

THE OXFORD HANDBOOK OF

.....
METAPHYSICS
.....

Edited by

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AND

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OXFORD
UNIVERSITY PRESS

OXFORD

UNIVERSITY PRESS

Great Clarendon Street, Oxford OX2 6DP

Oxford University Press is a department of the University of Oxford.
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Oxford New York

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Published in the United States
by Oxford University Press Inc., New York

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First published 2003

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British Library Cataloguing in Publication Data
Data available

Library of Congress Cataloging in Publication Data
Data available

ISBN 0-19-825024-X

1 3 5 7 9 10 8 6 4 2

Typeset by Newgen Imaging Systems (P) Ltd., Chennai, India
Printed in Great Britain
on acid-free paper by
Butler & Tanner Ltd., Frome, Somerset

ACKNOWLEDGEMENTS

Thanks are due to Peter Momtchiloff, who provided help and encouragement at every stage of this project. Thanks also to Margaret Jasiewicz, Cheryl Reed, Tina Elkins, Linda Lange, and David Manley, who worked on the preparation of the manuscript. And special thanks to Noell Birondo, who handled the page proofs and oversaw the final stages of the project.

- Rynasiewicz, Robert (1996a). 'Absolute vs. Relational Space-time: An Outmoded Debate?' *Journal of Philosophy*, 93: 279–306.
- (1996b). 'Is there a Syntactic Solution to the Hole Problem?' *Proceedings of the Philosophy of Science Association*, 3, suppl., S55–S62.
- (2000). 'On the Distinction between Absolute and Relative Motion'. *Philosophy of Science*, 67: 70–93.
- Sarkar, Sahotra, and John Stachel (1999). 'Did Malament Prove the Non-Conventionality of Simultaneity in the Special Theory of Relativity?' *Philosophy of Science*, 66: 208–20.
- Shapiro, Lionel S. (1994). "'Coordinative Definition" and Reichenbach's Semantic Framework: A Reassessment'. *Erkenntnis*, 41: 287–323.
- Sklar, Lawrence (1974). *Space, Time and Space-time*. Berkeley: University of California Press.
- (1985). *Philosophy and Space-time Physics*. Berkeley: University of California Press.
- Stachel, John (1980). 'Einstein's Search for General Covariance'. Paper presented to the Ninth International Conference on General Relativity and Gravitation, Jena. Repr. in D. Howard, and J. Stachel (eds.), *Einstein and the History of General Relativity*, Einstein Studies, 1. Birkhauser.
- (1993). 'The Meaning of General Covariance', in John Earman, Clark N. Glymour, and John J. Stachel (eds.), *Philosophical Problems of the Internal and External Worlds: Essays on the Philosophy of Adolf Grünbaum*. Pittsburgh: University of Pittsburgh Press.
- Stein, Howard (1967). 'Newtonian Space-Time'. *Texas Quarterly*, 10: 174–200.
- (1977). 'Some Pre-History of General Relativity', in John Earman, Clark N. Glymour, and John J. Stachel (eds.), *Foundations of Space-Time Theories*. Minneapolis: University of Minnesota Press, 3–49.
- (1993). 'On Philosophy and Natural Philosophy in the Seventeenth Century', in P. French, T. Uehling, Jr., and H. Wettstein (eds.), *Midwest Studies in Philosophy*, xviii: *Philosophy of Science*. Notre Dame: University of Notre Dame Press, 177–201.
- Suppes, Patrick (ed.) (1973). *Space, Time and Geometry*. Dordrecht: Reidel.
- Teller, Paul (1991). 'Substance, Relations, and Arguments about the Nature of Space-Time'. *Philosophical Review*, 50: 363–97.
- Torretti, Roberto (1983). *Relativity and Geometry*. Oxford: Pergamon Press.
- (1999). *The Philosophy of Physics*. Cambridge: Cambridge University Press.
- van Cleve, James, and Robert Frederick (eds.) (1991). *The Philosophy of Left and Right: Incongruent Counterparts and the Nature of Space*. Dordrecht: Kluwer.
- Wilson, Mark (1993). 'There's a Hole and a Bucket, Dear Leibniz', in P. French, T. Uehling, Jr., and H. Wettstein (eds.), *Midwest Studies in Philosophy*, xviii: *Philosophy of Science*. Notre Dame: University of Notre Dame Press, 201–41.
- Winnie, John (1970). 'Special Relativity without One-Way Velocity Assumptions'. *Philosophy of Science*, 37: 81–99; 223–38.
- (1977). 'The Causal Theory of Space-Time', in John Earman, Clark N. Glymour, and John J. Stachel (eds.), *Foundations of Space-Time Theories*. Minneapolis: University of Minnesota Press, 134–205.

CHAPTER 11

PERSISTENCE THROUGH TIME

SALLY HASLANGER

1. THE PUZZLE(S)

THINGS change: objects come into existence, last for awhile, go out of existence, move through space, change their parts, change their qualities, change in their relations to things. All this would seem to be uncontroversial. But philosophical attention to any of these phenomena can generate perplexity and has resulted in a number of long-standing puzzles.¹

One of the most famous puzzles about change threatens to demonstrate that nothing can persist through time, that all existence is momentary at best. Let's use the term 'alteration' for the sort of change that occurs when a persisting object changes its properties, e.g. when a tomato ripens and turns red, when a candle shortens as it burns, when someone's face brightens with a smile. Suppose I put a new 7-inch taper on the table before dinner and light it. At the end of 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

Thanks to Roxanne Fay, Ned Hall, and Steve Yablo for comments on earlier drafts. Special thanks to Dean Zimmerman for his ongoing patience in addition to his excellent comments and editorial advice. This chapter is dedicated to the memory of David Lewis.

¹ There are puzzles concerning motion (e.g. Zeno's paradoxes; Sainsbury 1995, ch. 1), constitution (Rea 1996), generation and destruction (Parmenides; Haslinger 1989b), growth (Aristotle), and the replacement of parts (the Ship of Theseus; Hobbes 1839, ch. 2, sect. 7; Chisholm 1970, 1973, 1975).

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.

It is not hard to see that the heart of this puzzle concerns the very concept of alteration. Alteration involves a change of properties: the object has a property before the change that is incompatible with one it has after the change. But objects cannot have incompatible properties. So no object can persist through a change in its properties, i.e. alteration is impossible. Add the straightforward assumption that the passage of time involves change (for example, if something persists through time, then at the very least it is older at the later time than it was at the earlier time), and it seems we must conclude that nothing persists through time at all. This result is paradoxical because it contradicts what we take to be obvious, namely, that some things persist through time and through change.

It will be helpful to articulate some of the principles that work together to generate the problem. Let's start with these:

- (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*.

Fortunately, these three principles, on their own, do not yet generate a contradiction. This is because we have left unspecified what it is for something to 'persist' through change and what it is for a property to be 'involved' in a change, and there are interpretations of these notions that render (1)–(3) consistent. So we should be optimistic that there are solutions to the problem that allow us to preserve (1)–(3). But if the problem does not lie in accepting (1)–(3), where exactly is it, and how can we avoid it?

Two further principles elaborate what seem to be additional essential features of alteration:²

- (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.

² Note that these principles are stated in what I hope to be a form that is not committal with respect to one's account of time, or tense, or the details of one's ontology. In fact, the strategies I will consider to avoid the paradox will involve providing more specific (and controversial) interpretations of these principles.

- (5) *Proper subject condition.* The object undergoing the change is itself the proper subject of the properties involved in the change; for example, the persisting candle is itself the proper subject of the incompatible properties.

Now it seems we have the makings of a contradiction. To simplify the example, suppose one morning, in preparation for dinner that evening, I put my new 7-inch taper in the candlestick and set it on a shelf next to the window. The day is unexpectedly hot, and when I return from work I find that the sun has softened the wax and my taper is bent. Suppose that the candle persists through the change from straight to bent. That is to say that there is *one thing*, the candle, that is the *proper subject* of the property straightness and of the property bentness. But straightness and bentness are incompatible: nothing can be both straight and bent. In the face of this contradiction, there are a number of possible conclusions to draw. Contrary to appearances, one of the principles we started with must be false. So either:

- (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.

Let us consider some of these options more carefully.

2. PERSISTENCE: PERDURANCE, ENDURANCE, AND EXDURANCE

Although one possible response to the puzzle is to maintain that in fact nothing persists through time, this is usually seen as a course of last resort. The idea that objects persist is so deeply rooted in our ordinary conception of things, it has taken on the status of a Moorean fact which all parties to the debate must accommodate.

It is controversial, however, what exactly is required for something to persist through a stretch of time. Several conceptions of persistence have been developed in recent literature. Two prominent ones are: *endurance* and *perdurantism* (Lewis 1986: 202).³ Roughly, an object persists by *enduring* iff it is *wholly present* at different times.⁴ For example, the candle endures iff the candle itself is wholly present at

³ I will return to a third conception of persistence, *exdurantism*, below.

⁴ Some have argued that this definition of endurance is unclear or untenable and have proposed alternative definitions. See Sider (1997); Merricks (1999).

t (in the morning when I set it on the shelf), and it is also wholly present at a distinct time t' (in the afternoon when I return. . . and presumably in the intervening times). The notion of being 'wholly present' may become clearer by contrast with the perdurantist's notion of being 'partly present'. On the perdurantist's conception of persistence, an object persists through time in a way analogous to how an object is extended through space. The candle is spatially extended through its 7-inch length not by being wholly present at each spatial region it occupies, but by having parts at the different regions. Likewise, according to the perdurantist, the candle is extended through time not by being wholly present at different times, but by having parts or stages at different times. So the candle persists by *perduring* iff the candle has a part at t (in the morning when I set it on the shelf), and a part at a distinct time t' (in the afternoon when I return. . . and presumably in the intervening times).

The notion of perdurance provides the resources for a relatively straightforward account of alteration (e.g. Quine 1963; Hirsch 1982; Lewis 1983; Heller 1993; Sider 2001): the persisting candle is composed of temporal parts or stages that only briefly exist; distinct *candle-stages* are the proper subjects of the incompatible properties, *being straight* and *being bent*, and the temporal composite which consists of the stages is the subject of persistence (understood as perdurance). On the perdurance account, the persisting object does not undergo alteration by 'gaining' or 'losing' properties; instead, it changes in a way analogous to how a painting changes colour across the canvas. The canvas is green at this part and blue at another; the candle is straight at this part and bent at another. Contradiction is avoided by modifying the proper subject condition: the persisting thing (the composite) is not the proper subject of the properties 'gained' and 'lost' (the stages are), but the proper subjects of the properties are at least parts of the persisting thing. For the perdurantist, this is close enough.

On this account, persisting things are temporally extended composites, also known as a space-time worms. But given the ontology of worms and stages, the option of yet another account of persistence arises. According to the *stage theory*, ordinary persisting objects are stages that persist not by enduring or perduring, but by having distinct stage counterparts at other times. Stage theory says that in the afternoon when I find my bent candle on the shelf, the candle is the bent-stage coexisting with me then, but that stage persisted from before (in the relevant sense) by virtue of having a (straight) counterpart stage on the shelf in the morning. (Sider 1996: 446; 2000: 86–7; Hawley 2001, esp. ch. 2). Although on this view ordinary objects are stages and so (strictly speaking) only exist momentarily, they can nonetheless persist by virtue of having counterpart antecedent and/or successor stages.

The idea behind this view is to treat identity over time as analogous to identity across possible worlds in modal counterpart theory. Consider: David Lewis might not have been a philosopher. On a counterpart theory this is true not because Lewis exists in a different possible world in which he never takes up philosophy, but

because there is a world in which a *counterpart of Lewis* never takes up philosophy (Lewis 1986: 9–11 and ch. 4). Similarly, the morning's straight candle(-stage) persists as the afternoon's bent candle(-stage) not by the earlier entity *itself* existing at the later time, but by virtue of the latter stage being a counterpart of the earlier one.⁵ Let's call this form of persistence *exduring* (duration via the object's relation to entities other than or outside of it).

