possess certain intrinsic properties like shape properties. For, as the picture above suggests, we tend to think that intrinsic properties are non-derivatively had by an object. They are importantly unlike properties that an object has in virtue of its spatial parts. What perdurantists need to do, then, is show how their theory can accommodate this idea. Or alternatively, perdurantists need to tell us why shape is something that is had by an object derivatively. For if

perdurance seeks to explain the phenomenon of change that common sense discusses, then it ought to reveal how common sense talk is compatible with the claims that perdurance makes. And there have been noble attempts at such reconciliation.²⁹ But I do not want conclusively to argue that perdurantism is wrong. I want merely to point out that it makes some claims that clash with one way we often think about the ways in which objects have intrinsic properties.)

My primary dissatisfaction with perdurantism, then, can be put as follows.

According to perdurance, change occurs through objects having different temporal parts with different properties. In this way, the object itself is not the proper subject of the properties involved in change. Its temporal parts are. Perdurance does, in my opinion, qualify as a type of change. If objects perdured, they would genuinely change. My problem is simply that perdurance theory does not properly account for the way in which objects have and lose certain intrinsic properties. Its rejection of the proper subject condition requires it to make some rather odd claims about the bearers of properties involved in intrinsic change. And in cases of change, I hold that a rejection of the proper subject condition forces perdurantism to get the bearers of intrinsic properties wrong. For instance, the shape of an object is something that is had by the object itself, not merely by a part of it. Therefore I am not making the objection criticized in the following passage.

The bad but tempting objection is that perdurance theory cannot account for change, because according to perdurance theory nothing really changes. According to perdurance theory, things 'change' by having a succession of different temporal parts with different properties. (Hawley 2001 p. 12)

The difference between my objection and this 'bad' objection is that I allow that perdurantist change genuinely is change. But I reject perdurantism's account of change on the grounds that it provides a false account of the way in which objects are meant to possess and lose

²⁹ See especially Sider (2001) and Hawley (2001).

intrinsic properties – specifically properties like shape. Perdurantism’s rejection of the proper subject condition entails that objects have their shapes in virtue of a part having that shape; but as I have tried to show, it seems plausible to suggest that such properties just aren’t had in that way. The object *itself*, not merely a part of it, is circular. And insofar as perdurantism entails that an object is circular in virtue of only a part of it being circular, I take it that it has a rather counterintuitive result. Rejecting (5), the proper subject condition, is certainly an option, but a costly one.

Varieties of endurance

In the last section I drew the distinction between the two primary theories of persistence: endurance and perdurance. I also tried to draw out perdurance’s implicit rejection of assumption (5) – the proper subject condition – and how such a rejection has some rather unfortunate results. Again, it is not the aim of this discussion that perdurance is to be rejected altogether. Rather, it is to show that it, like mereological essentialism, is implausible. There is a demonstrable contradiction in an ordinary conception of persistence. To avoid contradiction, we must reject one of the assumptions that generate it. Whether or not the results of rejecting the assumption are too implausible to accept is, in a way, a matter of taste. I don’t like the taste of the rejection of the proper subject condition, and I have tried to show why. In this section, I will turn to the other majority option among theories of persistence, endurance.

There are three primary formulations of endurance theory: relationalism, adverbialism and presentism. One of these three formulations rejects the common assumption: (2) the incompatibility condition. A second arguably rejects assumption (3): the law of non-contradiction. The second and third endurantist options focus closely on the times at which properties are had. In looking at the first two formulations, it will be

important to consider whether the properties involved in the account of change are the properties that we count as relevant to change, and also whether the accounts themselves imply unacceptable results for a general understanding of properties, property instantiation and intrinsicity. I shall argue that the first two options face implausibility. The third, I shall hold, is the most attractive endurantist option. But, I shall claim it cannot handle the special problem of change of parts.

Endurantist solution 1: Relationalism

Our first endurantist solution asks us to focus more closely on the times at which a property is had. My candle doesn't have incompatible properties since the properties it has are actually *relations to times* or time-indexed properties.³⁰ What is more, this account is meant to apply generally to all temporary intrinsic properties. So my candle doesn't have the property of being straight or being bent *simpliciter*, rather, it stands in the being-straight-at relation to time t_1 , and the being-bent-at relation to time t_2 . No contradiction there, just as there is no contradiction in my standing in the being heavier than relation to my mother and the being lighter than relation to my father. Objects can bear different relations to different things. And obviously, there is nothing contradictory in my standing in two different relations to two different objects. Likewise, so this suggestion goes, objects can bear different relations to times. My candle stands in the being-straight-at relation to one time, and the being-bent-at relation to another time. No harm, no foul. There is nothing contradictory in something standing in two different relations to two different times. As van Inwagen says:

When we say that Descartes was hungry at t_1 , we are saying either (take your pick) that this object bore the relation *having* to the time-indexed property *hunger-at- t_1* , or else it bore the time-indexed relation *having-at- t_1* to hunger. (van Inwagen 1990a, p. 113)

³⁰ See van Inwagen (1990a) and Mellor (1981) for defenses of this strategy.

This solution elegantly solves the problem presented by the conjunction of our five assumptions. It simply rejects the incompatibility assumption. Objects can persist through change without generating contradiction since the properties had are actually relations to times. There is no property such as being green *simpliciter*; rather, all properties had will be had at times.³¹ So what we thought was the property being-green-*simpliciter* is actually being-green-at-t.

While this account provides a solution to the problem of persistence, one might wonder whether it creates more problems in its attempt to solve it. For is it really the case that all properties had by material objects are relations to times? Are there any genuinely intrinsic, non-relational properties? What about properties like shape? Consider the clay that we molded into a circle, and then into a square. Is the circularity of that clay not intrinsic to that clay? That is, is it intrinsic or relational? David Lewis introduces this objection in the following passage.

First solution: contrary to what you might think, shapes are not genuine intrinsic properties. They are disguised relations, which an enduring thing bears to many times. One and the same enduring thing may bear the bent-shape relation to some times, and the straight-shape relation to others. In itself, considered apart from its relations to other things, it has no shape at all. And likewise for all other seeming temporary intrinsics... The solution to the problem of temporary intrinsics is that there aren't any temporary intrinsics. This is simply incredible, if we are speaking of the persistence of ordinary things. If we know what shape is, we know that it is a property, not a relation. (Lewis 1986 p. 204)

The idea that Lewis is getting at is this: properties like shape seem to be intrinsic properties. That is, if anything seems to be intrinsic (i.e. *non*-relational) it seems to be the shape of an object. The circularity of a basketball is not the type of property that is dyadic. It is simply a monadic property that the basketball instantiates. And what the defender of the time-

³¹ In a trivial way; of course all properties are had at times, but here the important thing is that the time actually enters into the property, turning it from a one-place to a two-place relation.

indexing solution is committed to is a denial of this intuition. They are committed to all of the properties an object has, or at least all of those that would present a problem for persistence, to be in actuality relations.

Do we really want this to be our solution? It is a solution that, as Merricks says, “does violence to our intuitions about apparently intrinsic features of an object, such as its shape” (Merricks 1994, p. 168). It seems we want our account of intrinsic change not to be something that makes what we originally think to be intrinsic properties actually relations. At the very least, we want our solution to be something that will *allow* the exemplification of properties that do not depend on indexing them to times. It is not at first blush an attractive option in our pursuit of a solution to the tension among our initial assumptions about persistence.³²

To avoid misunderstanding, let me clarify once more the exact nature of the difficulty involved in the relationalist solution. The relationalist holds that the properties involved in intrinsic change, the properties that are relevant to the problem of persistence, are actually relations. Objects bear straight-at relations to certain times and bent-at relations to other times. I find no fault with the *general* idea that objects bear relations to times, and that objects have relational properties. I understand that objects can and do have relational properties. So what is the problem? It is with the seeming absence of genuinely monadic intrinsic properties from the picture altogether. David Lewis has formulated this particular dissatisfaction below.

Some intrinsic properties really are monadic: for instance the property of living three score years and ten. Even the properties *being* and *straight* could at least sometimes be monadic: for instance when they are properties of momentary things. There is no reason in that case to take them as relations to times. (Lewis 2002, p. 4)

³² Interestingly, Hawley has recently recanted her initial (1998) acceptance of Lewis’s objection. In (2001) she sides with those who find Lewis’s objection unconvincing, like Haslanger (1989). While it is controversial whether Lewis’s objection is conclusive, it is certainly compelling. So much so that I find it on target.

The problem with relationalism, then, isn't merely that properties are seen as relations to times. Rather, it is that intrinsic properties seem to be eliminated from the picture altogether. And we have reason to believe that there are at least some intrinsic properties.

But the relationalist need not accept the claim that intrinsic properties are eliminated altogether from his picture. The relationalist can actually allow that there are some monadic intrinsic properties along the lines that Lewis presses. The relationalist can happily allow that properties of momentary things or the property of living three score years and ten really are monadic. What the relationalist might add, however, is that the properties that are relevant to *change* will always be relational. That is what is so particular about the properties Lewis lists in the quote above. These properties are not relevant to change, and so they are not in the realm of properties that the relationalist wanted to account for. The relationalist was trying to provide an account of change. And in so doing, he wanted to allow that all properties relevant to change (i.e. temporary intrinsic properties of objects) would end up being relations to times. So the relationalist can allow that the properties had by momentary objects are not relations to times.

Nevertheless I think that this line of response on the part of the relationalist can be met head on. For while the relationalist might allow for there to be some intrinsic properties, his account now looks to explain change in virtue of objects standing in different relations to times. But why should we think that genuine change occurs just in virtue of objects standing in different relations? It seems that some varieties of change are paradigmatically relational. I might instantiate the property "being the tallest man in the room" in one room but not in another. But why think that my going from sitting to standing is just a matter of my standing in different relations to times?

This response is in effect a demand for some sort of explanation on the part of the relationalist for why *all* change should be explained by appeal to objects standing in different relations to times. Certainly, some change seems overtly relational, like for instance my going from being the tallest man in the room to not being the tallest man in the room. But that I go from sitting to standing does not seem best explained by appeal to my instantiating different relations. My change in this case seems most reasonably about me, not in my relations to times. I change, and I don't change merely by instantiating different relations.

And, so, the first way of rejecting the incompatibility assumption, the relationalism that eschews intrinsic properties in general, faces a rather large difficulty; namely, explaining why we should throw intrinsic properties out of the picture altogether. So if you want to solve the problem of persistence, and follow the relationalist method of rejecting the incompatibility condition, you end up saying something rather implausible about intrinsic properties. But as I've pointed out, relationalism is not committed to eschewing genuine monadic intrinsic properties altogether. A relationalist can consistently hold that all properties relevant to change are relations to times while allowing that there might be some properties that are monadic that are not relevant to change. However, then the onus is on the relationalist to explain why or even how all change is a matter of standing in different relations.

Endurantist solution 2: Adverbialism

So what are we to do if we do not want our theory to leave monadic intrinsic properties (at least those relevant to change) behind? There is another option for a general account of persistence that looks to preserve intrinsic properties.