It is important to emphasize that the current defenders of the stage theory do not disagree with perdurantists over ontology: both views agree that there are stages and composites of stages ('worms'). Stage theory differs from the perdurance view in two important respects: (i) it allows exdurance to count as a form of persistence, and (ii) it maintains that *ordinary* things are stages that persist by exduring, rather than composites that persist by perduring. In principle there could be a version of the stage theory which denies that there are perduring things and claims instead that there are only stages and the only way for something to persist is by exduring. (This might be a promising strategy for someone who favours an ontology without enduring things but is also opposed to unrestricted mereological composition.) But, as it stands, the debate between the perdurance and exdurance theorists does not concern the existence of perduring things.

In sum, we so far have three views of persistence to consider:

Perdurance theory. Objects persist only by perduring. There are perduring, but no enduring or exduring, particulars.

Exdurance theory (aka stage theory). Ordinary objects persist by exduring. There are (weird) perduring particulars, and no enduring particulars.

Endurance theory. Ordinary objects persist by enduring. There are enduring particulars, and there may or may not be perduring or exduring particulars as well.

Cast in these terms, it appears that the original puzzle has faded into the background: the issue is not whether it is coherent to claim that some things persist through time and through change. All parties to the debate at this point can allow that there are perduring things, so if perdurance counts as a form of persistence, there are things that persist. The question is *how* things persist. More specifically, bracketing the question of what sort of persistence might be enjoyed by weird objects, the question is: Do ordinary objects—particulars such as apples and bananas, candles and daffodils—persist by perduring, exduring, or enduring?⁶

⁵ Theorists differ in what they take the relevant counterpart relations for persisting objects to be. For example, Katherine Hawley argues that the relations between stages that constitute an ordinary ('natural') object will be 'non-supervenient', i.e. they are not wholly determined by the intrinsic properties of the relata, and are not spatio-temporal relations (Hawley 2001, ch. 3, esp. sects. 3.1, 3.6). Sider, however, is not committed to this (Sider 1996).

⁶ Some have found it tempting to claim that the disagreements between these options is only 'verbal' or 'terminological' and not ontological. I argue in Haslinger (1994) that there is a substantive

However, one might reasonably resist this reframing of the problem. If the original challenge was to show how *alteration* is possible, not just *persistence*, then it isn't clear that this has yet been accomplished. On neither the perdurance theory nor stage theory is there a single thing which is the proper subject of the incompatible properties involved in the change: in both cases distinct stages are the proper subject of the changing properties; perduring and exduring things do not in any obvious way alter. The appearance of alteration is accounted for, strictly speaking, by a succession of stages. It seems that the promise of genuine alteration is held out by the endurance theory, but we have not yet seen how an endurance theory avoids the original puzzle. Following this line of thought the question remains: Is alteration *really* possible?

Although there is something important to this concern (and I will return to discuss elements of it further below when I consider further the *proper subject condition*), it isn't entirely fair to the perdurantist and exdurantist. Remember that the puzzle presents us with what at least appears to be an inconsistent set of claims. One cannot 'solve' such a puzzle without rejecting or reinterpreting one or another (or several) of the claims at issue. None of the theories before us will be able to preserve exactly what we started with. What counts as a 'solution', then, and what criteria we should use to evaluate different solutions is, at this point, somewhat unclear; for example, are some of the principles more important to preserve than others? Have we misstated or stated too vaguely any of the intuitions at issue? How concerned should we be to preserve our initial intuitions? Pausing here to address these methodological questions would be useful, but also distracting; in particular, it could easily pre-empt an open exploration of the options still before us. So I shall continue to lay out a range of options worth considering. But we should keep in mind that there may be background disagreements between the different parties to the debate about what exactly are the goals and priorities of our inquiry. We shall return to some of the methodological questions along the way.

3. PRESENTISM, NON-PRESENTISM (OR ETERNALISM), AND SERIOUS TENSING

In the previous section I suggested that debate between the perdurantist, endurantist, and exdurantist is not over the existence of perduring things; the perdurantists'

disagreement between the perdurance and endurance theories, and the argument could be extended to show that there is a substantive disagreement between the endurance and exdurance theories. I leave the task of showing that there is a substantive disagreement between perdurantism and exdurantism to others.

ontology of stages and worms can be accepted by stage theorists and endurantists. Rather, ontologically speaking, the issue is whether there are enduring things *in addition to* stages and worms. Recently, however, some have maintained that the background ontologies of perdurance and endurance are incompatible: it is not possible for a world to have both perduring and enduring particulars. If this is the case, then we cannot set aside so quickly the question whether there are perduring things to focus on how ordinary things persist, for commitment to perduring (or exduring) things would rule out endurance.

Those who hold that perdurance and endurance are incompatible maintain that each entails different understandings of time (Carter and Hestevold 1994; Markosian 1994; Merricks 1995; Lombard 1999; cf. Parsons 2000; Simons 2000a). More specifically, the suggestion is that perdurantism is committed to a four-dimensional ontology on which all times equally exist, and endurantism is committed to a three-dimensional ontology on which only the present and presently existing things are real. This debate is valuable to consider because it highlights how the views of persistence we've considered so far are related to other significant theses about time and tense, and also because it introduces one endurantist model for addressing the original puzzle.

To begin, we need to distinguish a presentist from a non-presentist account of time.⁷ According to the presentist, only the present exists, and consequently only present objects exist. Socrates *existed*, and future objects *will exist*, but because they do not presently exist, we cannot truly claim that they exist (e.g. Hinchliff 1996; Bigelow 1996; Zimmerman 1998a; Markosian forthcoming). The presentist's ontological claims are often connected to a semantic thesis asserting the irreducibility of tensed to untensed predication.⁸ On this view, to say that something exists, or walks, or is red, is to say something about how it is in the present, not 'timelessly'. A non-presentist (also called an 'eternalist' (Sider 1999: 326) and sometimes a 'four-dimensionalist' (Rea, Chapter 9 in this volume)),⁹ denies that only the present exists, and allows that there are things that do not presently exist, i.e. there are entirely

⁷ Note that there are different forms of presentism and non-presentism. Presentists may differ not only in their account of the semantics of tensed statements, but also in their ontologies (cf. Hinchliff 1996; Simons 2000b). Non-presentists may differ substantially also in their semantics and their accounts of time; for example, some non-presentists claim that no time is ontologically privileged, while others deny this (existence and non-existence are not the only forms of ontological privilege). For example, on the 'flashlight' or 'moving spotlight' view of time, all times exist, but one is privileged by being present (it is the one on which the spotlight of the present shines).

⁸ Note that an eternalist may also maintain that tensed discourse is irreducible to untensed discourse, for tense may be essentially indexical. So the semantic thesis does not distinguish the presentist from non-presentist. I will consider related metaphysical commitments to tense below. For useful discussion of the interwoven claims of presentism and serious tensing, see Sider (2001, ch. 2); Zimmerman (1998a).

⁹ Note that the term 'four-dimensionalism' is used in different ways by different authors, and is sometimes used to refer simply to perdurantists. Ted Sider offers one clear statement of 'four-dimensionalism' that takes its central idea to be that 'for any way of dividing up the lifetime of an object into separate intervals of time, there is a corresponding way of dividing the object into temporal parts

past or entirely future things: According to eternalism, Socrates exists, but does not presently exist; to say that Socrates was wise is to say something true of an existing but non-present thing.¹⁰

Presentism is also closely allied with, though distinguishable from, a metaphysical claim asserting that propositions (or whatever one takes the bearers of truth to be) are tensed entities that concern how things were, are, and will be rather than how things timelessly *are*. On this view, because propositions are tensed entities, they are not timelessly true or false, but are, were, or will be true or false, i.e. their truth or falsity is a tensed matter (Zimmerman 1998a, 208–9). This approach, sometimes called the ‘*serious tenses*’ approach, allows in principle that there are non-present things, so must be distinguished from presentism (see Zimmerman 1998a; Markosian 2001; for an example, Smith 1993).¹¹ Presentism is a view about what exists (only the present and things existing in the present); in contrast, serious tensing is a view concerning what is true or false about the things that exist (only tensed propositions).

What does it mean to say that propositions (or what some might prefer to call states of affairs) are tensed entities?¹² Consider:

- (a) The apple is (presently) green.
- (b) The apple was green.

According to the serious tenses, (a) and (b) express distinct propositions. Suppose the apple starts out green, in which case (a) is true; but as the apple turns red the proposition (a), that the apple is (presently) green, becomes false, though now (b) is true. (Speaking of states of affairs, the apple’s being (presently) green ceases to obtain, as it turns red.) On this view, one’s having a property is, metaphysically speaking, always something that occurs in the present: what obtains is what presently

that are confined to those intervals of time.’ (Sider 1997: 204). Because of the potential misunderstandings, I prefer to avoid the term ‘four-dimensionalism’ and disaggregate the theses at issue, speaking instead of presentists–eternalists, perdurantists–endurantists, serious tenses–non-tenses, etc.

¹⁰ Note that how one understands time and how one understands the semantics of tensed discourse are to some extent separable. One might hold an eternalist account of time, and yet hold that tensed discourse is not reducible to untensed discourse (see Sider 2001, esp. ch. 2). Those who believe that tensed discourse is not reducible to untensed discourse are also sometimes called ‘tenses’, sometimes those ‘who take tense seriously’ (Zimmerman 1998a). Early influential discussions of the ontology of tense include McTaggart (1908); Prior (1959).

¹¹ Thanks to Dean Zimmerman for helping me understand better the distinction between presentism and serious tensing. Zimmerman (1998a) is very valuable in clarifying the issues.

¹² Although serious tenses tend to claim that all predication is tensed, so all propositions are tensed, it isn’t clear to me why one couldn’t hold the weaker view that there is both tensed and untensed predication, and some propositions are tensed and others are untensed. Simply allowing untensed predication (and tenseless facts) does not commit one to saying that tensed predication can be analysed in terms of tenseless predication, or that the untensed facts are primitive. But I admit a certain amount of confusion on these issues.

obtains, but what presently obtains captures the sequence of past, present, and future in different sorts of tensed facts. Socrates *was* wise; the Dalai Lama *is* wise. These two statements attribute wisdom to Socrates and the Dalai Lama respectively, from the point of view of the present, so to speak. But on the serious tenses approach there are two different predicative relations to wisdom at issue: being (presently) wise and having been wise.¹³ One way to capture this would be to say that instantiation comes in three flavours: past (‘was’), present (‘is’), and future (‘will be’), and apparently ‘tenseless’ instantiation must be understood in terms of these other three.¹⁴ I will return to the issue of taking tense seriously below. But it is important to recognize that although a presentist who wants to make claims about the past and future is committed to serious tensing, at least in principle, serious tensing is an option for non-presentists as well.

With a clearer differentiation of views, let’s return to the argument that perdurance and endurance are incompatible. The crucial claim is that perdurance entails non-presentism and endurance entails presentism. Because, the argument goes, presentism and non-presentism are incompatible, it is not possible for there to be both perduring and enduring things. The endurance side of the argument is this: Suppose some things endure through change. If all times are equally real, and if a changing object is wholly present at different times, then the object must have incompatible properties. But this is impossible. (Note that, in effect, this is just the original puzzle.) So if a changing object is wholly present at different times, then not all times are equally real; only the present exists. Thus endurance entails presentism. (See e.g. Merricks 1995: 526–7.)

This argument, however, is unconvincing because it ignores a number of controversial issues. The allegation is that an object cannot be wholly present at different times while undergoing change. But why not? Looking back at the premisses we identified in setting up the puzzle, there is several that might be revised in order to accommodate endurance without presentism. In particular, we have yet to consider what it is for an object to be a subject of properties (so we could reject or modify the *proper subject condition*), and what sort of properties are instantiated in objects that undergo change (so we could reject or modify the incompatibility condition).

¹³ Although I suggest here that serious tensing involves more than one predication relation, another option would be to postulate one basic predication relation (*being (presently) F*), and introduce past- and future-tense operators.

¹⁴ As I understand the serious tenses approach, the core thesis is metaphysical claim that instantiation is always tensed. It follows from this that propositions stating a tensed claim can change their truth-value as time passes: *the apple is green* becomes false. This, then, is captured by saying that truth or falsity (obtaining–not obtaining) is a tensed matter. Note, however, that one may maintain that propositions are true at some times and not others, i.e. that propositions are not eternally true or false, without being a serious tenses. One may, for example, hold that propositions are true at times in a way analogous to propositions being true at worlds.