A second endurantist strategy says that the way an object has a property is temporally modified, not the property itself. So there are still intrinsic properties, but their

instantiations are modified by times. This strategy is known as *adverbialism* – just as something might be bound tightly, it can be straight in a t-ly way (where t is a time). It is related to relationalism, in that it appeals to times in which properties are held. It differs importantly from relationalism in that it holds that the properties involved are intrinsic, while their instantiations are relational. One way of putting the adverbialist position is as follows.

It is not the intrinsic property *bent* or *straight*, but rather the copula that relates this property to thing that has it, that turn into a relation to times. *Having* was originally thought to be a dyadic relation of things to properties; now it will instead be a triadic relation of things to properties and times. If you have at *t1* the property *bent*, the property *bent* is unscathed; it is still the same old monadic intrinsic property we always thought it was. (Lewis 2002, p. 4-5)

How does this solve the problem facing the endurantist? Take our now-familiar candle. We normally understand change as occurring in the following way: the candle has a property, namely being straight, and then instantiates a complementary (incompatible) property, being bent. The adverbialist holds that the candle is not straight *simpliciter*, rather it is straight-in-a-tly way. And it is not bent *simpliciter*, but bent-in-a-t*ly way. There is no contradiction there. The only contradiction would arise if straight and bent were instantiated in the *same* way. If the candle were *both* straight and bent in a tly way or a t*ly way, then we would have the contradiction that emerges from the incompatibility condition. Since change occurs by objects having complementary properties in *different ways*, then no contradiction arises. Haslanger provides a similar diagnosis.

One straightforward way to understand the qualification is to treat the predicates 'is straight in the morning' and 'is bent in the afternoon' as expressing two-place relations: to say that the candle is straight at 8am is to say that the *being straight at* relation holds between the candle and 8am. Correspondingly, to say that the candle is bent at 5pm is to say that the *being bent at* relation holds between the candle and 5pm. (*Mutatis mutandis* for *n*-place relations: add a place for time.) Paradox is avoided because there is no inconsistency in standing in the *bent at* relation to one time and the *straight at* relation to another. (Haslanger 2003, p. 328)

There are two possible objections that I shall raise against this view. The first objection I discuss has to do with a recent objection Lewis has raised against adverbialism. The second has to do with what seems its rejection of assumption (3): that objects cannot have contradictory properties. I shall argue that it either rejects this assumption or cannot provide a good account of change.

The first worry with adverbialism has to do with *having simpliciter* of properties. On the adverbial solution, all having of properties is *relational* having. Let me explain. It seems that it is a natural understanding of adverbialism that the having of properties is always relativized to a particular way of having properties. Thus, things are never simply bent or straight, but they are bent or straight in a certain way. And the ways of being bent and straight are temporal ways. The candle is straight in a t-ly way and bent in a t*-ly way. But is the candle ever bent or straight *simpliciter*? Is it a problem if it is not?

Why would we think that there ever is such a thing as being straight *simpliciter*? One reason is the generally plausible idea that if you ever do anything in a certain way, it follows that you simply do it. Let me explain. There are many different ways that I can smile at a person. If I am pleased with someone's performance, and want to convey this feeling to him, then I might smile at him *approvingly*. If I am enamored of someone, I might smile at her *lovingly*. If I want to make dinner guests feel at ease, I might smile at them *warmly*. But what seems certain is that all these various ways of smiling have something in common. They are all ways of smiling. Now compare this idea with the claims of adverbialism. Adverbialism holds that for the properties involved in change, the properties are had in a certain way. Things are straight and bent in a particular way, where the particular way is usually understood as temporally modified. So things have properties in various ways: namely t-ly ways, where t indicates a time.

The adverbialist seems to deny, however, that for whatever property you instantiate in a certain way, it follows that you have that property *simpliciter*. As Lewis says, “[a]ll you have *simpliciter* is a relational property: *bearing-having-at-t-to-bent-and-t1*.” (Lewis 2002, p. 5). There are, then, two things for an adverbialist to say in response to this charge. First, she can hold that all having of properties, even the having of properties *simpliciter*, is in some sense relational. Second, she can simply deny that you only have *simpliciter* the relational property. She can maintain that you genuinely have the property bent or straight *simpliciter*.

Before we look at the merits of these options, I should at least say why I think that the having of properties *simpliciter* is a benefit of some general account of property instantiation. Recall our earlier example of the many ways in which I can smile. I can smile approvingly, lovingly, warmly and many various other ways. But what is it that is common to all of these ways of smiling? It is, namely, that they are all ways of smiling. So, it can plausibly be said, whenever I smile in a certain way, I instantiate the property of smiling *simpliciter*.

But, perhaps more importantly, it is at least *prima facie* plausible to suggest that what grounds the similarity relations among all these ways of smiling is the instantiation of the smiling *simpliciter* relation. For instance, what is similar between my loving smile and my approving smile is grounded in the fact that they are both instances of my simply smiling, or smiling *simpliciter*. Surely, there is something common to all cases of smiling. But what, other the fact that they are all instances of plain old smiling could ground the similarity relations among them? I can’t think of a good answer. Not to say that there isn’t an answer out there that does not appeal to smiling *simpliciter*. But if there is one, I certainly am not aware of it. Thus it is, I maintain, at least initially plausible to grant that smiling *simpliciter* is instantiated whenever you smile in a certain way. That’s what makes the property involved

in an adverbial case of smiling a *structural* property: the presence of some property *simpliciter* (namely, smiling) accompanied by some particular adverbial description of that property. The adverbial description of that property, we might say, links the way with the smile. And the simple claim that there is no smiling that isn't smiling in a particular way takes nothing away from the claim that any case of smiling is still a case of smiling *simpliciter*. Any rejection of that claim demands some form of explanation as to what exactly grounds the similarity among all the various instances of smiling. Smiling *simpliciter* is a good answer, perhaps the best; and until I see an answer that can beat it, I am inclined to think it is the right answer.

But let's say that the adverbialist can answer this challenge. Let's say that he provides an analysis of property instantiations that allows for the grounding of similarity relations among all the various property instantiations there might be. And further, let's assume that he holds that all having of properties is, in some sense, relational. That is, let's say he simply denies that there is such a thing as having a property *simpliciter* (or perhaps, *even* the having of properties *simpliciter* is relational.) Is there anything wrong with that? Lewis (2002) thinks there is. In fact, he thinks it leads to Bradley's regress. What is Bradley's regress? For our purposes, it is a problem that emerges from trying to explain having a property *simpliciter* in terms of relational having. The basic idea is this: if you try to explain having *simpliciter* in terms of relational having, your explanation will never finish. Your explanation will go on *ad infinitum*.

Let me explain. This type of adverbialist move charted above seeks to explain what it is for something to have a property *simpliciter* in terms of relational having. Lewis (2002, p. 6) picks out Bradley's regress in this move as follows. Take some simple property *P* had *simpliciter* by some object *X*. Our adverbialist will explain the having *simpliciter* in terms of some relational having. She will say something like: *X* has *P* by having *bearing-having-to-P*.

But what is it that explains X's having *bearing-having-to-P*? That is, presumably, a having *simpliciter*, and so demands a relational account. So the adverbialist will explain that having in relational terms: X has P by having *bearing-having-to-P* by having *bearing-having-to-(bearing-having-to-P)*. But that too demands a relational account. What relational tie binds *that* having? Again, presumably: X has P by having *bearing-having-to-P* by having *bearing-having-to (bearing-having-to-(bearing-having-to-P))*. And so on *ad infinitum*.

The essence of the problem can be put as follows.

[I]f a separate copula is needed to bind an object to a property, then what binds an object to the copula itself (isn't the separate copula just a relation like others)? Do we need another copula to do that work? If so, then we will need an infinite number of copulas, each to bind the next; if not, then we don't need the copula to begin with and should treat the property as binding itself to the object. (Haslanger 2003, p. 341)

What can the adverbialist say in the face of Bradley's regress? Either they stick to their guns and end up with an infinity of explanations for having *simpliciter*, or they claim that all of the relations aren't meant to be explanations of havings, but rather are equivalences of that having. The first option is not attractive. An infinity of explanations is as good as no explanation at all. So the first option leads to no real explanation of how all having is relational. The second option seems attractive at first blush. You simply deny that all the copulas are explanations of having. You insist instead that they are equivalences, and thus avoid a problematic regress. But then, as Lewis points out:

In that case we can stop the regress anywhere we like, and claim that our most recently mentioned having is not a relational having but rather a having *simpliciter*. But then we have given up on explaining having *simpliciter* in terms of relational having; so we have given up on showing that all having is relational. (Lewis 2002, pp. 6-7)

So the first adverbialist move, the one that holds that all having of properties is relational – even having *simpliciter* – falls short. It either provides no explanation of having, or it implicitly admits an unexplained having *simpliciter*. But what about the adverbialist who

denies that all having need be relational or adverbially modified? What about the adverbialist who agrees with the intuitions drawn on earlier that it follows from you having a property in a particular way that you have it *simpliciter*?

That way looms contradiction. Recall that the adverbialist wants to explain change in the following way. The candle is straight in a t -ly way. It is bent in a t^* -ly way.

Contradiction only arises if the candle is straight and bent in the same way. But if the adverbialist follows the genuine intuition that if a candle is straight in a certain way, then it is straight, and that if it is bent in a certain way, then it is bent, we have the following result. The candle is straight in one way (namely, being straight *simpliciter*) and it is *bent* the exact same way (namely, being bent *simpliciter*). The candle, then, is both straight and bent. But recall assumption (3): objects cannot have incompatible properties. But if the adverbialist admits that t -ly straight and t^* -ly bent candles are straight and bent *simpliciter*, then he has allowed them to have incompatible properties, since he takes it that what it is for two properties to be incompatible is for them to be instantiated in the same way. If it follows from being x in a t -ly way that something is x *simpliciter* (or, x in an unmodified way), then any two properties that are instantiated in a relevantly different way will also be instantiated in a relevantly similar way (namely, an unmodified or *simpliciter* way).

And so, the adverbialist has walked straight into contradiction. He allows it to be the case that something can be both straight and bent. That was the primary contradiction we wanted to avoid in the first place. And I think that this problem is best explained in the following passage.

If the adverbialist could analyze 'being t -ly F ' in terms of 'being F simpliciter and the time at which F is exemplified, then an object could at one time be F simpliciter (since this would be an "ingredient" of its being t -ly F '), and at another time be *not- F* simpliciter (since this would be an ingredient of its being- t^* ly not F). But if an object can at one time be F simpliciter, and at another be not F simpliciter, then we have the seeming contradiction the adverbialist was hoping to do away with (and if there

is no contradiction in being *F* at one time, and not *F* at another, then there is no need to embrace adverbialism in the first place). (Merricks 1994, p. 169-70)

Perhaps the adverbialist could maintain that the only ways that are relevant to contradiction are *temporal* ways.³³ In this way, he could maintain that something's being *F simpliciter* and not *F simpliciter* are not contradictory since that object is not both *F* and not *F* in the same *temporal way*. And I think that this solution makes sense. But, as Merricks points out above, it was seemingly the idea that something could not be both *F* and not *F simpliciter* that generated the need to go to adverbialism in the first place. Adverbialism is an attempt to answer the charge that an account of persistence leads to contradiction since it implies that something could be *F* and not *F simpliciter*. If the adverbialist concedes that there is no contradiction in something's being *F and not F simpliciter* in the first place, then the entire motivation behind his adverbialist program seems lost. As Merricks points out well, there is no need for adverbialism if being *F* and not *F* in *simpliciter* is not contradictory.

So adverbialism is faced with at least two dilemmas. First, if an adverbialist maintains that all having, even having *simpliciter*, is relational, then he ends up either putting forward infinite explanations for having *simpliciter* or appealing implicitly to having *simpliciter* and thus jettisoning his very aim of explaining all having in terms of relational having. Second, if an adverbialist allows for having of properties *simpliciter*, then she either generates the contradiction she formulated adverbialism to do away with (and thus violates assumption (3), the law of non-contradiction), or she commits herself to the claim that having both *F and not F simpliciter* is not contradictory and makes adverbialism irrelevant. I think this is enough to show how problem-riddled adverbialism is.

³³ Haslanger raises this possibility in her (2003, p. 32)

Endurantist solution 3: Presentism

The first two endurantist solutions failed primarily in their account of what it is for something to have a property at a time: the time-indexing solution made all properties relations, while the adverbialist solution could not account for the having *simpliciter* of properties. Our third solution avoids both of these problems. It allows for genuine intrinsic properties, and it also allows objects to have properties *simpliciter*. What this theory denies, however, is that the fact that an object *had* a property implies that the object *has* that property. An object that *was* straight doesn't have the property "being straight". And we thereby avoid the contradiction of an objection suggested by an object's being straight and becoming bent: an object only has the properties it has at the present time.

Presentism takes it that the present has a special ontological status. Put more precisely, it takes it that the *only* things that exist are things that exist at the present. So the only objects that exist are those that exist now. There are not dinosaurs. There are supercomputers. There are not flying cars. And just as the only objects that exist are those that exist at the present time, the only properties that an object instantiates are those that it instantiates at the present time. For instance, I am now sitting down. I now have the property of sitting down. Five minutes ago, I was standing up. I had the property of "standing up" when the time five minutes ago was present, but I no longer have that property.

A good analogy to draw is between the presentist's claims about the term "now" and a modal actualist's claims about the term "actual". According to the modal actualist, there are modal truths – for instance, there could have been talking donkeys. But it simply is not the case that talking donkeys exist. This is to be understood as opposed to a modal realist's claims about modal truths. If it is possible that there are talking donkeys, on a Lewisian

modal realist account, then there actually *are* talking donkeys in some possible world.

Possibilia are concrete existing objects; they are just not actual. For the Lewisian modal realist, the word “actual” functions like an indexical.³⁴ Just like China exists, but not **here** where I am, possibilia exist but are not **actual**. (Actuality, being an indexical, will be relative to the world that contains the speaker. For someone in China, China is **here**. Likewise, for an entity in some possible world, that world is actual.) The modal actualist, on the other hand, claims that possibilia are not concrete existents. The only (concrete) things that exist are things that are actual. There are donkeys, but there are no talking donkeys. Anywhere. Likewise, the presentist claims that the only things that exist are the things that are present. Someone who rejects presentism will claim that the present is much like the modal actualist’s indexical; the past exists, but it is not **now**. The future exists, but it is not **now**.

And so we arrive at the presentist’s account of change. For the presentist, change fits our intuitive picture: objects change when they come to have or lack complementary properties. So the candle comes to have or lack properties like being straight or bent, and these properties are understood as not indexed to a time. So when the candle is straight, it is straight *simpliciter* and when it is bent, it is bent *simpliciter*. Of course, it is a truism that objects have properties at times. The candle is straight at t and bent at t^* . But what it is for an object to have a property at a time is simply for it to have that property *simpliciter* when some time is present. So what it is for the candle to have the property of being straight at t is for it to have the property of being straight when the time t is present.

So, then, what does the presentist say about our initial case of the candle? The candle has the property of being straight at t and being bent at t^* . Are these complementary properties in violation of the law of non-contradiction? Here is Merricks on such properties.

³⁴ See Lewis (1973) and (1970).

My exemplifying 'being *F* at *t*' does not imply I exemplify 'being *F*,' for *t* may not be present. My being *F* at *t*, therefore, is compatible with my being not *F*. For example, when 1985 was present I had the property 'believes Reagan is president'. Therefore, I have the property 'believes Reagan is president at 1985'. But this does not imply that I, or any part of me, or anything else has the property 'believes Reagan is president'. I used to have the property; I no longer have it. (So on my analysis real change of properties is possible; properties can be gained and lost.) (Merricks 1994, p. 177)

And so it goes for our candle. The candle at *t* has the property of being straight. The candle at *t** has the property of being bent. And so at *t** it is not true that anything has the property of being straight. Surely, something has the property of being-straight-at-*t*. And that something is the candle. And nothing has the property of being bent when time *t* is present. Surely, something has the property of being-bent-at-*t**. And that something is the candle. Another way of putting this is as follows: At *t*, the candle is straight simpliciter, but not bent simpliciter. At *t**, the candle is bent simpliciter, but not straight simpliciter. Nothing's contradictory in the rather homely fact that something can be straight at one time and not at another. It would be contradictory if the candle were straight and bent at one time. But it isn't. Problem solved. The candle is straight at *t* and bent at *t**. But it is not straight at *t** nor bent at *t*. There is no problem since contradiction would only arise if the candle were straight and not straight at the same time.

Presentism is a controversial doctrine for several reasons.³⁵ Some say it is incompatible with special relativity and Minkowskian space-time.³⁶ Others say it cannot account for the idea that truth supervenes on being; there are facts about the past but nothing in the past exists that could make those facts true. There are no "truthmakers" for

³⁵ In fact, you might think that if it is the only option for a theory of endurance, then we might as well give up on endurance. But as I have claimed, if objects persist, they endure. So if you don't like presentism, you shouldn't like endurance.

³⁶ Sider (2001) Ch. 2

past and future facts.³⁷ And for these reasons, people think that presentism is wrong. But the controversy does not derive from its rejection of the assumptions that were meant to generate the problem of persistence. Rather, they are from other ontological claims – claims that are contentious but not outright implausible. It is not like the claims that the relationalist makes about there being no intrinsic properties. And it is not like one of the claims that the adverbialist must make about having properties *simpliciter*. These, I have tried to show, are outright implausible. Presentism is contentious because of its picture of time. And so you might think that presentism has a *prima facie* plausibility as a general account of persistence. I think it does, and if pressed I would accept it as a *general* theory of persistence.

But let's lay this aside. For no matter how appealing and attractive presentism is as a general account of change of *properties*, I do not think it can account for every single type of change. In particular, I think it is a good account of how candles can be straight and bent. I think presentism correctly explains how objects can change properties. But I do not think it can handle the problem of change in parts. What I want to show in the remainder of this section is that while presentism can account for genuine change of properties, it cannot make sense of an object's persisting through a change of parts. It will be the aim of the next chapter to provide an argument that shows that a case of change of parts generates a special problem no matter what your theory of persistence.

But before I go to the next chapter, let me first explain in particular why presentism cannot accommodate change of parts. According to the presentist solution, the only things that exist are those that exist in the present. And so, if what it is for an object to be wholly present is for all of its parts to exist, the only parts that an object has are the parts that it has at the present. So let's look at the case where the candle loses a part. We can describe the

³⁷ *Ibid.*

situation as follows. At time t , the candle is composed of parts $A_1 \dots A_n$. It loses a part. At time t^* , the candle is composed of parts $A_1 \dots A_m$. How can the same thing be composed of one set of parts at one time, and another set of parts at another time?

Recall that we described endurance as the claim that an object persists through time if it is wholly present at each time that it exists. And what it is for an object to be *wholly present* at some time is for *all* of an object's parts to exist. At some time t , the candle is composed of $A_1 \dots A_n$. If it is to persist through time, then it seems the obvious desideratum would be for all of its parts to be present at some later time t^* . But let's say that at t^* the object loses a part, A_n . Further, let us suppose that A_n is annihilated. A_n no longer exists. At t^* , then, the object is composed of $A_1 \dots A_m$. It would seem, then, that the object that is *wholly present at t* is not the object that is *wholly present at t^** . The object at t^* lacks a part that the object at t had. How can the candle that was wholly present at t and composed of $A_1 \dots A_n$ be the same candle that exists and is wholly present at t^* and be composed of $A_1 \dots A_m$? If an object's being wholly present just amounts to all of its parts existing, then shouldn't it be the case that something that is wholly present at both t and t^* must have the same parts? I simply cannot understand how something that is wholly present and composed of a certain number of parts could be the same thing that is wholly present and composed of a different number of parts. (You might, for that reason, actually feel that presentism rejects claim (4) above. I don't want to accuse it of that outright, but I do want an explanation for how it doesn't violate (4).)

It would seem that if all of the parts of an object at a time exist at t and also at t^* , then that object is wholly present from t to t^* . If having parts $A_1 \dots A_n$ are what makes an object wholly present at t , then it seems bizarre to suggest that the same object can be wholly present an instant later when A_n does not exist. Moreover, that two objects that are wholly

present at different times share all of their parts seems to underscore the idea that *that* object undergoes change of properties. The *same* candle can be straight at t and bent at t^* in part because it is *wholly present* at both t and t^* . So it strikes me that presentism has a difficult time explaining what it is for an object to be wholly present. If being wholly present amounts to all of an object's parts existing, and all of its parts at t are not present (and thus do not exist) at t^* , then how could whatever is wholly present at t^* be what is wholly present at t ? They, after all, have different parts. What we need is an explanation of why two things that are wholly present at two different times, and composed of different parts are actually identical.

These concerns don't constitute a devastating objection to presentism. The presentist may well have an account. But these concerns do constitute an expression of confusion at what the presentist actually has to say about persistence. (And as I said, you may feel they constitute a charge that presentism implicitly rejects (4)). Nevertheless, I think there are cases that threaten to challenge the generality of the presentist's claim. If there are things that are parts of some object and yet do not exist, then it seems that that object would not be wholly present. I think there are some intuitively plausible cases of objects with parts that do not exist. And if these cases go through, then the presentist's claim is wrong; it is the case that an object could have parts that don't exist. I will list these cases below. (The stories I am about to tell do *not* require appeal to non-existent objects, although they are certainly consistent with there being non-existent objects. I don't believe in non-existent objects. Therefore, the parts at issue here will be literally *nothing*. But not only do these cases constitute what I take to be genuine examples of objects having parts that do not exist. These cases also demand an explanation from the presentist of certain cross-temporal relations like "Yesterday occurred before today" or "I am the grandson of James Abernathy" (James Abernathy no longer exists). These relations obviously seem to hold across times.