Hence, the argument that endurance entails presentism construes the endurantist's options too narrowly.¹⁵

Thus far, it appears that there are presentist and eternalist versions of endurantism:

Presentist endurantism. Only presently existing objects exist; ordinary objects persist by enduring;¹⁶ and

Non-presentist (eternalist) endurantism. Past, present, and future objects all exist; ordinary objects persist by enduring (allowing that there are both enduring, exduring, and perduring particulars).

So far it appears that the existence of enduring things is compatible with both understandings of time. The temporal parts ontology, however, is typically articulated in an eternalist framework. Is such an ontology committed to eternalism? Is it possible to be a presentist and also accept an ontology of temporal parts? Recall the views to consider:

Perdurance theory. Objects persist only by perduring. There are no enduring or exduring particulars.

Stage theory. Ordinary objects persist by exduring.

By venturing a bit further into the details it becomes clear, I believe, that the issues of persistence and presentism cross-cut each other. Let us begin with the stage theory: Is the stage theory compatible with presentism, or is it committed to eternalism? According to presentism, only the present exists. So, if all objects are stages, only present stages exist. But it is possible for a present stage to persist by *exduring* if it has counterpart stages at other times. Rearticulating this in a way compatible with presentism, one could maintain that a present stage persists by virtue of the fact that a (distinct) counterpart stage *will replace* it, or that it *replaced* an earlier (distinct) counterpart stage. On this view, the present (aka what exists) contains a 'flow' of short-lived entities, linked into persisting things through tense-sensitive counterpart relations.

One might object to this view by claiming that existing things cannot bear relations to non-existing things. However, if presentism is to be tenable at all, it must provide an account of statements that appear to assert cross-temporal relations (Markosian forthcoming). Consider:

I am the daughter of Anne and Robert Haslinger.

¹⁵ Merricks (1995) acknowledges that there might appear to be other options open to an endurantist besides opting for presentism, but argues that the other options, e.g. modifying the incompatibility or proper subject conditions, are untenable.

¹⁶ I will discuss below whether perdurantism and exdurantism are compatible with presentism. I argue that they are. If this is correct, then the presentist endurantist can also allow that there are stages and perduring things, but will claim that ordinary things persist by enduring.

(Neither of them (on the presentist's view) exists.) Or more basic to the view:

Yesterday occurred before today.

(Keep in mind that on the presentist's view, yesterday does not exist.) Whether the presentist can provide an interpretation (or an 'underlier'; Sider 1999; cf. Markosian forthcoming) of cross-temporal statements that avoids relations between existing and non-existing things is controversial; however, if such a strategy is available, there is no reason to think it could not handle counterpart relations sufficient for exdurance. In short, if presentism is tenable at all, it has the resources to accommodate exduring things.

But given a way to accommodate exdurance, can a presentist also accommodate perdurance? It depends on how one articulates the notion of perdurance. If to perdure an object must *exist at different times* by having parts at those times, then perdurance is not compatible with presentism. But a presentist could say that a persisting candle consists of the present candle-stage and those stages of it that already *were* and those that *will be*. Although some have claimed that one cannot have as a part something that doesn't exist (Merricks 1995: 524), again, this intuition is biased against the presentist. If a presentist has the resources to account for cross-temporal relations, there does not appear to be any special reason to balk at cross-temporal relations between parts: my maternal grandmother is part of my extended family even though she does not (presently) exist. A presentist should be able to accommodate claims such as this. If so, then there are resources available to the presentist—including, for example, serious tensing—to articulate a version of the perdurance theory.¹⁷

However, it appears to be implicit in some understandings of presentism that things existing in the present are wholly present, and the properties they instantiate are only those they presently instantiate. (Neither of these claims follows from the thesis that only the present and presently existing things exist; but presentism is sometimes construed as a cluster of related theses.) If this is the case, then the perdurance theorist could not maintain that the candle exists (is wholly present in the present) in a way consistent both with its perduring and presentism (Oaklander 1992: 81–2). In any case, all perdurance and exdurance theorists to date prefer to state their positions in a form that favours non-presentism, and there is no reason to think that the presentist version is preferable.¹⁸

In light of the issues just raised, it appears that there is a broader range of accounts than is ordinarily considered; i.e. each of the perdurance, endurance, and exdurance

¹⁷ It may be more plausible to think of events as perduring within a presentist framework than objects; there is some evidence that Chisholm looked favourably on such a view (in correspondence with Dean Zimmerman). See also Simons (2000a).

¹⁸ However, it is instructive to note that the statements of both perdurance and endurance are in a form suited to eternalism rather than presentism, so more will need to be said about a presentist's account of persistence.

accounts can be developed within either a presentist or eternalist account of time. In other words, one's commitment to presentism or eternalism does not force a commitment to a particular account of persistence (though it may constrain how one articulates it). I will return to consider the role of time in competing solutions to the puzzle, but so far I have simply laid out a set of views based on their accounts of *persistence*. I have not yet considered how these accounts accommodate or fail to accommodate the other principles used to generate the original puzzle. For example, I have not discussed in detail how or whether the different views can capture the idea that an object undergoing alteration changes with respect to *its* properties. We should turn, then, to consider whether the other assumptions I started with provide a basis for thinking that ordinary objects perdure, endure, or exdure.

4. METHODOLOGICAL INTERLUDE

But should we move on so easily? It might seem that we should pause at this point in the discussion to consider whether perdurance, endurance, or exdurance provides a plausible account of *persistence*. After all, if it is a 'Moorean' fact that things persist, shouldn't we be sure we have captured this fact and haven't misconstrued what persistence *really is*?

But how should we decide 'what persistence really is'? Should we rely on introspective evidence about our concept of persistence (list the standard platitudes about persistence), with the goal of understanding the ontological commitments of our everyday conceptual scheme (if so, whose conceptual scheme exactly are we interested in, and why)? Should we decide by working out a semantics of tensed discourse (Ludlow 1999), with the goal of understanding the ontological commitments of ordinary language? Or should we aim to determine what sorts of particulars there really are by working out a full metaphysical picture that best accommodates our needs in other areas (philosophy of language, epistemology, physics . . .), and then accept the account of persistence entailed by that picture? Each of these strategies suggests a different understanding of and approach to the problem.

Some have suggested that our ordinary term 'persistence' is indeterminate with respect to the ontological details we've been considering. The idea is that our semantical and analytical intuitions are not sufficient to distinguish among the accounts, so cannot provide a guide to which account is best (Johnston 1987). If this is the case, there are several different options: one might look to empirical science for answers; one might look for a priori considerations beyond reflection on our language or our concepts to settle the matter (Haslanger 1989*b*, 1992). Although there are methodological advantages to viewing the ordinary predicate 'persists' as

ontologically indeterminate, I myself find it much more plausible to think that our ordinary notion of persistence is to be analysed as endurance than either of the alternatives. To suggest that exdurance captures our ordinary notion of persistence strikes me as bizarre; to interpret persistence as perdurance only slightly less so.

But even if our concepts of persistence, change, identity, etc. are better captured by some of the options we've considered than others, the question arises whether the main goal of the project is to provide an *analysis* of our concepts. After all, finding a satisfactory solution to the puzzle may require that we *revise* our concepts. It is certainly possible that a cluster of our everyday concepts commits us to paradox, in which case revision is called for; given the nature of the paradox, one or another plausible claim must be rejected. The question is which one? If the goal is to provide an account on which ordinary things undergo alteration, then what's important is to provide a metaphysical picture on which the claim that objects alter comes out true, or at least close to true. In this spirit, Ted Sider suggests, for example, that the goal ought to be to provide 'underliers', i.e., more specifically, quasi-truthmakers,¹⁹ for our original assumptions rather than 'interpretations' (Sider 1999, esp. 330–3). It may well be that, in the end, what is meant by 'objects alter' is quite different from what we originally imagined when employing our ordinary pre-theoretic concepts. But this in itself is not an objection. It is likely that all the resolutions to the paradox require some revisionary notions, and such revisions can surely be made in the spirit of correction. But then, how do we decide between the options before us? In the end it may be that a number of different options are reasonable, depending on one's other commitments. I will return to these issues and to consider the trade-offs of the various views.

5. RELATIONALISM, INCOMPATIBILITY, AND TEMPORARY INTRINSICS

Where are we now? We have seen that there are several different options for accounting for the persistence of ordinary objects. The main contenders are perdurantism,

¹⁹ Strictly speaking, we are looking not for 'truthmakers' but for 'quasi-truthmakers', since the account provided does not render the original claims—on their intended interpretations—true. Instead, roughly speaking, a sentence is quasi-true if the world is *similar enough* to the way it would have to be for the sentence to be genuinely true' (Sider 1999: 332). More precisely, with respect to the eternalist-presentist debate: 'If there is . . . a "quasi-supervenience base" for a sentence *S*—to a first approximation, a true proposition *P* that would have been true and entailed the truth of *S*, if eternalism were true—then . . . *P* is an *underlying truth* for *S*, and [*i*s] . . . *quasi-true*' (Sider 1999: 332–3).

exdurantism, and endurantism, each of which have, at least in principle, versions compatible with presentism and eternalism. It is not yet clear, however, how an eternalist endurantist can avoid the original puzzle. In other words, how can something be wholly present at different times—times that are equally real—and have incompatible properties?

The law of non-contradiction (3) is considered by all parties to the debate to be non-negotiable. However, another starting assumption is the incompatibility condition:

- (2) *Incompatibility condition.* The properties involved in a change are incompatible.

This assumption appears to be called into question if one combines an endurantist account of persistence with what we'll call the *relational* approach to temporal qualification, namely, the approach that all properties are really relations to times.

Consider the facts that we are trying to accommodate.

- (c) The candle is straight in the morning.
(d) The candle is bent in the afternoon.

Plausibly contradiction will be avoided if we can figure out a way to understand the temporal qualifications 'in the morning' and 'in the afternoon' so that *being straight* and *being bent* are not properties of the object at the same time. 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 8 a.m. is to say that the *being straight at* relation holds between the candle and 8 a.m. Correspondingly, to say that the candle is bent at 5 p.m. is to say that the *being bent at* relation holds between the candle and 5 p.m. (*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.²⁰ Yet because *being straight at t* and *being bent at t'* are compatible, there is a sense too in which the incompatibility condition has been sacrificed. This is meaningful because the incompatibility condition is what seems to capture the fact that change occurs.

A quick answer to this complaint is that we should be more sensitive to what the incompatibility condition requires. One way of thinking about incompatible relations is to take *R* and *R** to be incompatible just in case nothing can stand in both *R* and *R** to the same thing(s). So being shorter than and being taller than are incompatible, not because I cannot be both shorter than Michael Jordan and taller than Spike Lee, but because I cannot be both shorter than Michael Jordan and

taller than Michael Jordan. Even though *being bent at t* and *being straight at t'* are compatible, *being bent at* and *being straight at* are incompatible in the sense that the candle could not stand in both relations to the same time. In other words, it may be that the *relations* in question are incompatible, even if the *relational properties*, i.e. the properties of *being straight at t* and *being bent at t'*, are compatible. The fact of change is captured because the candle cannot stand in both the *straight at* and *bent at* relations unless it persists through a change, represented by its different relations to the different times.