And yet it seems the presentist needs to say more about what the relata are of the relation expressed by these cross-temporal claims.)

This Week

I'll start with a weak example, one that could plausibly be denied since it does not obviously qualify as an object. According to the presentist, the only things that exist are the present. Say that Thursday is present. According to the presentist, last Sunday, Monday, Tuesday, and Wednesday as well as this Friday and Saturday do not exist. But it seems plausible to suggest that this week exists. This week is certainly present. This week exists. And it seems equally plausible to suggest that this week is composed of the days of this week: including Monday, Tuesday and all the other days of the week that are not present. But this would imply that something that is present (this week) has parts that do not exist (the non-present days of the week). So it seems that something exists that has parts that do not exist. Thus, something that exists is not wholly present at each time it exists.

The Jigsaw Puzzle

Yesterday I went out and bought a jigsaw puzzle. I labored over it day and night, and finally completed it. During the night, my mischievous nephew stole a piece of the puzzle. When I went to admire my completed puzzle the next day, I noticed the missing piece. I was apoplectic. My nephew noticed me sulking, and to add insult to injury, pulled the puzzle piece out of his pocket and held it in front of me. I tried to retrieve the puzzle piece so that I could once again gloat over my completed puzzle. My nephew, being even more mischievous, threw the puzzle piece into the roaring fireplace. I lamented the loss of the puzzle piece and sulked more. My puzzle was incomplete. It seems plausible to say that the puzzle has a part – namely the incinerated piece – that no longer exists. The puzzle is forever incomplete in fact, insofar as it has a part that no longer exists. And that is why I

was so infuriated with my nephew – he made it such that my puzzle would never be complete. What ruins the puzzle for me is that it has a part that is irretrievable – it has a part that I cannot get back since the part no longer exists.

The Ship of Theseus

To press the point slightly differently, consider what the presentist would say about the Ship of Theseus example. He would say that for each moment that the Ship of Theseus exists, all of its parts exist. So if the Ship of Theseus is to persist through the loss of a plank, all of its parts must exist after the loss. But consider the huckster who takes the plank and puts it on his wall. He claims it is a part of the Ship of Theseus. And so it seems, it is. We certainly might value it. (Think of people taking pieces of stone back from the Germany, proudly claiming that they have a part of the Berlin Wall.) But then the Ship of Theseus persists through change, and has a part that is not presently affixed to it. Now consider if we annihilate that plank. It seems plausible to suggest that there is a part of the Ship of Theseus that does not exist. Or so, at least, it seems. If that object can survive being removed and still be a part (even though it's been replaced by aluminum and is no longer a functional part of the ship) perhaps it could be a part of the ship after it exists. And if it can, the presentist needs to explain to me why the Ship of Theseus should survive the loss and annihilation of that part, and still be wholly present. Simply to say that objects can have different parts at different times does not suitably solve the apparent tension.

I take it these examples provide some plausibility for the idea that objects can have parts that do not exist. (I do not believe they constitute a proof that they can.) My puzzle exists, but it is not wholly present since it has parts that do not exist. Whereas presentism does a good job of accounting for change of certain properties, it does not provide a good solution to the problem of change of parts. And this problem is only aggravated by the fact

that endurance, a theory of which presentism is a species, is partially defined by the idea that *all* of an object's parts exist at each time it exists. So, I conclude, while presentism can make sense of persistence through change of properties, it faces at least some initial problems with explaining how an object can persist through change of parts. And these problems shall be exacerbated in the next chapter.

Conclusion

In this chapter I have argued that none of the options currently available to an account of persistence completely escape the charge of implausibility. The accounts at hand either violate one of our common sense assumptions with strange consequences, or they bring to bear a general metaphysics that is problematic. The one that comes closest to satisfying me – presentism – faces a problem when it comes to change in parts. But what I want to bring out, the most important lesson of my chapter, is not that the implausibility ought necessarily to force us to reject the accounts offered. What is the lesson of this chapter? It is that mereological essentialism, the doctrine I accept, cannot be eliminated simply on grounds of implausibility. For instance, you might reject perdurantism because of its account of objects. You might reject it, as I do, because it has an incorrect ontology. Or you might reject presentism for the very reason I accept it: it denies that there are any times other than the present or any properties had other than those had in the present. But to make the charge of implausibility, I claim, should carry very little weight. All answers to the problem are implausible in some way or another. That's what makes the problem of persistence a genuine problem.

“That is all fine and good,” you might say, “but you haven't given me any reason to think mereological essentialism is true!” We have explored the motivations for the various views throughout this chapter, and admittedly, I have given little reason so far for thinking

mereological essentialism is true. All I have shown is that the most common objection against it – its implausibility – is no reason to reject it. It is the job of the next chapter to provide a reason for believing. I will provide an argument that is demonstrably in favor of mereological essentialism.

Chapter 4: The paradox of increase³⁸

As I mentioned at the close of the previous chapter, you might think that no matter what implausibility may affect the general solutions to the problem of persistence, any of these solutions is preferable to mereological essentialism. (Note, as I said in the last chapter, that mereological essentialism is not a general theory of persistence. Rather, it is a claim about a particular kind of change – change in parts. Thus it should not be seen as a rival to the other theories of persistence, but rather, a possible addition to general theories of persistence.) Mereological essentialism claims that an object cannot survive the loss (or gain) of a part, and in so claiming, has shattering consequences for our ordinary thinking about material objects. Mereological essentialism entails that when we add a bell to a bike, the bike that we had ceases to exist. It also entails that if that bike loses an atom, so too it ceases to exist. I am conscious of the incredible nature of mereological essentialism. It is a doctrine that should not be believed without good reason.

And I think there is a good reason to accept it. In this chapter I want to present a particular paradox concerned with growth and diminishing of material objects. This paradox, I believe, best supports mereological essentialism. And what is more, anyone hoping to solve the paradox via denying mereological essentialism will be faced with extraordinary consequences. And these consequences are as equally outrageous as mereological essentialism. In the face of the paradox I am about to present, mereological essentialism comes out looking much more plausible than it did before. It is a doctrine that ought not be ignored.

³⁸ I am greatly indebted to Eric Olson for the discovery of this paradox. The original schematic argument below is his. The revised schematic argument is mine. I would like to thank him for his kind permission to discuss his schematic argument.

The paradox introduced

The paradox that I invoke to come to mereological essentialism's rescue is an old paradox known as the paradox of increase. Take some material object – a bicycle. My bicycle is composed of many parts: a frame, two wheels, gears, a chain and pedals. But I don't quite like my bike as it is. It doesn't have the pizzazz that other bikes in my neighborhood have. Those bikes have parts that my bike does not have: bells and whistles. In a fit of jealousy, I rush off to my local bicycle shop and buy a bell for the bike. I attach it to the bike and happily ride it around the neighborhood, ringing the bell frequently and annoyingly. Our normal understanding of what has happened seems to be this: adding the bell to the bike makes it bigger. My bike has grown by gaining a part that it did not previously have.

Now let's imagine that my neighborhood rival notices the bike's new bell, and decides to take it for himself. He sneaks to my house late at night and surreptitiously removes the bell from my bike. He rides by the next day ringing the bell that was once on my bike. I examine my bike and discover the missing bell. I am dejected. A natural way of understanding what has happened in this case seems to be: removing the bell from my bike makes it smaller. My bike has lost a part that it once had.

So goes our normal understanding of growth and diminishing. But have we actually made my bike bigger by adding a part to it? Have we actually made my bike smaller by removing a part from it? Another way of understanding the case is as follows. The bicycle doesn't actually get any bigger when we add the bell to it. Instead, it gets a neighbor that it did not have before. And when we remove the bell, the bike doesn't get smaller: it just loses a neighbor that it once had. This is another way of talking, surely, but why should it be preferred to the normal way of understanding growth and diminishing? Roderick Chisholm

raises the paradox of increase that emerges from our intuitive way of thinking about growth and diminishing in the following passage.

We think we can make things bigger by adding parts to things. But what are the things that we then make bigger? Suppose we have a certain thing A and then attach to it a certain other thing B. We then have a bigger object than we had before. But what object became bigger? It was neither A nor B, for these things remained the same size they were before. And it was not AB for AB did not exist until A was joined with B. (Chisholm 1976, p. 158)

Let's consider this puzzle with the case of our bicycle. Assume that the bicycle that exists before the bell was added consists of only one part. (This latter assumption won't affect the argument's validity, since it would work if the bicycle were composed of many other parts. The assumption is merely for simplicity's sake.) Call the bicycle A. Call the bell B. Let's assume for reductio that the bicycle before the bell is identical to the bicycle after the bell. So A – the bicycle before the bell – is identical to the bicycle after the bell. The paradox is supposed to be this: A does not get bigger, since A remains the same size. B does not get bigger since B remains the same size. There is a bigger bike composed of A and B, but this can't be either A or B, since A and B are the same size as they were before. So A can't be the bicycle after the bell is added. A can't gain B as a part, since A is the same size it was before the bell was added.

This way of putting the argument assumes that A is the same size after the bell's addition as it was before. But that is simply to deny the common sense assumption that A grows. So let's put the argument another way. If we put it in this way, then we can capture what is really at issue in Chisholm's quote above. The following represents the state of affairs before the bell was attached to the bike.

A B

The two objects above are discrete. They together do not yet compose anything. Now we add the bell to the bike. We compose a bigger bike – a bike with a bell on it. That state of affairs can be represented in the following way.

?B composes A

The question mark above is because we don't want to call the part that is A minus the bell A. For A has a part that the object represented by the question mark does not have: B. Our common sense understanding of the situation, recall, is that A *grew*. It is bigger than it was. So, let's call the object in the region occupied by the bike minus its bell C. The state of affairs that we will have after we add the bike to the bell will be represented as follows.

CB composes A

It should be obvious that, according to common sense, the bike gained a part: B. The bike has a part that it once did not have. This means that before we added the bell to the bike, the bike did not have the bell as a part. Now the bike has two parts – the bell and the part to which we added the bell. We added the bell to *something*. A gained B as a part. But what, other than the bell, composes A? It seems that it is composed of B and something else roughly the shape of A before the bell was added. Call this part C.

We have assumed that A is composed of two parts: B and C. B existed before we added it to A, and it exists after we added it to A. B is not destroyed just because it is taken up by a larger object as a part. So it is clear that B exists before and after we add B to A. And it is obvious that C exists after we add the bell to A. A is composed of B and C, so it should be clear that C exists after we add the bell to A. But did C exist before we added the bell to the A? It is plausible to suggest that it did. For how could we have *brought* C into existence by doing something to A? When I add a bell to my bike, I believe that I've made it bigger. But I don't believe that I've brought a new object into existence. Likewise, when I

remove the bell from my bike, I don't believe that I've destroyed anything. I simply make my bike smaller. Since we don't create or destroy C by doing something to A (and since C doesn't come into existence *ex nihilo*), we should assume that C exists before we add B to A. To deny that C exists before B was added to A is to hold that we bring material objects like C into existence merely by changing their environment. (As we shall see later, this is certainly a position one can take. But I shall further argue against this type of claim below.)

We think that C exists before we add B to A. But where is C before we add B to A? It is the part to which we added the bell to make A bigger, so it looks like it is exactly where A was before we added B to A. That is, C is where A was before the bell was added, and it is where A partially is after the bell is added. So this means that C and A are (before the bell's addition) in the exact same space at the same time, composed of the same stuff in the same arrangement. But recall what we concluded in Chapter 2. Two material objects in the same space at the same time, or rather, composed of the same stuff in the same arrangement are identical. Since before we add the bell to A, it shares all parts in the same arrangement with C, we must conclude that A and C are identical.

A and C are identical. But here's the problem. C does not gain B as a part. A is composed of two discrete objects: B and C. And B was never a part of C. But if A and C are identical, and if C never had B as a part, then it seems A never gained B as a part. Thus, you cannot make A bigger by adding a part to it. And this means that the bicycle (i.e. A) cannot grow by adding a part to it. And thus all of an object's parts are essential to it; an object cannot gain or lose parts. Thus, unless we can find our way out of the paradox, it seems that mereological essentialism – the view that an object's parts are essential to it – is true. This concludes the paradox of increase. A similar argument (we might call it “the

paradox of decrease”) implies that nothing can get smaller by losing parts. Here is the argument against increase by part addition in a strict form.³⁸

- (1) Suppose B is a part of A after it is attached, but not before. (Assumption)
- (2) If any x is part of any y, then y is composed of x and a third thing, z. (Premise)
- (3) So A is composed of B and C after B is attached. (1,2)
- (4) C exists before B is attached to it. (Premise)
- (5) Then A and C are made of the same matter before B is attached. (1,4)
- (6) No two things can be made of the same matter at once. (Premise)
- (7) So A = C. (4,5,6)
- (8) So B is a part of C after it is attached (7,1, contradicts 3)

Anyone who wants mereological essentialism to be false will have to reject one of the premises above. But I want to point out two premises above that we shall not reject.

Premise (1) comes from a rejection of the view of composition known as *universalism* (or *unrestricted composition*).³⁹ This is an increasingly popular metaphysical view, but it is one that I shall assume is false. Universalism entails that any two objects compose some further object.

Thus, not only is the bell a part of *my bike* before it is attached, but it is also a part of *my house, my cat and car*. (This is speaking loosely. Rather, there exists a fusion of my bike and the bell. There exists a fusion of my house and the bell, one of my cat and the bell and one of my car and the bell. We can restrict quantifiers so as only to refer to my bike as those parts that normal bell-less bikes have. But the point remains. According to universalism, there is an object composed of my cat and a bell, my house and a bell, etc.) I do not think that there are any material objects composed of a bicycle bell and my cat, and thus I take it that (1) is an acceptable assumption. At any rate, I do not aim to convince the universalist that he is wrong. I just want to show what happens when we, like common sense seems to recommend, accept that the bike does not have the bell as a part before it is attached. And so we need not worry about rejecting the assumption above.

³⁹ For defenses of universalism, see Lewis (1991), Sider (2001) and Hudson (2001). For rejections see Merricks (2001) and van Inwagen (1994).

³⁸ Olson *Unrestricted Composition*, p. 1.

And there is a second premise we shall not reject. Notice that premise (6) flows easily from my uniqueness of composition and arrangement that I make the case for in chapter 2. For according to that principle, any two objects with the same matter (i.e. the same parts at some level of decomposition) are identical. There can only be one object composed of a set of parts at a time. While this might be a controversial premise, it is one that I made the case for, and I think unless my objections can be satisfactorily met, it is a premise we ought to accept. Thus, premise (6) is not to be rejected. That leaves us with only two premises to be rejected: (2) and (4). In what follows I will show what is required of a theory that seeks to reject these premises. I believe that what is required to give up mereological essentialism is just as troubling as the doctrine itself.

Rejecting (2)

How can we reject premise (2)? It seems we need a case where x is a part of some object y , but there is no z such that it is also a part of y . As I will show in this section, there are some cases that prove the conditional in (2) to be false. However, I believe that we can alter the argument such that it still leads to contradiction by replacing (2) with a related conditional. But first we must look at the argument for the claim that (2) is false. And one way of providing that argument is to say deny the existence of C. How can we do that? Peter van Inwagen provides one such way.

Take a table. Let's say you believe there is a part of the table that is constituted by the table minus its left leg. (In other words, you believe that there is a material object made up of the parts of the table minus its left leg). At time t , you will believe that there is a material object that is the table occupying the region that the table occupies, and a material object that is the table minus its left leg occupying the region that the table occupies minus the region occupied by the table's left leg. Call the table "T" and the table-minus-its-left-leg

“T-minus”. Now, consider what happens when you remove the left leg of T after time t.

Presumably, you believe that the table still exists, for you are likely to believe that a table can survive the loss of a leg.⁴⁰ But now you have the following problem. Consider the following identity claims.

The thing that was T-minus before t = The thing that was T-minus after t

The thing that was T-minus after t = The things that was T after t

The thing that was T after t = The thing that was T before t

But, simply because T had parts that T-minus did not have, we must conclude that:

The thing that was T-minus before T does not = The thing that was T before t

What, then, is the problem? If you accept that there is a material object that is a part of the table - something like the table’s left half or the table’s left leg - then you will accept that there is a material object that is the table minus that part. And, *prima facie*, you will not accept that the table is identical to the table-minus-the-part before the part is removed. But, since you do accept that tables can survive the loss of parts, you accept that after the table-leg is removed, the table is still there. The problem is this: the table-minus-its-left-leg is still there, and so is the table. What’s worse, they occupy the same region, and they have all the same properties.⁴¹ What is their relation? Recall our discussion of composition in Chapter 2. You are committed to the co-location of two distinct material objects with all the same properties, relations and matter. And as I argued earlier, no two distinct objects are made of the same matter in the same relation at the same time.

“What’s the problem?,” you might ask, “I don’t believe in things like T-minus, I just believe in things like table-legs. These parts don’t seem arbitrary, do they? And legs aren’t wholly co-located with tables, so I don’t have the problem that someone who believes in T-

⁴⁰ You might say “No, the table does not survive the loss of a leg.” No matter. It seems that most people *will* accept that tables can survive the loss of an atom. Just rerun the argument replacing “left leg” with “a single atom”.

⁴¹ Ignoring essentialist properties of the sort “is T-minus” and “is T”.

minus would have.” But, Van Inwagen holds that the existence of things like the table-leg implies the existence of things like T-minus. Here is Van Inwagen:

We need only one premise to reach this conclusion [that Leg does not exist], namely that if Leg existed, Table-minus did too. And this premise seems quite reasonable, for it would seem wholly arbitrary to accept the existence of Leg and to deny the existence of Table-minus. In more senses than one, Leg and Table-minus stand or fall together. If these things existed, they would be things of the same sort. Each would be an *arbitrary* undetached part of a certain man. (Van Inwagen 1981, p. 82)

Let’s consider what van Inwagen is claiming. He says that legs stand or fall with left halves. Each is equally arbitrary. And the denial of the existence of table legs, or human legs, will depend crucially on these undetached parts being *arbitrary* undetached parts. So, van Inwagen’s argument seems to be:

- (1) T exists (Premise)
- (2) If T-minus exists, then either it is co-located with or identical to T at t. (Premise)
- (3) T-minus cannot be identical to T. (Premise)
- (4) T-minus cannot be co-located with T. (Premise)
- (5) Therefore, T-minus does not exist. (2, 3, 4)
- (6) If L exists, it would be of the same sort as T-minus (both would be arbitrary undetached parts). (Premise)
- (7) If L exists, there would be no non-arbitrary reason to deny the existence of T-minus. (Premise)
- (8) If L exists, T-minus exists. (6, 7)
- (9) Therefore, L does not exist. (5, 8)

Van Inwagen’s argument claims that there is no subregion of any object that is occupied by a material object. But first let’s be clear about how this argument helps in our rejection of premise 2. The very motivation behind the paradox was that when we add the bell to the bike, the bike is now composed of the bell and some other material object C. C occupies the space A once did before it grew. What van Inwagen’s argument aims to do is simply to deny that there is a material object C once we add the bell to the bike. When the bicycle gains the bell as a part, it is not composed of the bell and some other material object C. Rather, it is composed of the bell and many other things, but none of these things further composes a

material object. That is, A grows and there is no material object that was roughly A's shape before we added the bell. Once the bicycle occupies the space it once occupied plus the space the bell occupied, there is no single composite object occupying the space the bike once occupied. There are many things, but nothing that is composed of them. This reflects a general sort of intuition about whether or not the subregions of a material object can compose a material object. And van Inwagen is here committed to denying the possibility that anything in *any* subregion of a material object composes a composite material object. And thus van Inwagen can deny that when we add the bell to the bike, the bigger bike has a composite material object as a part. I think that we can adequately express this principle, a principle that holds there are no material objects occupying subregions of material objects as follows:

Empty Subregions Principle (ESP): For any material object X, there is no subregion of that object that is occupied by a composite material object.

With this principle in tow, we can reject premise (2) of our argument above. Should we accept ESP? Sure, there might not be any arbitrary subregions of an object that contain material objects. But should we think that there are no subregions of any material object that are occupied by material objects? I think we can make a plausible case that there are. I believe ESP loses its plausibility in the face of the following related principle. This principle denies that there are any arbitrary subregions of an object filled by a single material object, but it rejects the view that there are no subregions that are so filled.

Arbitrary Subregions Principle (ASP): For any material object X, there is no arbitrary subregion of that object occupied by a material object.

I accept ASP wholeheartedly. But why should we accept ESP? Initially, it seems deceptively simple enough. We don't want to admit left halves of tables into our ontology, for those types of things *do* seem arbitrary. But van Inwagen suggests that any subregion should be

equally arbitrary. Left halves and north sides are (paradigmatically, at least) individuated solely by their spatial location.⁴² And it seems to me that any old sub-region of an object, picked out of the blue, is likely to be arbitrary. There is no composite material object that occupies completely that subregion of my body measuring two square inches between my thumb and my wrist.⁴³

But left halves and north sides and people-minus-their-left-legs aren't the only objects that might be picked out in the subregion of some material object. There are also handles, located in subregions of coffee mugs. There are also hearts, located in subregions of persons. (And so, I maintain, there are also legs, located in subregions of persons.) But hearts and handles are only *partially* individuated by spatial location. They are also individuated by *what they do*. And if we accept that things like hearts and handles *do things*, and thus *have functions*, we have good reason to deny that left halves and hearts really are the same kind of thing. Particularly, we have good reason to deny that hearts, legs, and the like are arbitrary. And one reason to deny that they are arbitrary is that they are individuated not merely by spatial location, but by their functions. Thus, we have good reason to deny ESP.