Given these observations, the combination of endurantism, eternalism, and relationalism looks quite appealing: some things are wholly present at different times, and they can undergo change by standing in incompatible relations to different times.²¹

The main objection to this account is that it fails to accommodate the phenomenon of *temporary intrinsics*. In fact, some have argued that temporary intrinsics lie at the heart of the puzzle about persistence through change (Lewis 1988). The intrinsic properties of an object are, roughly, those properties it has by virtue of itself alone, and not by virtue of its relations to other things; they are the properties that any duplicate of the object would have. According to David Lewis, relational changes, e.g. when my son grows to be taller than I am, can be accommodated by viewing them as being relativized to time. For example, although it might seem that in the case in question, *being taller than* is a relation between Isaac and me (I am currently taller than Isaac, but he will no doubt come to be taller than I am), Lewis sees no objection to treating it as a relation between Isaac, me, and a time: Sally is taller than Isaac on 1 August 2001; Sally is shorter than Isaac on 1 August 2009. Paradox is avoided because the relational properties (*being taller than Isaac on 1 August 2001*, *being shorter than Isaac on 1 August 2009*) are compatible. The problem, he maintains, arises if we attempt to account for all change by construing the properties involved as relational. Doing so would eliminate temporary monadic properties, i.e. temporary qualities, or temporary intrinsics, for apparently monadic properties (such as *being bent* or *being straight*) would have to be construed as relations to times.

Why the special concern with temporary intrinsics (Hawley 1998)? It can't be simply the worry that objects should not be 'bare' but must have *some* intrinsic properties, for things might be 'clothed' with permanent intrinsic properties (or even essential intrinsic properties). It can't be that our intuitions about what's monadic are stronger than about what's dyadic (as opposed to triadic etc.), for this isn't plausible: why should the idea that *being bent* is a monadic property of the candle (as opposed to being a dyadic relation between the candle and a time) be more important than the idea that *being taller than* is a dyadic relation between

²⁰ On the exdurant and perdurant accounts, straightness and bentness are attributed to different candle-stages, so each view is consistent with the claim that the properties involved in the change are incompatible. So, in so far as it solves the persistence problem, the 'relationalist' strategy appeals only to endurantists.

²¹ For a helpful discussion of the resources of this view, see Hawley (2001: 16–20). Although Hawley doesn't ultimately defend a relationalist account, she effectively explores its strengths.

Isaac and me (as opposed to a triadic relation between Isaac, me, and a time)? The motivation for focusing on temporary intrinsics seems to be simply that we *do* want to accommodate the phenomenon of intrinsic change, more specifically, to have an understanding of what it is to be a subject of properties that makes intrinsic change possible. Objects have some intrinsic properties: some of their properties are due just to how they are. But, surprisingly perhaps, objects sometimes change in these very respects—in shape, in their internal workings, in how they themselves are. How can we capture this?

One way is Lewis's way: deny that temporary intrinsics are in any way relational. But there are certainly others. The very notion of an 'intrinsic duplicate' needs clarification, and it is an open question whether being monadic is essential to the notion of intrinsic property (Zimmerman 1998a: 207–8; Haslanger 1989a; Lewis 2002: 3–4). Relations to times are exactly the sort of relations that may plausibly count as intrinsic. For example, consider two balls, *b* and *b**, that are intrinsic duplicates. Plausibly intrinsic duplicates can exist at different times, so suppose *b* exists at *t* and *b** exists at *t**. Now suppose *b* and *b** differ in their relational properties, e.g. *b* is red at *t*, but *b** is not red at *t**, or *b* is 3 inches in diameter at *t* but *b** is not 3 inches diameter at *t**. Surely, contrary to our original supposition, we should not count the balls as intrinsic duplicates even if they only vary in the relational ways just indicated; but if the balls must be alike in certain relational respects in order to be intrinsic duplicates, then it is plausible to say that their intrinsic nature is not captured by their monadic properties. Conversely, suppose that no temporary properties are monadic (namely, all temporary properties are relations to times), but *x* and *y* stand in all the same two-placed relations to their respective times (so where one is red at *t*, the other is red at *t'*; where one is 3 inches diameter at *t*, the other is 3 inches diameter at *t'*, etc.). Is it not plausible that they are intrinsic duplicates?

Where, then, do we stand? Is the endurantist relationalist account tenable: can objects endure and change by standing in incompatible relations to different times? It seems yes. First, it is possible to develop an account of intrinsic property and intrinsic change which allows that not all intrinsic properties are monadic; so a relationalist could accommodate temporary intrinsics by claiming that when an object is bent at *t* and straight at *t'*, it undergoes intrinsic change. Secondly, if one is uncomfortable toying with the notion of intrinsicness, the fact remains that there is nothing irrational in denying the phenomenon of intrinsic change and maintaining that all alteration is relational. An account that allows us to capture intrinsic change would be attractive, but we've seen no argument that giving up intrinsic change would be a disaster. Thirdly, in accepting a relational view it might appear that one compromises the assumption that change involves incompatible properties (that the properties *being bent at t* and *being straight at t'* are compatible is crucial to avoiding the puzzle), but there is a sense in which the relations in question are incompatible. So the relationalist account fares quite well so far.

One might reasonably ask, however, in what sense does the relationalist account really capture *change*? Does the fact that I am both taller than my son and shorter than my father indicate any sense in which I've changed? Surely not. How, then, does standing in incompatible relations to two different times capture change? I will return to this question below when we consider the 'no change' objection to the perdurance view.

6. PERDURANCE, PROPER SUBJECTS, AND CHANGE

I mentioned above that we would have to return to the question whether the perdurance account of persistence provided the resources to capture the notion of alteration, or whether perdurantists simply replace alteration with succession. With the problem of temporary intrinsics now before us we can ask more pointedly, does the perdurance account itself adequately capture intrinsic change?

After the persistence condition, the most controversial and difficult assumption in the puzzle is what we've been calling the *proper subject condition*, namely,

- (5) *Proper subject condition.* The object undergoing the change is itself the proper subject of the properties involved in the change; for example, the persisting candle is itself the proper subject of the incompatible properties.

If the heart of the puzzle is in the phenomenon of temporary intrinsics, the proper subject condition is where the heart is truly exposed. Change is interesting in its own right and we have reason to look for an account that preserves some form of persistence, but problems about change have been central to metaphysics for millennia because they focus us on questions about predication and instantiation: What is it for an object to have a property? Especially: What is it to have an intrinsic property? And if a property is intrinsic, how can an object lose it (or gain it)?

It is a disadvantage of the perdurance account that it sacrifices the proper subject condition. How? Consider again the candle's change from straight to bent. On the perdurance view, the proper subject of straightness is the early candle-stage; the proper subject of bentness is the later candle-stage. The candle composed of these parts is not strictly speaking both straight and bent (otherwise we would be left again with a contradiction), but is only indirectly or derivatively straight and bent by virtue of having parts that are. Thus, the perdurantist tells us that the candle (namely, the candle-worm) is itself never the proper subject of *being bent* or *being straight*. The endurantist has no reason to make such a strange claim.

Note further that the perdurantist who stresses the importance of temporary intrinsics is in a somewhat awkward position, for by sacrificing the proper subject condition, we seem to get the wrong subjects for the intrinsic properties. Lewis emphasizes that *bentness* and *straightness* are intrinsic properties. That seems plausible. But what seems plausible is that they are intrinsic properties of ordinary objects such as candles and railroad tracks and persons. To capture this intuition by saying that *bentness* and *straightness* are properly speaking intrinsic properties of candle-stages, railroad-track-stages, and person-stages, and are derivatively intrinsic properties of candles, railroad tracks, and persons (by being intrinsic properties of their parts), compromises the insight we were aiming for (Haslanger 1989a: 119–20; Zimmerman 1998a: 215). This may seem too subtle for serious consideration. But it was Lewis—the arch-perdurantist—after all, who emphasized the issue of intrinsicness, so asking the perdurantist to pay attention to what counts as the proper subject of an intrinsic property is only fair.

However, are the benefits of the perdurance account so powerful that they outweigh concerns about whether it fully satisfies the proper subject condition? One can find a variety of objections to the metaphysics of temporal parts underlying the perdurance theory. For example, some have argued that the notion of temporal part is not intelligible (van Inwagen 1990, 2000); others have objected to the mereological assumptions seeming to underlie it (Thomson 1983; van Inwagen 1981); others have complained of its over-abundant ontology of momentary particulars popping into and out of existence (Thomson 1983); others have argued that it renders change inexplicable (Haslanger 1989a); others have suggested it cannot adequately account for motion (consider the rotating disk objections; Kripke 1978; Armstrong 1980; Zimmerman 1998b, 1999; Lewis 1999; Hawley 1999; Callender 2001); still others have argued that it is unmotivated (Rea 1998). However, the objection especially relevant to the problem of change we're considering is the 'no change' objection (McTaggart 1927, ch. 33; Lombard 1986: 108–9; Simons 1987: 34–7, 126; Mellor 1981: 110–11; Heller 1992).

There are two versions of the 'no change' objection, both of which assume an eternalist version of perdurantism.²² According to the first version, the perdurance view is allegedly committed to a 'static' conception of time: time and all its occupants are stretched out 'timelessly' in four dimensions; stages, like dots in a pointillist painting, can bear the right sort of relations to each other to count as a persisting object, but nothing really moves; nothing even comes into or goes out of existence. Everything is just *there*. On the second version—we might call it the 'no alteration' objection to distinguish it from the first—stages are thought to come into and go out of existence instantaneously in succession. So it is granted that there is change

(indeed, almost nothing but), but because there is nothing that gains or loses one of *its* properties, there is no genuine alteration. The stages come and go, but do not alter; the persisting thing has different parts with different properties, but it too does not alter. So persistence (as perdurance) through time may be achieved, but genuine alteration is denied.

The perdurance theorist responds to both versions of the objection in the same way: although the perdurance account may not be adequate to capture every construal of what change or alteration involves, it does justice to the phenomena that must be accommodated. Any account of change must do justice to the facts we've already considered:

- (c) The candle is straight in the morning.
- (d) The candle is bent in the afternoon.

These facts are accommodated by the perdurantist's paraphrases or reconstructions:

- (c*) The candle has as a part a morning-stage (or morning segment) that is straight.
- (d*) The candle has as a part an afternoon-stage (or afternoon segment) that is bent.

Although both (c*) and (d*) are eternally true, this does not undermine the claim that change has occurred, for, the perdurantist maintains, change occurs when an object's temporal parts have incompatible properties. Nor do (c*) and (d*) undermine the claim that alteration is possible, for alteration can be understood simply as variation in the intrinsic qualities of a thing. According to the perdurantist, having a straight-stage and a bent-stage is our best account of such variation: bentness and straightness are incompatible intrinsic properties of the stages that are parts of the persisting thing.

Although I've sketched the 'no change' objection in response to the perdurance theory, there are versions of it that can arise for other eternalist accounts, including endurantist and exdurantist accounts. (Note in particular that I ended the previous section with a version of the 'no change' objection against the eternalist relationalist.) Because eternalism allows for a 'timeless' representation of the world, it is in danger of seeming entirely static. Admittedly, change may not appear familiar to us when considered from a timeless perspective, and yet we may be describing change nonetheless; after all, our experience of change is in time. In short, eternalists can allow that their models do not fully capture the phenomenology of change, but also maintain that they do capture the ontology underlying the phenomenology. So the 'no change' objection, by itself, does not force us to abandon the eternalist accounts of persistence.

Summarizing where we stand with the perdurance view: How can an object persist through change with respect to the way it is by virtue of itself alone? The perdurantist answers: it has parts with incompatible properties. What is

²² The 'no change' challenge (in somewhat different forms) is one that arises not only for eternalist perdurantism, but for any eternalist view. We'll see that the perdurantist's strategy for response is parallel to ones available to other endurantists as well.

the relation between the persisting object and the properties involved in such a change? The perdurantist answers: the persisting thing's relation to the properties is mediated by the parts which have them intrinsically, but a property intrinsic to the parts is intrinsic to the whole. So thus far it appears we have a couple of different options available for thinking about alteration: the perdurance theory (persisting things perdure with intrinsically different parts), and relationalism (persisting things endure and stand in incompatible (intrinsic) relations to different times). Stage theory and presentism remain on the table for further consideration: how do they fare with respect to the set of original principles? Are they viable options?