Accepting ASP gets us enough to reject left halves and north sides as parts of material objects. And it allows us to keep those parts that function. Thus, we can allow tables to have legs as parts, and it allows legs to be material objects. One great benefit of this strategy is that it allows us to make sense of the way that macro-level objects are composed. I take five pieces of wood and cobbles them together to make a table. The table

⁴² Of course, sometimes we individuate them by things like color. We may, for instance, call the left half of the table the left half because it is painted a different color than the right half. But there is no reason to think that color should be a good criterion for marking out individual material objects. Even a simple could be partially colored. And since (by definition) simples have no parts, there is no material object that is the colored half of a simple.

⁴³ There may be some objects in that subregion like cells or molecules composed from the simples. But the point remains. There is no object fully occupying that region of simples composed from those simples.

has parts. Four legs and a top. Each leg contributes to the table's standing, while the top serves to prop other objects up. When I point to that region occupied by a single piece of wood and call it a "table leg", what I am referring to is a part that contributes to the overall functioning of the table. And thus it is a non-arbitrary part of the table.

And so it goes with eyes, ears, hands and other parts of a human being's body. So it goes with keyboards, mice, monitors and other parts of a computer. Of course there will be subregions whose occupants do not compose some further object. The region referred to by "left half of the monitor" or "top two thirds of the keyboard" will not contain a (single composite) material object. And thus we can preserve the intuitive pull behind the idea that objects can have macro-level parts, while denying that any old region is wholly filled by a single material object. We have allowed ourselves to accept van Inwagen's conclusion that T-minus does not exist, while staving off his further conclusion that L does not exist.

Consider what's wrong with van Inwagen's argument in the case of our bicycle with a bell. Before we added a bell to the bicycle, we certainly had a bicycle there. There is an object composed of a frame, gears, pedals, wheels and chains. Certainly there was a material object there *before* we added the bell. And if there was a material object there before we add the bell, why deny that there is a material object occupying that same region of space *after* we add the bell? Likewise in a case where we want to make our bicycle smaller. Consider if we want to remove our bell from the bicycle. The object that exists after the removal of the bell was *still a bicycle*. We have good reason to believe that the parts of the bike minus the bell still compose an object – a smaller bicycle roughly the size that A was before it grew.

The key here is to draw the distinction between arbitrary parts and non-arbitrary parts. Van Inwagen's argument, which strikes me as the only way of denying premise (2), assimilates all possible parts under the rubric "arbitrary parts". But what I have tried to

show in this section is that we have good reason to believe that there is an object (the bike minus the bell) occupying the region of space that is occupied by the parts of the bike minus its bell.

Of course, there will be cases in which there are not physical objects occupying subregions of a certain other physical objects. I do not believe that there is a region of space two square inches in size between my wrist and thumb that is occupied by a (single) material object. And so the conditional expressed by (2), as stated, is false. (2) will only apply for cases in which the object to which some part is taken away or added is not an arbitrary part of the growing or shrinking object. If there are no such things as left halves of tables or right halves of tables, then the table we compose from these two halves will not have two half-table shaped parts occupying exactly the region of space that the left and right halves occupy. But in our bicycle case there certainly is no good reason to believe that there is not a material object occupying the space of the bike minus the bell. Bicycles are material objects. The bike minus the bell is an object. It was that thing that we rode on our way to the bicycle shop to buy the bell. It is now occupying that region of our newfangled bike minus its bell. And as our argument has shown, it is that object that existed before the addition of the bell. So, perhaps we can revise premise (2) in accordance with what van Inwagen does get right – namely that there are no arbitrary subregions of an object occupied by a composite material object. Thus, we should not exactly reject premise (2), but revise it. We should revise it so that it keeps in line with the possibility of the existence of hearts, handles, and bicycles-minus-bells. In short, we should revise (2) such that it allows that if the thing that you add a part to grows, there is an object filling the subregion of that object that once filled the total region of that object. Let our argument now run as follows.

(1) B is a part of A after it is attached, but not before. (Growth Assumption)

- (2) * If x is a material object and grows by gaining a part, y , then x is composed of y and some other part z after y is attached. (Premise)
- (3) So A is composed of B and C after B is attached. (1,2)
- (4) C exists before B is attached to it. (Premise)
- (5) Then A and C are made of the same matter before B is attached. (1,4)
- (6) No two things can be made of the same matter at once. (Premise)
- (7) So $A = C$. (4,5,6)
- (8) So B is a part of C after it is attached (7,1, contradiction of 3)

So our growth assumption leads to a contradiction. And so, I conclude, it ought to be rejected unless we can reject another premise of the argument. As I said, the only premises up for rejection were (2) and (4). We cannot reject (2), at least as we have reformulated it.

Can we reject (4)?

Rejecting (4)

There are only two ways of staving off our argument against the possibility of objects getting bigger by gaining parts: rejecting (2) and rejecting (4). As I tried to show, rejecting the original conditional in (2) is quite acceptable in many cases (those in which the thing purportedly growing or shrinking was never an object to begin with) but not in all cases. And so I reformulated (2) such that it could not be rejected. The only other option, then, is to reject (4). But how do we do that? And what would it mean to reject (4)?

Well, of course, to reject (4) is simply to claim that C does not exist before B is attached to it. But as we noted in our rejection of (2), *something* exists before B is attached to our bike. What is it? It's our original bell-less bike A . Under the assumption that our bike grows by gaining a part, what is it that occupies the region that A once occupied? Is it A ? It does not seem so under the growth assumption. It can't be. For A occupies the region of space it occupied before it had a bell as well as the region of space occupied by the bell. That was what the gaining of a part is all about: the object occupies the region of space it once occupied and the region of space occupied by its new part.

But again we ask: what is it that occupies the region that A once occupied after the bell is added? It is a bicycle-minus-bell sized part of A: we have named this part C. C occupies exactly the region of space that A occupied before we added the bell to A.

C is where A once was and now partially is. But several important questions emerge. Where did C come from? Why was it not there before B was added to it? The problem that I am edging toward can be put as follows: how is it that an object discrete from A comes into existence just by changing the *environment* of A? It is understandable that changing the intrinsic structure of some entity can bring a discrete object into existence. If we increase the rate of molecular motion in a pot of water, we have change the pot of water into a pot of steam. By mixing two hydrogen atoms with an oxygen atom, we get an H₂O molecule. By removing the heart from a living human, we soon have a dead corpse. But by adding a bell to the frame of a bike, can we cause something bike-minus-bell shaped to *come into existence*? And by removing that bell, can we cause something bike-minus-bell shaped to *cease to exist* while ushering in the existence of some discrete object that has the exact same shape as the object that existed before the bell was removed?

The problem with denying premise (4) in our bike example is best put as follows. Before we added the bell to the bike, we had a bike that occupied a certain region of space. If we want the same bike to grow, we add a bell. That (allegedly) numerically identical bike occupies a larger region of space. And as we noted in our discussion of (2), there is a material object (the shape of A before we added the bell) occupying the region of space that A once occupied. The trouble with the denial of (4) is that it implies that some object popped into existence that is meant to be discrete from the object that was there before. And that object occupies exactly the same region of space, has the same size as and has all the matter as the object we had before the bell was added. How are we to explain this?

Imagine the scenario being described. You ride your bike down the street. Someone throws a bell at your bike as you ride it. It attaches itself to your bike. What the denial of (4) implies is that a different object pops into existence simply because the object you were riding on changed its environment.

Michael Burke has proposed a theory of material objects that amounts to a rejection of (4). Burke wants to offer a solution to such puzzles which does not allow coincidence (or co-location) of two objects at a place at a time.⁴⁴ Recall one of the puzzles of change we introduced at the beginning of this thesis: the statue and the lump. In the case of the statue and the lump, Burke wants there only to be *one* object at a place at a time, not two. His solution is as follows. The problem of the statue and the lump is generated when you have one object to which two (or more) sortals apply. Thus, when we ask ourselves the question “What is it?” when thinking about such objects, we are tempted to give more than one answer. Burke says that since there is only one thing there, there is only one thing we ought to call it. There is only one right answer to the “What is it” question. How do we determine the right answer? Burke argues that among the competing sortals, only one will be the “dominant” sortal. The dominant sortal will be the one whose satisfaction entails possession of the most in number and most diverse of properties. And so, presumably, in the statue/lump case, that object will be a statue, since satisfying the sortal statue, on Burke’s account, entails possession of a wider range of properties, including aesthetic properties.⁴⁵ So, the object in question is a statue, not a lump. But what happens to the lump? According to Burke, in creating the statue, you destroy the lump. And likewise with the Tibbles/Tib

⁴⁴ So, interestingly enough, Burke ends up endorsing (6) in our argument.

⁴⁵ This is problematic. For it is unclear that the dominant sortal really will always entail possession of a wider range of properties. (Cf. Fine 2003, p. 207 - “I do not agree with [Burke] that the range of properties ‘entailed’ by a subordinate sort is always included in the range of properties entailed by a dominant sort: a piece of gold is the kind of thing that can be more or less pure but a statue is not (or, at least, not in the same sense)” Nor is it clear that we will always be able to pick out a dominant sortal (Cf. Rea 2000 and Sider 2001, p. 165).

case. (In the Tibbles and Tib case, we have a “cat”, Tibbles. In the subregion of Tibbles is Tib, a “puss” – Tibbles minus its tail. The question is what happens when Tibbles loses his tail. Does he cease to exist? If not, does he occupy the same space as Tib? This case is relevantly analogous to van Inwagen’s T and T-minus case.) Here is a passage from Burke.

A “puss” is that part of a normal cat that includes all of the cat except its tail. Yesterday the cat Tibbles consisted of a 7-pound puss, named “Tib”, and a 1-pound tail. Earlier today Tibbles lost its tail...We can agree that yesterday there was such a thing as Tibbles’ puss. And we can agree that today there is a puss that is spatiotemporally continuous with that puss. But we can deny that today’s puss is identical with yesterday’s...Yesterday’s puss, Tib, was *merely* a puss, while today’s is also a cat. If we assume that cats are cats *essentially*, and thus *non-cats* are *non-cats* essentially, we can conclude that Tib has ceased to exist. (Rea 260)

Burke’s solution gives us an answer to (at least) two of the problems above. That of the Tib/Tibbles and that of the statue and the lump. Since Tib becomes a cat, it ceases to exist. There is only one thing there, a cat named Tibbles. And in the statue and the lump case, there is only one thing there - a statue. The lump is destroyed when the statue is created. But consider how odd all of this really is. An object is destroyed not because anything happens to it *per se* - nothing happens to Tib except falling under a different description, or satisfying another sortal - rather, it is destroyed because its environment changes. It seems reasonable to suppose that things can’t go out of existence unless something happens to *it*, not merely to its environment.⁴⁶ Do we really want to accept that artists *destroy* when they make statues? Matters become even worse when we recognize that something like statuehood is a largely (if not exclusively) *extrinsic, relational* property between an object and an artistic community. Consider this passage from Sider.