7. STAGE THEORY AND LASTING INTRINSICS

Note that the exdurance or stage view has many of the same benefits as the perdurance account, without some of its disadvantages. Remember, on the stage view, ordinary objects are stages that persist by *exduring*, i.e. by standing in counterpart relations to distinct stages at other times. As on the perdurance account, the stage view provides a simple way to avoid the predication of incompatible properties in cases of change: the subjects of the incompatible properties (different stages at different times) are distinct, so no contradiction arises. It also accommodates temporary intrinsics: intrinsic properties are instantiated in exduring objects (which are stages); the candle's *being bent* or *being straight* is not construed relationally (it is neither a relation to times, nor a relation to parts that have the intrinsics, as in Lewis's story). Moreover, the stage theory appeals to certain ontological minimalists by not needing to postulate sums of stages over and above the stages themselves. (For further advantages, see Hawley 2001; Sider 2001.)

Note, however, that the stage view does not appear to accommodate *history-dependent* intrinsics. If it is reasonable to insist that an adequate account of alteration do justice to temporary intrinsics, such as *being bent*, then it would seem that it should also do justice to history-dependent intrinsics such as being a horse or being a chair. Plausibly horses and chairs are horses and chairs not simply by virtue of their occurrent properties, but by virtue also of properties they have had and/or will have. In other words, something's currently being a horse is an intrinsic property that depends on how *it* is at other times. But on the exdurance account, strictly speaking there is no way that *it* (the stage) is at other times. *It* is some way or another at other times by virtue of counterparts at those times. So *its* being a horse is not intrinsic (to its proper subject, namely, the stage), but depends on how other things are. Having seen that there are numerous ways to rethink the notion of intrinsicness, there are

no doubt ways for the exdurantist to respond. But the response will require some trade-off in our intuitions.

Moreover, the stage theory appears to reject the identity condition (4) outright. The identity condition requires that 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. The stage theory asserts that objects persist without *themselves* being present (either wholly or partly) at different times; objects are short-lived and persist by having *counterparts* at different times.

As one might expect, there is a (by now familiar) strategy of response at hand. The idea is that statements expressing persistence facts must be systematically reconstructed. Although it is true to say that the candle that is straight in the morning is one and the same candle as the candle that is straight in the afternoon, the 'underlier' for this statement, what makes the statement true, is not an identity between the morning candle and the evening candle, but the fact that a certain counterpart relation holds between them. So at the level of ordinary speech the identity condition is preserved, even if at the ontological level the identity condition is violated. (This general strategy can be used to respond both to the problem of history-dependent intrinsics and to the alleged violation of the identity condition.)

To my mind, however, this strategy strains the limits of credibility. Nonetheless, it highlights a broader methodological question that has cropped up repeatedly in evaluating the various solutions to the puzzle. In articulating the original assumptions that gave rise to the puzzle, how philosophically laden, how ontologically committal, were the claims? Is our goal in solving the puzzle to provide 'analyses' of the key concepts, e.g. of persistence, change, property, etc. which demonstrate that the given set of claims employing these concepts are compatible? Or is our goal not to provide 'analyses', but 'underliers'—accounts of the underlying facts that make the claims true or 'quasi-true', but which don't in any traditional sense capture the 'meaning' of the original claims? If we are seeking 'analyses', then it isn't at all clear that our ordinary intuitions provide enough data to discriminate between the various options. But if we are seeking 'underliers', it isn't clear what is constraining our choice of interpretations. If an ontology on which nothing exists for any substantial length of time can be construed as satisfying the identity condition on persistence, namely, that things persist by continuing to exist through time, then it is hard to see how the identity condition has constrained our ontology at all.

A more appealing approach to the puzzle, I believe, is to interpret the initial assumptions as articulating considered judgements concerning ontology, and as employing at least some terms whose interpretation the various parties to the debate agree upon. Which terms they will be cannot be decided by fiat in advance, but must be decided as the debate unfolds. If we proceed in this way, I think at this stage we should agree to disagree about the term 'persistence', but agree to agree about the term 'identity'. If so, then the stage theory maintains that there is persistence without identity over time, and the other parties to the debate (both the perdurance and

endurance theorists) maintain that persistence requires identity—either identity of the worm or of the subject of change. So, rather than saying that the exdurant account is compatible with the identity condition, the debate is better served by saying that the exdurantists bite the bullet and reject the identity condition. This, however, need not be fatal to the exdurantist if the main goal is to preserve persistence, for persistence is, at least in one sense, preserved.

8. PRESENTISM AND 'JUST HAVING' A PROPERTY

We have just considered three eternalist approaches in detail: relationalism, perdurantism, and exdurantism. But are there grounds for thinking that presentism offers a better alternative? If we make it a priority to preserve the *proper subject condition*, then some would maintain that our best candidate is a presentist approach, for the presentist's emphasis is certainly on capturing how, for example, an enduring object that *was straight* can *be bent*. But even more promising, the presentist endurance solution seems to provide a model on which the five conditions can be jointly satisfied (see Hinchliff 1996; Zimmerman 1996, 1998a). Although, as we saw above, the issue of presentism cross-cuts persistence (one can be a presentist and, with adjustments, maintain any of the views on persistence), presentism is especially appealing to endurantists who are unhappy with a relationalist account.²³

Recall that the presentist maintains that only the present exists or is real. Combining this ontology with a serious approach to tense, the following view emerges. We satisfy the persistence condition and identity condition by allowing that the candle endures: it *is* wholly present now, it *was* wholly present before (and presumably *will be* later). Moreover, we make sense of the idea that the candle is the proper subject of the properties involved in the change by attending to tense: it (the candle itself) *was* straight, but that very candle *is* also bent. Further, the properties of being straight and bent are not relational: following terminology offered by Mark Hinchliff (1996), the properties are ones that the candle can *just have* (in other terms, the properties *being straight* and *being bent* are ones the candle has *simpliciter*). The candle *just is* straight, and then it *just is* bent. The properties of *bentness* and *straightness* are incompatible properties (nothing can *just have* both), as required by the incompatibility condition. And finally, we avoid contradiction by noting that the only

²³ As indicated above, the perdurantist and exdurantist have other ways of avoiding the puzzle, so they don't need presentism to do the work of providing a solution. They may choose to be presentists on other grounds, however.

property the candle has *simpliciter* are the properties it presently has; even though it *had* the property of being straight, this does not conflict with its *just having* the property of being bent. (See also Craig 1998.)

Of course, all parties to the debate want to account for the possibility of genuine alteration by providing an account of temporal qualification. Because we need not be presentists to take tense seriously, we need to say more to clarify what is distinctive of the presentist's approach (Rea, Chapter 9 in this volume; Bigelow 1996). Let's consider two claims we want to make about the candle:

- (e) The candle is bent.
- (f) The candle was straight.

On the presentist's view, (e) expresses a primitive predication between the candle and the property of being bent. This primitive predication, which I have referred to as 'just having' or 'having *simpliciter*', is paradigmatically instantiated by an object and a property in the present. We must be clear, though, that the presentist does not define 'just having' as 'having now' or 'presently having'; it is a substantive metaphysical thesis that objects 'just have' the properties they have in the present. So we should understand (e) as:

- (e*) The candle *just has* bentness.

In contrast, (f), by virtue of the tense, can be understood by applying the tense operator 'it was the case that' to the primitive predication holding between the candle and straightness:

- (f*) It was the case that the candle *just has* straightness.

So, although it is not the case that the candle *is* straight, it *was* straight; it does not *just have* straightness, but it *just had* straightness.²⁴

So far the approach addresses the problem of alteration by taking tense seriously, i.e. by treating the predicative elements in propositions as tensed rather than tenseless. Where does presentism fit in? How are these views about our tensed discourse related to the ontological commitments of presentism? As we've seen, according to the serious tensor, facts about how things 'are' are facts about the way they are, were, or will be. But one need not be a presentist to accept this view. An eternalist can maintain that there are wholly past things (Socrates) and wholly future things (my first grandchild) but any proposition concerning these things is temporally moored

²⁴ The fact that an object *just has* a property is not a fact that obtains eternally: some candles 'just have' straightness, but will fail to 'just have' straightness later. But there is no contradiction here, since the properties an object has and the properties the object will have may be incompatible. Note also that some may prefer to articulate the presentist position as committed to only one instantiation relation ('just having') and to accommodate past and future tense by operators: it was the case that *x* just has *P*; it will be the case that *x* just has *P*.

in the present.²⁵ For example, it is compatible with serious tensing that Socrates exists and stands in backward-looking relations to his past properties, e.g. Socrates has the property of *having been wise*, of *having been a social 'gadfly'*, of *having been executed*. But once we have the resources of serious tensing, these seem sufficient to address the problem of change, and the presentist ontology is not needed. In other words, on the strategy just outlined, it is the serious tensor's metaphysical commitment to tensed propositions that allows us to evade the contradiction, not the presentist ontology. We can say that there are ways the object *was* other than (and incompatible with) the way it *is*, but that's because *having had* a property is not the same as *just having it*.

So where do we stand? If we are drawn to endurantism but want to resist relationalism, then serious tensing seems to be a promising strategy to avoid the original puzzle. Serious tensing is compatible, at least in principle, with either presentism or eternalism, so one need not endorse presentism to pursue this strategy. This may come as a relief, for as we saw above for the perdurance view, there are a wide range of arguments against presentism that have nothing to do with change or alteration. (We've glimpsed before questions about the presentist's ability to handle cross-temporal relations and singular propositions about the past; there are others (Markosian forthcoming). These don't arise for the eternalist serious tensor.)

However, Zimmerman has argued that the combination of eternalism (some things exist that don't presently exist) and serious tensing is not an appealing position (Zimmerman 1998a). He argues: Consider my past headache. Suppose, with the eternalist, that it exists but does not presently exist.²⁶ Given serious tensing, we cannot say that it *is* painful, for that would mean that it is presently painful, and by hypothesis, it isn't (though it *was* painful). But doesn't this leave us with a rather ghostly non-painful headache? In fact on this view, all wholly past entities exist, but the only properties they *have* (read as tensed) are mere reflections of their past lives (e.g. they aren't in space but were in space; aren't shaped but were shaped; etc.). Although this is not an incoherent position (Smith 1993), its drawbacks have led most serious tensors to opt for presentism.

So what about the combination of presentism and serious tensing? Is it an appealing option? Setting aside complaints against presentism that stem from considerations outside of the debate over alteration, are there arguments against

²⁵ Here's another way to put the idea: it is possible to hold the view that quantifiers range over things existing at all times, and also that anything asserted of the things in the domain of the quantifier expresses a tensed fact.

²⁶ It is something of a question what sense to give the claim that the past headache exists. Is this to be understood as an untensed 'exists'? If so, then this seems incompatible with a serious tensor who rejects untensed predicates (though perhaps there are serious tensors who aren't *really* serious and allow that there are both tensed and untensed facts). Alternatively it could mean that the headache either existed, exists, or will exist, but if this is the right interpretation, then it isn't clear the headache is a 'ghostly' existing entity as suggested below.

its proposed analysis of change? There are places where David Lewis seems to suggest the following argument: Persistence requires that things be wholly present at different times. But on the presentist view, strictly speaking, there is only one time (the present). So the presentist cannot accommodate persistence.

If this is the argument, then Lewis's conception of persistence seems to beg the question against the presentist. For example, Lewis maintains that if I persist, then (as Zimmerman articulates it):

(PC) There are at least two different times; one at which I am bent, the other at which I'm straight. (Zimmerman 1998: 213)

Zimmerman argues that we can get the force of this on a presentist view, without the eternalist ontological commitment (Zimmerman 1998a: 212–16). He offers the following paraphrase:

(Z) Either I was bent and would become or had previously been straight; or I will be bent and will have been or be about to become straight, or I will be straight and will have been or be about to become bent. (Zimmerman 1998a: 215)

In short, the persistence of an entity does not require that more than one time exists, but only that other times *did exist* or *will exist* at which the entity *was* or *will be* wholly present. And this seems right.

However, there may be more to the objection. Lewis has also argued:

[According to the presentist, non-present times] are like fake stories; they are abstract representations, composed out of the materials of the present, which represent or misrepresent the way things are. When something has different intrinsic properties according to one of these ersatz other times, that does not mean that it, or any part of it, or anything else, just has them—no more so than when a man is crooked according to the *Times*, or honest according to the *News*. This is a solution that rejects endurance because it rejects persistence altogether. (Lewis 1986: 204; see also Lewis 2002: 2)

What is the argument here? Here's one interpretation: Suppose that the candle is now bent but was straight. If the presentist says,

(g) In the past, the candle is straight.