⁴⁶ This wouldn’t be the case for conventional objects like the F.B.I or the Austro-Hungarian empire. They can cease to exist because of their environment. But these objects (if you accept them as material objects, which I don’t) are radically different in kind from regular old cats and pusses. And at least part of what constitutes that difference is the respectable belief that material objects can’t be destroyed simply through sortal satisfaction or some change in its relation to an environment.

Burke's proposal does have the merit of doing away with coincidence, but it faces problems. The first is good old-fashioned implausibility. We are asked to believe that an artist can destroy a lump of clay by shaping it into a statue, and that detaching something external to it can destroy a torso! (Sider 2001, p. 163)

These are just the problems that the rejection of (4) faces in our bicycle example. The objector to mereological essentialism who wants to reject (4) ends up making claims like the following. When you detach the bell from the bike, C ceases to exist. But this implies that the removal of something external to C causes it to pop out of existence. Unacceptable. If intrinsic change occurs, especially on the level of existence/non-existence, it cannot happen to material objects just in virtue of their changing relations. Recall that our understanding of change in the previous section implied that objects themselves were the *proper subjects* of change. Things happen to objects in virtue of their intrinsic change. In fact, things happening to them constitutes their intrinsic change. But the rejection of (4) implies that C comes into existence because something happens to A (it gains a bell), and pops out of existence because something else happens to A (it loses a bell). This is not how (as our discussion earlier showed) we understand change to occur.

I (unlike Sider's passage suggests) am not *merely* charging the rejection of (4) with being implausible. That would not be reason enough to agree with me in favor of mereological essentialism. Rather, (4) drastically upends our notion of change, the very thing that theories of persistence attempt to account for. Mereological essentialism is looking for genuine change – the sort of thing that conforms to our common sense understanding of the phenomenon. What it concludes, as I have argued, is that genuine change leads to a contradiction. And that requires that we give up a certain piece of common sense. What it does not require is that we completely redescribe the phenomenon of change. The rejection of (4) does so redescribe. And so, I conclude, we cannot accept the rejection of (4).

Conclusion

And there you have it. The paradox of increase presents what I think is the strongest case that can be made for mereological essentialism. The only things to do (short of embracing perdurance and revising logic, which, as I have said, we shall not do) are to reject premise (2) or premise (4). The rejection of premise (2) (at least in its revised form: (2)*) requires you to deny the existence of things like legs and monitors, hearts and handles. The rejection of premise (4) forces you to say some very odd things about change, such that the phenomenon under discussion barely looks like change at all. Still, you might very well be happy with rejecting either (2)* or (4). I am not. And so, at the very least, those who are neutral as to whether rejecting (2)* or (4) is a bad thing ought to admit that mereological essentialism looks a shade more plausible than it did before. Those who find rejecting (2)* or (4) repellent should admit that a strong case for mereological essentialism has indeed been made. And so, I conclude, mereological essentialism has an adequate defense.

Chapter 5: What now? Some closing remarks

In this thesis I have attempted to shore up plausibility for mereological essentialism. I first tried to give a plausible account of composition and when it occurs. I concluded that there can be only one material object at a place at a time. Then I tried to confront the initial implausibility problem that mereological essentialism faces by demonstrating how the problem of persistence forces us to say something that seems to clash with our common sense thinking about objects and change. Mereological essentialism is, in this regard, one genus of a species of answers that faces the charge of implausibility. Nonetheless, I noted that many might find mereological essentialism even more implausible than its rivals. And so finally, in order to give mereological essentialism one last boost of *prima facie* plausibility, I presented the paradox of increase. I concluded that our options when faced with the paradox are rather limited and rather severe. And since I think mereological essentialism can accommodate for much of our thinking about objects, and in particular, can accommodate a notion of genuine change, I think it fares better than some of the other options that we have when faced with the paradox.

But I understand that there is much work left to be done. And I shall try to lay the foundation for that work here. There are those who will argue that mereological essentialism has such severe consequences for the way that we normally think about the world and ourselves that it is not worth embracing. In what remains of this thesis, I want to make some remarks that show how mereological essentialism can face these objections.

There are, basically, two objections. The first claims that mereological essentialism cannot accommodate our object-directed thinking. I walk into my study. I see a chair. I believe that it is the same chair that existed yesterday. Likewise, when I stare at my chair, it seems as though the same thing is there. Nothing seems to go out of existence while I stare

at the chair, even though atoms are being lost from the chair most of the time I stare at it. But according to mereological essentialism, there is not a single thing there – the chair – to which I am perceptually related. Rather, there are a number of things there – many chairs – to which I am perceptually related. Each time the chair at which I stare loses an atom, it ceases to exist and is replaced by another very similar chair. How can mereological essentialism accommodate the fact that where there are many objects, we *see* only one that seems to endure across time? And how can mereological essentialism speak for the rationality of our object directed beliefs? What could possibly explain why we get things so wrong when it comes to our object directed thinking?

A second objection emerges from the first one. People, we believe, change parts all of the time. I lose atoms when I shower, when I shave and when I sleep. But through all of that, I persist. When I eat cranberries, I gain parts, but I survive the addition of those parts. So, the objection goes, if mereological essentialism implies that when I eat a cranberry, or when I shower, shave or sleep, that I cease to exist and am replaced by a new person, then mereological essentialism is false. No matter how mereological essentialism might accommodate our object directed thinking, there is a related difficulty it faces in accommodating the claim that people can gain or lose body parts. And if mereological essentialism implies that I cannot gain or lose parts, it should not be accepted.

In the next two sections, I want to lay the groundwork for understanding exactly how mereological essentialism can address these issues. I don't pretend to offer a complete account, but I aim at least to provide tentative answers on behalf of mereological essentialism. I shall conclude that mereological essentialism can account for our object directed thinking. And I shall conclude that it might be seen as evidence for a particular way

to think about ourselves, one that implies that we are connected to, but not identical with, material objects.

Thinking about objects

In this section I want briefly to sketch a possible response that mereological essentialism can make to the following objection. It seems clear that when we think about objects, we often judge that the object we currently see is the same object as one we saw previously. For instance, I can judge that the computer at which I type is the same computer that I bought two years ago. But according to mereological essentialism, it isn't. My computer's lost lots of atoms since I bought it. And so by mereological essentialism, the computer at which I type is not the same computer as the one that I bought two years ago. Rather, there are many objects, many different computers. Mereological essentialism puts us in the awkward position of needing an account of why I believe that the computer at which I type is the same computer as the one I bought.

I think the mereological essentialist can at least explain why we (falsely) believe that the computer at which I type is the same computer that I bought, even though it has lost parts and is not the same computer. And here is a first attempt. At time t , we have a computer composed of parts $A_1 \dots A_n$. At time t^* , we have a computer composed of parts $A_1 \dots A_k$. The computer at time t^* is a different computer than the computer at time t . The latter has parts that the former lacks. And yet I judge that the computers are the same. Why is that? Well, for one, I have what seems to be a qualitatively indistinguishable computer at t^* from the one that I had at t . And second, I have what seems to be a warranted belief that the computer at time t and t^* have at least some, if not a majority, of parts in common. I also have a warranted belief that the computer that I purchased is historically related to the computer on which I type.

But none of this evidence requires that the computer at t and the computer at t^* actually are identical. What other than the identity of the two computers could explain the qualitative indistinguishability of the two computers? The fact that they are both composed of mostly the same parts. Sure, the computer at time t has more parts than the one at t^* , but they share most of their parts. And since they share most of their parts, and the arrangement of those parts has remained relatively stable, it seems reasonable to conclude that I would have a qualitatively indistinguishable experience when looking at these two computers. If I look at two pictures of a forest scene, exactly the same except for the presence of a single tree in one picture that is missing from the other picture, it would be *very* difficult for me to distinguish these two pictures. And if after I looked at one of these pictures it were unbeknownst to me switched with the other, I would judge upon looking at the replacement picture that it is the same picture as the first one I looked at. Likewise, given that the two computers that produce my visual experience are *very much* the same, it is difficult (if not impossible) for me to distinguish the two. I judge that they are the same thing because they look the same to me, and I also assume that if an object at time t and an object at t^* look the same and have the same history, then I take this (along with anti-skeptical assumptions) to be good evidence that they are the same thing. My perceptual evidence and beliefs about shared history are part of my reason for believing the two computers are the same thing.

It should be an old story that perceptual evidence is defeasible. I have good reason for judging that the dog in my apartment now is the same dog that was there before. I make this judgment based on perceptual judgments and perhaps some anti-skeptical assumptions. But I could be wrong. The dog in my apartment could well be a perfect duplicate of my dog, not the dog that I purchased. But when I judge that the dog in my apartment is the

same dog, I do so for good reason, even though I could be wrong. My perceptual judgments of identity are defeasible.

My perceptual judgments of identity in the case of the computers are also defeasible. And they too are based on good reasons. I judge that the computer at t and the computer at t^* are the same because they look the same and I believe that they share a relevant history. And my judgment that the two computers are identical is a good one. For the two computers in the case I describe *do* share a relevant history. The computer on which I type is historically related to the one that I purchased. They both have many parts that were present when I purchased the computer. And for that reason, the computer I purchased is much more closely related to the computer on which I type than *any other* computer there may be in the world.

But the fact that two things share many (but not all) parts and share a history is perfectly compatible with there being two discrete objects, one at t and one at t^* . Our evidence for there being one computer and our evidence for there being two, then, are the same: perceptual, historical, and anti-skeptical. The reason that there are two computers instead of one is that mereological essentialism is true. A mereological essentialist can explain why we believe that two things are actually one. We generally believe that something that produces a particular perceptual appearance and has a particular history is identical with something that produces a qualitative indistinguishable perceptual appearance and has a shared history. And we also tend to believe that relatively minor losses or gains of parts do not cause an object to cease to exist. The reason we are wrong has to do with certain metaphysical truths that I have explored throughout this thesis. We are wrong in our belief that two objects with distinct parts can be identical. But we are wrong for deep

metaphysical reasons. It is not a miserable cognitive or intellectual failure on our part to miss such a metaphysical truth.

This is a start, and something that I hope to explore further. My basic idea is that we have good, but defeasible, reasons for believing that where there are actually two things there is but one. And we can explain why our object directed thinking contains many false judgments of identity. We tend to think that perceptual equivalents are historical equivalents, and that historical equivalents are identicals. But the things we judge to be identical, for metaphysical reasons, cannot be. We are not stupid. We just have good reasons for believing something that is not true. I realize that many will not be convinced. But some will. But what most people will not accept is that people cannot survive the loss of a finger, the loss of a hair or the loss of an atom. People lose parts all the time. And yet surely I persist through change.

Self-directed thinking

I want to close the thesis with a brief discussion of the implications that mereological essentialism has for our self-directed thinking. My purpose is to explain that mereological essentialism is not itself committed to the view that people cannot survive the loss of body parts. That requires a further assumption about what people are. And mereological essentialism is silent about what people are. It is consistent with mereological essentialism that persons persist through changes in their bodies. All that is required is the claim that persons are not identical with their bodies.

This morning I shaved and showered after waking from a restful sleep. Last night when I went to bed, my body was composed of many things, some of which did not compose my body this morning. A few hairs fell out of my head, a few skin cells were lost. There were some whiskers on my face that I shaved off this morning. My body went

through these changes. But it seems obvious that I am this morning the same person that I was when I went to bed. Surely *I* can survive shaving!

Some might put forth the following objection. Mereological essentialism claims that when you went to bed your body was composed of a certain set of atoms. Your body had a certain set of parts. And yet many of those parts that composed your body no longer compose your body after you showered and shaved. Your body lost many of its parts. And so, mereological essentialism says, you do not survive the loss of these parts. And thus, mereological essentialism is beyond belief. It implies that people cannot survive the loss of such parts that occurs when one sits, sleeps, showers, shaves.

But mereological essentialism is in no way committed to a particular view about what it takes for a person to be the same person from one time to another. There are many views about what necessary and sufficient conditions must be met in order for a person to persist through time. One of them says that in order for a person to persist through time, he must have the same body. Another says that in order for a person to persist through time, he must be the same animal. Yet another says that a person must have the same brain in order to persist through change. Another says that psychological continuity is the proper criterion for personal identity over time.

It should be clear that of these options, the first three would indeed, when combined with mereological essentialism, imply that I do not survive my showering, shaving, and sleeping. For if I am identical with a body, then that body's loss of parts entails the non-existence of that body. So if I exist and am my body, I cannot survive the loss of parts of my body. A new body, and thus a new person, pops into existence and an old one is destroyed with each loss or gain of a part of one's body.

A similar consequence is likely to affect the brain view of personal identity. A brain is a dynamic entity, just like a body. And so mereological essentialism, when coupled with the brain view, tells us that a person cannot survive the loss or gain of a part of his or her brain. As the last chapter argued, material objects *can't survive* a gain or loss of parts. And so if a person is a brain, then a person cannot survive that gain or loss to a brain either. You have a different brain than before the addition of the part. And likewise, you are a different person.

Depending on what you take an animal to be, an animalist view of personal identity might, when coupled with mereological essentialism, imply that when your body loses a part an animal ceases to exist. It all depends on what you take an animal to be. Let's say that you take an animal to be identical with a body that is alive. But that just means that the animal cannot survive the loss of any parts. As I have shown above with the bodily view, for two bodies to be identical, they (at least) must have all the same parts. And if an animal is identical with a living body, then whenever that living body loses a part, a new living body is ushered in, and so (by transitivity of identity) a new animal is brought in. (I don't quite know what else an animal might be.) But it should be obvious that if an animal is a living body, and a person is (identical with) an animal, then a person cannot survive the loss of a part of his body.

In order to preserve personal survival through change of body parts, one would need to make one of two claims. One must either claim that a person is a simple – an entity with no parts – or one could adopt a psychological criterion of identity over time. If a person is a simple, then he has no parts to lose. (And there are those (like Zimmerman 1998b) who have described just how people could be simples. One way, of course, is believe that people are identical with souls, where souls are understood to be immaterial, partless objects.) If

you believe that the psychological criterion of personal identity is true, then a body can lose parts while the same person remains in existence insofar as that person retains the relevant psychological continuity. A body can lose parts, and thus cease to exist, while the person remains the same.

I am not here to endorse either view. But I am here to say that if you want it to be the case that people can survive the loss of certain of their body parts, then you had better take one of these two routes. In fact, you might want to take mereological essentialism to be positive evidence *against* any view of personal identity that holds that we are identical with composite material objects of any kind. For in the dynamic world in which we live, material objects – like our bodies – gain and lose parts all the time (and thus a body ceases to exist and is replaced by a distinct body). And since we believe that we survive the loss and gain of material parts to our bodies, what can make that true is the fact that we are not identical with a composite material object.

I anticipate that there will be many unsatisfied with these consequences for our thinking about persons. But to these critics I recommend another look at the paradox of increase. For my money, the paradox of increase tells us that either people are composite material objects or they can survive the gain or loss of body parts. Not both. If people are material objects, then they do not survive the loss of their parts. All the more reason for believing that people are not composite material objects.

In closing, I remind the reader that it is not the aim of my thesis to defend any particular view of personal identity over time. All I want to do is defend mereological essentialism from the charge that it itself implies that people cannot survive the loss or gain of parts. It doesn't. Mereological essentialism tells us that *material objects* cannot lose or gain parts. It is up to a theory of personal identity to tell us *whether or not* people are material

objects. And if we want to be able to survive the losses and gains of parts of our bodies, then we had better not combine mereological essentialism with a theory of personal identity that holds that people are identical to bodies. If we are material objects, we are simple and not composite. Bodies (at least normal human bodies) are composite objects that gain and lose parts. We cannot be objects with parts to be gained or lost. And so we discover that we cannot be our bodies.

Bibliography

- Alexander, Samuel (1927), *Space, Time, and Deity* vol. 2 (London: Macmillan).
- Baxter, Donald (1988a), "Identity in the Loose and Popular Sense", *Mind*, 97: 575-82.
- (1988b), "Many-One Identity", *Philosophical Papers*, 17: 193-216.
- Burke, Michael (1994), "Preserving the Principle of One Object to a Place: A Novel Account of the Relations Among Objects, Sorts, Sortals, and Persistence Conditions", *Philosophy and Phenomenological Research*, 54: 591-624; reprinted in and page citations for Rea (1997).
- Carter, W.R. (1983), "In Defense of Undetached Parts", *Pacific Philosophical Quarterly* 64: 126-143.
- Chisholm, Roderick (1976), *Person and Object* (LaSalle, Il: Open Court).
- Fine, Kit (2003), "The Non-Identity of a Material Thing and Its Matter", *Mind*, 112: 195-234.
- Goodman, Nelson (1951), *The Structure of Appearance* (Cambridge, Ma: Harvard University Press).
- Haslanger, Sally (2003), "Persistence over Time" in Michael Loux and Dean Zimmerman (eds.) *Oxford Handbook of Metaphysics* (Oxford: Oxford University Press).
- (1989), "Endurance and Temporary Intrinsic", *Analysis*, 49: 119-25.
- Hawley, Katherine (2001), *How Things Persist* (Oxford: Clarendon Press).
- (1998), "Why Temporary Properties are not Relations between Physical Objects and Times", *Proceedings of the Aristotelian Society*, 98: 211-16.
- Hudson, Hud (2001), *A Materialist Metaphysics of the Human Person* (Ithaca: Cornell University Press).
- Johnston, Mark (1992), "Constitution is not Identity", *Mind*, 101: 89-105.
- Jubien, Michael (1993), *Ontology, Modality, and the Fallacy of Reference* (Cambridge: Cambridge University Press).

- Kim, Jaegwon (1993), *Supervenience and Mind* (Cambridge: Cambridge University Press).
- Leonard, Henry S. and Nelson Goodman (1940), "The Calculus of Individuals and Its Uses", *Journal of Symbolic Logic*, 5: 45-55.
- Lewis, David (2002), "Tensing the Copula", *Mind*, 111: 1-14.
- (1991), *Parts of Classes* (Oxford: Blackwell).
- (1986), *On the Plurality of Worlds* (Oxford: Blackwell).
- (1973), *Counterfactuals* (Oxford: Blackwell).
- (1971), "Counterparts of Persons and Their Bodies", *Journal of Philosophy*, 68: 203-11.
- (1970), "Anselm and Actuality", *Nous*, 4: 184-5.
- Markosian, Ned (1998), "Brutal Composition", *Philosophical Studies* 92: 211-49.
- Mellor, D.H. (1981), *Real Time* (Cambridge: Cambridge University Press).
- Merricks, Trenton (2001), *Objects and Persons* (Oxford: Clarendon Press).
- (1998), "There are No Criteria of Identity over Time", *Nous*, 32:106-24.
- (1995), "On the Incompatibility of Enduring and Perduring Entities", *Mind*, 104: 523-31.
- (1994), "Endurance and Indiscernibility", *Journal of Philosophy*, 91: 165-184.
- Noonan, Harold (1993), "Constitution is Identity", *Mind*, 102: 133-46.
- Olson, Eric (1997), *The Human Animal* (Oxford: Oxford University Press).
- Quine, W.V.O. (1960), *Word and Object* (Cambridge, Ma: MIT Press).
- Rea, Michael. (1997), *Material Constitution: A Reader* (Lanham, Md.: Rowman and Littlefield).
- (2000), "Constitution and Kind Membership", *Philosophical Studies*, 97: 169-93.
- Sider, Theodore (2001), *Four-Dimensionalism*. (Oxford: Oxford University Press).
- (1993), "Van Inwagen and the Possibility of Gunk", *Analysis*, 53: 285-9.
- Thomson, Judith Jarvis (1998), "The Statue and the Clay", *Nous*, 32: 149-73.

- (1983), "Parthood and Identity Across Time", *Journal of Philosophy*, 80: 201-20.
- Van Cleve, James (1986), "Mereological Essentialism, Mereological Conjunctivism, and Identity through Time", in P. French and T. Vehling Jr., and H. Wettstein (eds.), *Midwest Studies in Philosophy* vol. xi (Minneapolis: University of Minnesota Press).
- Van Inwagen, Peter (2001), *Ontology, Identity and Modality*. (Cambridge: Cambridge University Press).
- (1994), "Composition as Identity", in J.E. Tomberlin (ed.) *Philosophical Perspectives*, I, *Metaphysics* (Atascadero, Ca: Ridgeview); reprinted in and page citations for Van Inwagen (2001).
- (1990a), "Four-Dimensional Objects", *Nous*, 24: 245-55; reprinted in and page citations for Van Inwagen (2001).
- (1990b), *Material Beings* (Ithaca, NY: Cornell University Press).
- (1981), "The Doctrine of Arbitrary Undetached Parts", *Pacific Philosophical Quarterly*, 62: 123-37; reprinted in and page citations for Van Inwagen (2001).
- Wasserman, Ryan (2002), "The Standard Objection to the Standard Account", *Philosophical Studies*, 111: 197-216.
- Wiggins, David (1968), "On Being in the Same Place at the Same Time", *Philosophical Review*, 77: 90-5; reprinted in and page citations for Rea (1997).
- Zimmerman, Dean (1998a), "Temporal Parts and Supervenient Causation: The Incompatibility of Two Humean Doctrines", *Australasian Journal of Philosophy*, 76: 265-288.
- (1998b), "Criteria of Identity and the Identity Mystics", *Erkenntnis* 48: 281-301.
- (1996), "Could Extended Objects be Made out of Simple Parts? An Argument for 'Atomless Gunk'", *Philosophy and Phenomenological Research* 56: 1-29.

----- (1995), "Theories of Masses and Problems of Constitution", *Philosophical Review*, 104: 53-110.