The embedded claim that the candle is straight is false, but it is allegedly 'made true' by adding the modifier 'In the past'. But Lewis asks, how does adding the modifier 'In the past' allow us to capture a truth? According to the presentist there is no straight candle—only presently existing things exist, and the candle now before us is bent. In short, there is no (existing) past by reference to which the claim (g) is true. Instead, (g) must be made true by a 'fake story'. So, he claims, the presentist does not provide us with the resources to capture persistence.

But again this argument seems to beg the question against the presentist. Lewis's idea seems to be that propositions must be evaluated as true or false within an eternalist framework: the facts are laid out timelessly and propositions are true iff they correspond to one of the (timeless) facts. But, as we've seen, this is not a model

the presentist would or need endorse. The candle that was straight presently exists (but is bent now); the fact that the candle *was* straight is a present (past-tensed) fact about it and (g) is true in virtue of that present fact. It appears, then, that presentism offers an option to the endurantist.

If one insists on certain eternalist frameworks for understanding persistence, time, and tense, then the presentist alternative looks doomed. However, so far we haven't found compelling reasons to favour one background framework above all others. At moments it appears that the conversation is on the verge of breaking down because different parties to the debate are working with such different accounts of time and tense. However, rather than be discouraged by this, one might find the discussion is enriched by tracing the roots of the controversy over change to other metaphysical debates. The challenge, however, is to keep track of the various elements of the discussion and their relation to each other. At issue so far have been:

Time. Does only the present exist? (eternalism v. presentism)

Tense. Are there (primitively) tensed facts? (serious tensing v. non-serious tensing) If so, are all facts tensed, or only some? Semantic: Are grammatical tense and temporal indexicals eliminable, or do ordinary statements have an essential temporal indexical element? (Perry 1979)

Propositions. Do propositions change in their truth-value over time?

Persistence. What is required for persistence? (perdurance, endurance, exdurance)

Existence. What is it to exist 'at a time'? Are particulars 'wholly present' at different times in the same way that universals are 'wholly present' at different places?

Change. What constitutes genuine alteration? Is there genuine alteration (or only succession)? Is there really change in an eternalist framework?

Intrinsicness. Are all intrinsic properties monadic? Are some relations intrinsic to one of the relata?

Properties. Are all temporary properties 'disguised' relations to times? What are the proper subjects of non-occurrent (or lasting) properties?

Predication. What is the relation between an object and its properties? Is predication timeless or tensed? Are there several predication relations or one? (And we're about to consider: Can we temporally modify predication, and if so how? Is predication a relation involving time or non-relational?)

It may seem that there are already enough approaches on the table and we don't need to explore any others. But there is still a set of endurantist views worth considering.

9. ENDURANCE: TEMPORALLY QUALIFIED INSTANTIATION?

Some endurantists are uncomfortable with a presentist ontology: they want to allow that times other than the present and things other than presently existing things exist. Among these, some are also uncomfortable with a relationalist account of temporal qualification. Initially the view that temporary properties are really relations to times was seen as sub-optimal because it appears to reject the premiss in our original puzzle which requires that the properties involved in the change be incompatible (though we considered strategies to reconstrue incompatibility). More importantly, it does not appear to be the best account of temporary *intrinsic*s (though it can do fine if we allow that not all intrinsic are monadic). Are there still more options for an eternalist endurantist?

Many endurantists have toyed with the thought that an object's having a property at a time should be explicated so that it is *the object's having of the property* that is temporally qualified. Three strategies for spelling this out have emerged: copula-tensing, adverbialism, and what I'll call *SOFism*, (for 'state-of-'fairs-ism').

9.1 Copula-Tensing

According to the copula-tenser, objects *have* properties, and the *having* is open to temporal qualification: the candle *has* straightness *at t* and not *at t**. In other words, instantiation is taken to be a separable relation holding between an object, a property, and a time. This view avoids the claim that the properties involved in the change are relations; it can also say that they are incompatible (an object cannot *have* bentness *at* and *have* straightness *at* the same time). Contradiction is avoided by claiming that the candle is not straight and bent *simpliciter*, but *is-at-t* straight and *is-at-t** bent.

The standard response to this approach is that treating the copula as a separable relation lands one in Bradley's regress (Bradley 1897, ch. 3; Armstrong 1978: 106 ff.): if 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. (Lewis 2002: 6–7). One response to this argument would be to suggest that the copula is *not* like other properties or relations and is uniquely able to bind (other) properties or relations to their subject(s); but such moves are not entirely appealing (Lewis 2002: 7, 10–11).

9.2 Adverbialism

The adverbialist solution attempts to sidestep the Bradley regress, while still capturing the insight that the object's *having* the property is what should be temporally modified. The question is how to avoid ontological commitment to the copula as a relation distinct from the instantiated property (Johnston 1987). The idea is that having a property—understanding 'having' as some sort of 'non-relational tie'—is something that can be temporary, and this temporary 'attachment' should be understood by analogy with other adverbial modifiers. For example, the following claims are consistent:

(h) The candle is actually straight.

and

(i) The candle is possibly bent.

Of course, there are different ways to construe (h) and (i), but on one construal, the adverbs 'actually' and 'possibly' are modifying the way in which the candle is straight and bent respectively. Returning to the temporal case, we might construe:

(c) The candle is straight in the morning

as

(c_{adv}) The candle is *in-the-morningly* straight.

The adverbialist avoids contradiction as long as we are precluded from dropping the adverbial qualifications, for (c_{rmadv}) is compatible with

(d_{adv}) The candle is *in-the-afternoonly* bent.

Unquestionably, this option is difficult to state elegantly, but the objective is clear enough. But will it do as a solution to the persistence puzzle? The candle persists, and changes by having—in temporally distinct 'ways'—incompatible properties. There may be some awkwardness in claiming that the object can, in some sense, have incompatible properties (Merricks 1994: 169), but the adverbialist maintains that inconsistency arises only when an object has incompatible properties *in the same way* (temporally speaking). And this makes sense. So the adverbialist is not really in danger of forfeiting the principle of non-contradiction; rather, we must simply restate the principle so that it makes explicit qualification to ways of having properties.

9.3 SOFism

Another strategy for articulating the idea that it is the having of properties that should be temporally qualified develops the idea that *what is the case* depends on

the time under consideration (Forbes 1987; Haslanger 1989a; Lowe 1988; Myro 1986). Graeme Forbes has offered an account along these lines employing states of affairs. Drawing on some of Forbes's suggestions, let us distinguish type and token states of affairs. A type state of affairs consists of a relation between an object and a property:²⁷ *x's being P*. A token state of affairs consists of such a type obtaining at a time: *x's being P obtaining at t*.²⁸ To say that the candle is bent in the afternoon is to say that the (type) state of affairs *the candle's being bent* obtains in the afternoon, or in other words, the type has a token instance: *the candle's being bent in the afternoon*.²⁹

As it stands it isn't entirely clear how to interpret the view just sketched.³⁰ One way of fleshing it out, let's call this strategy *SOFism*, can again be usefully compared to an approach to modal discourse (e.g. Lewis 1986). For example, suppose that the candle in question is actually yellow. It might, however, have been blue. The (type) state of affairs *the candle's being blue* does not actually obtain, but possibly obtains, i.e. it does not obtain in the actual world but obtains in another possible world.³¹ The candle's being (actually) yellow and the candle's being (possibly) blue are incompatible, but do not conflict, because the instantiations of the (type) states of affairs occur in different worlds. Likewise the candle's being (in the morning)

²⁷ For ease of exposition I'll speak of an object and a property, allowing that a more complete exposition would have to include relations as well.

²⁸ As noted above, it is open to an eternalist to opt for serious tensing. Rather than go through every possible option here (in a discussion that is already too complicated), I will focus on the non-serious tensor option, allowing that a serious tensor option could be articulated.

²⁹ A further question is what sense to make of the contrast between type and token states of affairs. Adopting a trope theory would be one option: token states of affairs consist of an object and a trope (Simons 2000b). Then we could understand (iii) as true just in case the candle and the straightness trope (the instantiation of straightness in the candle) constitute a token state of affairs in the morning. Some states of affairs types have no tokens at all; others have tokens but only at some times. But is the introduction of tropes extraneous? Could we simplify the picture by maintaining instead that each time consists of a collection of states of affairs, and to say that a state of affairs *S* obtains at some time *t* is to say that *S* is in the *t* collection? (Is this the ontological pay-off of what Merricks is really getting at in Merricks 1994?)

³⁰ Note that in my 'Endurance and Temporary Intrinsic' (Haslanger 1989a) I didn't defend the view that Hinchliff ascribes to me (Hinchliff 1996: 122). He suggests I opted for a temporalist account on which propositions are true at times (and not eternally); but in the same paragraph (1996: 121) I specifically suggest the eternalist option. Although my prose is far less clear than I would like, on the following page I attempt to descend semantically to speak of an object's instantiation of a property, holding at a time. My concern here was argue that the instantiation of the property by the object was not problematically relational, so I was less clear on the relation between that instantiation and the time. But I think the best way to construe what I was getting at would be to opt for complex eternalist propositions whose semantic values are much like what Forbes suggests.

³¹ In the modal case, modal realists believe that possible worlds other than the actual world are real; modal actualists believe that only the actual world is real. In the temporal analogue, eternalists believe that times other than the present are real; presentists believe that only the present is real. The actualist and presentist typically offer fictionalist or constructivist accounts of non-actual–non-present times. Fortunately for the eternalist, the existence of non-present times is usually taken to be more plausible than the existence of non-actual worlds.

straight and the candle's being (in the afternoon) bent do not conflict because the instantiations of the (type) states of affairs occur at different times.

If SOFism continues to borrow from Lewis's modal example (Lewis 1986: 5–6), tense would be explicated (though not necessarily eliminated) using quantification. For example,

The candle was straight iff there is a past time t , such that at t the candle is straight.

Or in other words: iff there is a past time t such that at t the (type) state of affairs *the candle's being straight* obtains. The phrase 'at t ' serves on this view to restrict names or quantifiers within its scope to the time in question. In ordinary present-tense claims such as 'The candle is straight' the domain³² is restricted to the actual present. More complex statements must be treated with care. For example, Lewis (1986: 6) in

Nowadays there are rulers more dangerous than any ancient Roman.

The 'nowadays' restricts the domain of the quantifier 'there are rulers' to within a few decades of the present, but it cannot plausibly be taken to so restrict the quantifier in 'any ancient Roman'. So more needs to be said in a full analysis to address such cases. However, an advantage of an account using restricted quantifiers is that it provides resources for understanding the various types of temporal qualification we regularly employ (e.g. 'nowadays', 'when I was young'...) beyond standard tenses.

Although suggestive, this strategy won't exactly work for a SOFist exploring endurance options, for in restricting quantifiers to a particular domain, one isn't necessarily restricting them to a particular time. For example, suppose again that the candle endures, is straight at t , and bent at t' . If 'at t' ' restricts the description 'The candle' to the domain of things existing at t , and the candle endures to t' , then we have not avoided contradiction: the candle (which is in the domain of things at both t and at t') would be both bent and straight.

Instead what we need is a way to understand the temporal qualification 'at t' ' as restricting the context for the claim rather than the domain of the names, quantifiers (etc.). There are a number of ways one might accomplish this, but it is illuminating to consider what Barwise and Etchemendy call an 'Austinian' approach to propositions. They say:

According to Austin, a legitimate statement provides two things: a historical (or actual) situation s_A , and a type of situation T_A . The former is just some limited portion of the real world; the speaker refers to it using what Austin calls 'demonstrative conventions.' The latter is, roughly speaking, a property of situations determined from the statement by means of 'descriptive conventions' associated with the language. The statement A is true if s_A is of type T_A ; otherwise it is false. (Barwise and Etchemendy 1987: 28–9)

³² Taking 'the domain' in this context to be the domain of the quantifier in the analysis of the definite description 'the candle'.

They go on to suggest that the 'Austinian proposition' expressed by A is the claim that s_A is of type T_A (Austin 1950). So, on this view, every proposition is about a situation, and says of the situation that it is of a certain type. We determine what situation a statement is about by some combination of explicit and contextual cues.

How does this idea help us think about persistence through change? There are a number of ways to flesh this out, but one way is to maintain that both lexical and pragmatic cues function as 'demonstrative factors' that temporally restrict what situations a particular statement is about. So, for example, when I speak in the morning and say, 'The candle is straight', tense, together with contextual cues, indicate that I am speaking about a concrete situation in the present, and the 'descriptive factors' determine that I am saying of this situation that it is of the type *the candle's being straight*. When I speak in the afternoon and say, 'The candle is bent', I am saying of the concrete situation (then) that it is of the type *the candle's being bent*. I might also say then that 'The candle was straight'. If so, then again various cues indicate that I am speaking of a different (past) situation which is of the type *the candle's being straight*. There is no contradiction here. The type situations are incompatible (they cannot obtain at the same time), but there is no conflict in saying of distinct situations that they are of incompatible types. Although in drawing on the Austinian framework I've switched from talk of type-token states of affairs to type-token situations, for our purposes here the terminology can function as interchangeable.³³

On this view, the statement 'The candle is straight' may appear to change in its truth-value as the candle bends, but the proposition expressed by a given utterance: that s_A is of type T_A does not change its truth-value.³⁴ This in itself raises a number of difficult issues; for example, how does this proposition's truth-value depend on the world at all? How are the indexical elements, including tense, to be treated? How do we account for propositions about non-real situations? (See Barwise and Etchemendy 1987: 129–30.) These are important issues, but they extend beyond the scope of this chapter. For the time being we will have to work with this sketch of only part of the view. (For further details, see e.g. Barwise and Etchemendy 1987; Barwise and Perry 1983.)

To summarize, then, the SOFist account of change seems to be this: There are enduring things wholly present in token states of affairs obtaining at different times

³³ On the Barwise and Etchemendy account, situations are sets of states of affairs (Barwise and Etchemendy 1987: 75, 123). Similarly in Barwise and Perry (1983). This terminological distinction is useful, but for our limited purposes here it is not essential to make the distinction.

³⁴ In my earlier essay (Haslanger 1989a) I pointed to an account along the lines I am suggesting here. However, there I suggested that on such a view propositions would obtain at times (and so change their truth-values). That suggestion has been criticized (e.g. Lewis 2002: 11–12), but, as I am indicating here, one can pursue the strategy without claiming that propositions vary in their truth-values over time. I see myself here as attempting to articulate the approach more fully and with a greater sensitivity to the many background issues. However, there is still much work to be done to sort out the view and its implications.

(endurantism); in states of affairs such as the candle's being straight and the candle's being bent, the properties *being straight* and *being bent* are qualities of the candle (not relations to times); and these properties are incompatible. There is no contradiction because the two states of affairs types involving incompatible properties (*the candle's being bent* and *the candle's being straight*) don't have tokens at the same time. This would seem to be an option that preserves many of our original intuitions: an object can endure through a change in its intrinsic properties.³⁵

SOFism differs from the accounts I've so far considered by suggesting that the principal job of an ordinary subject–predicate sentence is not to express a primitive predication between an object and a property (either a temporally relativized predication, or a predication corresponding to the presentists (or perdurantists) *just having* or *having simpliciter*). Instead, it takes an ordinary statement to be making a claim about a state of affairs type obtaining, or alternatively about a token state of affairs being of a certain type.

Note, however, that there are potentially two predicational elements in this picture: first, whatever is going on between *x* and *P* such that they constitute a type state of affairs, and secondly, the realization of that type in the token. The relation between *x* and *P* in the type state of affairs is not temporally qualified; this is as close as one gets in the SOFist picture to 'just having' or *having simpliciter*. Yet the SOFist also maintains that an object's having a property (*x's being F*) is the sort of thing that—at least for some range of objects and some range of properties—occurs at times. So there also appears to be a temporally relativized element *obtaining at t* in the picture. Note, however, that what happens *at t* is that the type has a token; this is not a relation holding between the object undergoing change and its properties. So even if there may be reason to worry about temporally relativizing the copula (or making all temporary properties relations to times), these worries need not arise here.

10. HAVING A PROPERTY SIMPLICITER

Interestingly, perdurantists and presentists lodge the same complaint against those who seek to temporally qualify instantiation, whether adverbially or as qualifying

³⁵ Admittedly, Lewis argues that we should reject identity across possible worlds and opt for counterparts instead; he offers an analogue of this argument in defence of his perdurantism. However, many have rejected his argument against identity across possible worlds and take identity across time and across worlds to be the more crucial notions to preserve. In any case, the parallel to Lewis's view of modality ends before his commitment to counterparts.

states of affairs: temporary intrinsics are not had *simpliciter*; there is a gap, a mediation, a problematic externality between the object and its properties. Hinchliff argues, for example, that all the relativized instantiation views are, contrary to what I asserted at the end of the previous section, just versions of the relational solution, and so fail to show how objects undergo intrinsic change (Hinchliff 1996); Lewis makes the same complaint (Lewis 1988, 2002), as do others (Merricks 1994; Sider 2001).³⁶ The structure of the argument seems to be as follows:

- (i) In order to accommodate intrinsic change, what's predicated of the object (and at issue in the change) must be a genuine monadic property (and not a 'disguised relation').
- (ii) *P* is a genuine monadic property only if something can have *P simpliciter*.
- (iii) On the various adverbialist accounts the objects don't have the properties *simpliciter*, i.e. they don't *just have* what are supposed to be their intrinsic properties.
- (iv) So the various adverbialist accounts cannot accommodate temporary intrinsics.

At first glance, this argument seems simply to beg the question, since it specifies what it is to be an intrinsic property in terms of a particular primitive predication relation *having simpliciter*. (It also assumes what was questioned earlier, that intrinsic properties must be monadic.) But why must we understand predication in just this way? If the primary concern is simply whether we can avoid treating intrinsic qualities as relational, all of the accounts that temporally qualify instantiation would seem to do fine. For example, on the SOFist account there is no reason whatsoever to think that the state of affairs type *the candle's being bent* involves a relational property. The bentness—which is the property at stake in the change—is nothing other than the property that the candle has when the type state of affairs obtains (in other words: it is the property *of the candle* in the token state of affairs).

Perhaps, however, the concern is about the nature of objects on a model that temporally relativizes instantiation.³⁷ If objects don't *just have* their properties, but their having is somehow mediated, distanced, then what is the nature of the enduring object? Does it have any intrinsic properties other than its essential properties? Even if it is not a 'bare' particular, is it stripped down too far to plausibly count as an

³⁶ I don't mean to suggest that this complaint is the only one lodged against those who seek to explicate change in a way that qualifies how things have their properties. See e.g. Hawley (2001, e.g. sect. 1.5).

³⁷ There are several ways of using the term 'nature'. Here I'm following Lewis in meaning not the essence, but the way the object is in itself. Something like how it is intrinsically. Though as before we must be cautious about making robust assumptions about what counts as intrinsic.

ordinary object, one of the apples and bananas, candles and daffodils, that make up our world? (See Lewis 1988; cf. Hawley 2001, sect. 1.4.)

The SOFist (and other eternalist endurantists) should, I believe, reject this question. Note that the competing views can also be forced to think of objects as stripped down to their essences. For example, we can ask the presentist: Tell me about this object that *was* wholly present and *is now* wholly present, the one that just has bentness now, and just had straightness before: what is *its* nature? If the presentist accepts the question, then he will have to face the same concerns about the 'thinness' of the object. Even the perdurantist will have trouble answering the question: Tell me more about the nature of the perduring thing, that persisting thing with a straight-stage and a bent-stage: what is *its* nature?

A presentist should answer: If you are interested in the object's nature, then you have to consider how it is now or how it was before . . . etc. There's no way to give an answer 'from nowhere' or more precisely 'no time'. A perdurantist should answer: If you are interested in a perduring thing's nature, you have to consider what its stages are like. But why should a SOFist (or any of the other eternalist endurantists) have to say more? Why can't the same strategy work? If you want to know what the object itself is like—what its nature is, how it is intrinsically—one can only answer from a point of view in time: one can say how it was in the morning, is now, or will be tomorrow. It exists eternally, but it doesn't follow that we can describe its nature from an eternal standpoint; we can describe some of the states of affairs it functions in, and these obtain at times, but it isn't as if we can talk about it outside of any state of affairs.

Setting this worry aside, though, there remains still a further way to develop the concern. As we've seen, there are at least two elements of the SOFist picture that might count as loosely predicative: the relation between the candle and bentness in the type state of affairs (the candle's *being bent*—in the type-constituting way), and the obtaining of the type state of affairs. Consider the first: the *being* that constitutes states of affairs types is unqualified: time doesn't play a role in their constitution. But if the enduring candle is an element of two (existing) states of affairs, namely, *the candle's being bent* and *the candle's being straight*, then these states of affairs must be compatible, otherwise we'd be faced with a contradiction. Recalling that we are concerned here with states of affairs types, one way to avoid contradiction would be to say that the property isn't being genuinely predicated of the object in the types; perhaps states of affairs types should be understood as ordered pairs or the like. But then the ontological force of predication must occur when the state of affairs type *obtains*: it is only in the token that the candle really *is bent*. Contradiction is avoided here because the instantiation of the type in the token, i.e. the type's obtaining, is temporally relativized: *the candle's being straight* obtains at *t*, *the candle's being bent* obtains at *t'*. So, the critic continues, the view must be that the type's being instantiated in a token consists in the property's being genuinely instantiated in the object *at a time*. In other words, the object can only

really *have* its temporary properties if it has them at a time. But this just collapses into the relational account.³⁸

There are two points to make in response to this objection. The first is to deny that the obtaining of a (type) state of affairs is a matter of a potential instantiation being, one might say, activated or implemented (at a time). After all, we don't normally think of the relation between types and tokens in this way; for example, I'm not even sure how to apply this suggestion to the relation between my token copy of *On the Plurality of Worlds* and the type. Admittedly more needs to be said about the type-token distinction for it to illuminate the relation between possible states of affairs and concrete (occurring) states of affairs. But the SOFist's suggestion is that, in saying that the candle is straight, one is claiming that the concrete state of affairs of *the candle's being straight* (delimited with respect to the present) is of the type *the candle's being straight*. Although it is possible to construe the token state of affairs as existing just when the relation *obtaining at* holds between a possible state of affairs and a time, it is equally possible to construe the token state of affairs as basic. If so, it would be wrong to construe the token state of affairs as somehow constituted by a relation between the type and the time.

However, *even if* a token state of affairs is a type state of affairs obtaining at a time, and so involves a kind of temporal relativization of the 'obtaining', the point of resisting temporal relativization was to preserve the intimate relation between the *persisting object* and the *properties* involved in intrinsic change. This is not the relation at issue in the obtaining of the state of affairs; so it isn't obvious why we can't allow the obtaining to be temporally qualified.

The second point is to challenge directly what seems to have been an underlying assumption throughout the debate, namely, that our fundamental ontology consists of objects and properties and these somehow constitute states of affairs. A different model takes token states of affairs to be the fundamental entities, and treats objects and properties as in an important sense derivative (Armstrong 1990, 1997; Barwise and Perry 1983: 58; Barwise and Etchemendy 1987). On such a view concrete (token) states of affairs such as *the candle's being bent at t* are the world's building blocks, and the candle, the property *being bent*, and the (type) state of affairs *the candle's being bent* are all, in a sense, abstractions; or, if not abstractions (which can suggest something 'in the mind'; cf. Fine 1998; Simons 2000a), then at the very least the token states of affairs are not constituted mereologically from objects and properties. Moreover, on this approach our ordinary judgements concern token states of affairs and their types. The tokens can be understood as the obtaining of state of affairs types at times, but this is not an 'analysis' of them.

³⁸ Thanks to Dean Zimmerman for helping me see the force of this objection. I've articulated it here in a way that collapses into the relational account because I've been explicating the SOFist view in eternalist-non-tenser form. But if one opted for a different form of SOFism, it might collapse into the presentist-serious tensor solution.

On this model, predication does not function as a way to build facts or states of affairs out of more basic entities (objects and properties), for the token states of affairs are basic. To charge, then, that the SOFist is relying on a 'disguised' relational model of predication is to insist that the SOFist frame her view in a substantialist ontology, but this simply begs the question.

In other words, perhaps the underlying charge against the SOFist is that our ordinary subject-predicate statements must express a basic predication between object and property; this is what the SOFist is missing.

- (6) *Unqualified predication condition.* To say that an object has a property (that x is F) is to say that there is an unqualified predication holding between the object and the property; (and similarly, what makes it the case that objects stand in a relation (that xRy) is an unqualified predication holding between the objects and the relation).

Note that this condition articulates both a semantic intuition and an ontological intuition. Is it fair to interpret this principle as what's at issue? Presumably the SOFist would deny that we need accommodate this condition. On the SOFist account, statements of this form do not express an unqualified predication relation between the object and the property in the sense that the presentist and perdurantist seem to want. But little, if anything, seems to be lost if the endurantist does not meet this demand. And without (6), the arguments against the SOFist are unconvincing.

II. CONCLUSION

So where do we stand? We've explored a broad range of views on the issue of persistence through time and the problem of alteration. In particular, we've considered in detail:

Perdurant theory. Objects persist only by perduring. There are perduring, but no enduring or exduring, particulars.

Exdurant theory (aka stage theory). Ordinary objects persist by exduring. There are (weird) perduring particulars, and no enduring particulars.

Endurant theory. Ordinary objects persist by enduring. There are enduring particulars, and there may or may not be perduring or exduring particulars as well.

Each of these views has versions that take different stands on the presentism-eternalism debate, and on the serious tensing question. Moreover, I've considered

four different versions of the endurance theory (relationalism, copula-tensing, adverbialism, and SOFism) distinguished by their different approaches to predication. All of the views preserve the idea that, in some sense, ordinary things persist through change; and all of them require that we at least modify if not reject one of our original assumptions. I have not considered, although relevant and interesting, approaches to the puzzle that question underlying assumptions about identity, e.g. Leibniz's law (aka the principle of the indiscernibility of identicals) (Baxter 1988, 2001; Myro 1986), and objections drawing on results in contemporary physics (Balashov 2000a,b,c). The line had to be drawn somewhere.

At this stage of the debate I think we should conclude that the constraints on an acceptable account (especially if we confine ourselves to the agreed constraints) aren't enough to decide between several plausible options. There may well be a cluster of yet unarticulated 'Moorean facts' to which we all must do justice and yet only one view can handle. But we have not found such a cluster of facts that only one view can accommodate, and I have my doubts about whether the debate can be settled in this way even over the long run. Instead, I believe that a convincing argument for one view over the others will depend on pragmatic and contextual considerations. What we need is a clear articulation of what's at stake in our accounts of change, of predication, of intrinsic properties. Is there anything that hinges on which account of these notions we opt for? My own conviction is that a number of our practices and forms of self-understanding depend upon the idea that there are enduring things, and persons are among them. But I do not believe that there are arguments from neutral starting points that lead to this conclusion, nor do I believe that those who opt for different starting points from mine are being irrational. This is an area where, I suspect, there are a number of rationally acceptable alternatives, and figuring out what they are and what they each offer us is about the best we can do.

REFERENCES

- Armstrong, David (1978). *Nominalism and Realism*. Cambridge: Cambridge University Press.
 — (1980). 'Identity through Time,' in P. van Inwagen (ed.), *Time and Cause*. Dordrecht: Reidel, 67–78.
 — (1990). *A Combinatorial Theory of Possibility*. Cambridge: Cambridge University Press.
 — (1997). *A World of States of Affairs*. Cambridge: Cambridge University Press.
 Austin, John L. (1950). 'Truth,' *Proceedings of the Aristotelian Society*, suppl. vol. 24: 111–28.
 Repr. in Austin, *Philosophical Papers*, 2nd edn., ed. J. O. Urmson and G. J. Warnock. Oxford: Oxford University Press, 1961, 117–33.
 Balashov, Yuri (2000a). 'Relativity and Persistence.' *Philosophy of Science*, 67: 549–62.
 — (2000b). 'Persistence and Space-Time: Philosophical Lessons of the Pole and Barn.' *The Monist*, 83: 321–40.

- Balashov, Yuri (2000c). 'Enduring and Perduring Objects in Minkowski Space-Time'. *Philosophical Studies*, 99: 129–66.
- Barwise, Jon, and John Etchemendy (1987). *The Liar: An Essay in Truth and Circularity*. Oxford: Oxford University Press.
- and John Perry (1983). *Situations and Attitudes*. Cambridge, Mass.: MIT Press.
- Baxter, Donald (1988). 'Identity in the Loose and Popular Sense'. *Mind*, 97: 575–82.
- (2001). 'Loose Identity and Becoming Something Else'. *Noûs*, 35: 592–601.
- Bigelow, John (1996). 'Presentism and Properties', in J. E. Tomberlin (ed.), *Philosophical Perspectives*, x. Cambridge: Basil Blackwell, 35–52.
- Bradley, F. H. (1897). *Appearance and Reality*, 2nd edn. Oxford: Oxford University Press.
- Callender, Craig (2001). 'Humean Supervenience and Rotating Homogeneous Matter'. *Mind*, 110: 25–43.
- Carter, William, and H. S. Hestevold (1994). 'On Passage and Persistence'. *American Philosophical Quarterly*, 31: 269–83.
- Cartwright, Richard (1975). 'Scattered Objects', in Keith Lehrer (ed.), *Analysis and Metaphysics*. Dordrecht: Reidel, 153–71.
- Chisholm, Roderick (1970). 'Identity through Time', in H. Kiefer and M. Munitz (eds.), *Language, Belief, and Metaphysics*. Albany: State University of New York Press, 163–82. Repr. in van Inwagen and Zimmerman (1998: 173–85).
- (1973). 'Parts as Essential to their Wholes'. *Review of Metaphysics*, 26: 581–603.
- (1975). 'Mereological Essentialism: Further Considerations'. *Review of Metaphysics*, 28: 477–84.
- Craig, William Lane (1998). 'McTaggart's Paradox and the Problem of Temporary Intrinsic'. *Analysis*, 58: 122–7.
- Fine, Kit (1998). 'Cantorian Abstraction: A Reconstruction and a Defense'. *Journal of Philosophy*, 95: 599–634.
- Forbes, Graham (1987). 'Is there a Problem about Persistence?' *Proceedings of the Aristotelian Society*, suppl. vol. 61: 137–55.
- Haslanger, Sally (1989a). 'Endurance and Temporary Intrinsic'. *Analysis*, 49: 119–25.
- (1989b). 'Persistence, Change, and Explanation'. *Philosophical Studies*, 56: 1–28.
- (1992). 'Ontology and Pragmatic Paradox'. *Proceedings of the Aristotelian Society*, 92: 293–313.
- (1994). 'Humean Supervenience and Enduring Things'. *Australasian Journal of Philosophy*, 72: 339–59.
- Hawley, Katherine (1998). 'Why Temporary Properties are not Relations between Physical Objects and Times'. *Proceedings of the Aristotelian Society*, 98: 211–16.
- (1999). 'Persistence and Non-Supervenient Relations'. *Mind*, 108: 53–67.
- (2001). *How Things Persist*. Oxford: Oxford University Press.
- Heller, Mark (1992). 'Things Change'. *Philosophy and Phenomenological Research*, 52: 695–704.
- (1993). 'Varieties of Four-Dimensionalism'. *Australasian Journal of Philosophy*, 71: 47–59.
- Hinchliff, Mark (1996). 'The Puzzle of Change'. J. E. Tomberlin (ed.), *Philosophical Perspectives*, x: *Metaphysics*. Atascadero, Calif.: Ridgeview, 19–36.
- Hirsch, Eli (1982). *The Concept of Identity*. Oxford: Oxford University Press.
- Hobbes, Thomas (1839). *De Corpore*, II, ii, in *The English Works of Thomas Hobbes*, ed. William Molesworth. London: Bohn, i. 136.
- Johnston, Mark (1987). 'Is there a Problem about Persistence?' *Proceedings of the Aristotelian Society*, suppl. vol. 61: 107–35.
- Kripke, Saul (1978). 'Identity and Time'. Unpub. lecture series.
- Lewis, David (1983). 'Survival and Identity', plus postscripts, in Lewis, *Philosophical Papers*, vol. i. Oxford: Oxford University Press, 55–77.
- (1986). *On the Plurality of Worlds*. Oxford: Basil Blackwell.
- (1988). 'Rearrangement of Particles: Reply to Lowe'. *Analysis*, 48: 65–72.
- (1999). 'Zimmerman and the Spinning Sphere'. *Australasian Journal of Philosophy*, 77: 209–12.
- (2002). 'Tensing the Copula'. *Mind*, 111: 1–13.
- Lombard, Lawrence (1986). *Events: A Metaphysical Study*. London: Routledge & Kegan Paul.
- (1999). 'On the Alleged Incompatibility of Presentism and Temporal Parts'. *Philosophia*, 27: 253–60.
- Lowe, E. J. (1987). 'Lewis on Perdurantism versus Endurance'. *Analysis*, 47: 152–4.
- (1988). 'The Problem of Intrinsic Change: Rejoinder to Lewis'. *Analysis*, 48: 72–7.
- Ludlow, Peter (1999). *Semantics, Time, and Tense*. Cambridge, Mass.: MIT Press.
- McTaggart, J. M. E. (1908). 'The Unreality of Time'. *Mind*, 18: 457–84.
- (1927). *The Nature of Existence*, vol. ii. Cambridge: Cambridge University Press.
- Markosian, Ned (1994). 'The 3D/4D Controversy and Non-Present Objects'. *Philosophical Papers*, 23: 243–9.
- (2001). Review of Peter Ludlow, *Semantics, Tense and Time*. *Journal of Philosophy*, 98: 225–9.
- (forthcoming). 'A Defense of Presentism'. *Oxford Studies in Metaphysics*.
- Mellor, D. H. (1981). *Real Time*. Cambridge: Cambridge University Press.
- Merricks, Trenton (1994). 'Endurance and Indiscernibility'. *Journal of Philosophy*, 91: 165–84.
- (1995). 'On the Incompatibility of Enduring and Perduring Entities'. *Mind*, 104: 523–31.
- (1999). 'Persistence, Parts, and Presentism'. *Noûs*, 33: 421–38.
- Myro, George (1986). 'Identity and Time', in Richard Grandy and Richard Warner (eds.), *The Philosophical Grounds of Rationality*. New York: Clarendon Press, 383–409.
- Oaklander, L. Nathan (1992). 'Temporal Passage and Temporal Parts'. *Noûs*, 26: 79–84.
- Parsons, Josh (2000). 'Must a Four-Dimensionalist Believe in Temporal Parts?'. *The Monist*, 83: 399–418.
- Perry, John (1979). 'The Problem of the Essential Indexical'. *Noûs*, 13: 3–21.
- Prior, A. N. (1959). 'Thank Goodness that's Over'. *Philosophy*, 34: 12–17.
- Quine, W. V. O. (1963). 'Identity, Ostension, and Hypostasis', in Quine, *From a Logical Point of View*, 2nd edn. Evanston, Ill.: Harper & Row, 65–79.
- Rea, Michael (1996). *Material Constitution*. Totowa, NJ: Rowman & Littlefield.
- (1998). 'Temporal Parts Unmotivated'. *Philosophical Review*, 107: 225–60.
- Sainsbury, R. M. (1995). *Paradoxes*. Cambridge: Cambridge University Press.
- Sider, Theodore (1996). 'All the World's a Stage'. *Australasian Journal of Philosophy*, 74: 433–53.
- (1997). 'Four Dimensionalism'. *Philosophical Review*, 106: 197–231.
- (1999). 'Presentism and Ontological Commitment'. *Journal of Philosophy*, 96/7: 325–47.
- (2000). 'The Stage View and Temporary Intrinsic'. *Analysis*, 60: 84–8.
- (2001). *Four-Dimensionalism: An Ontology of Persistence and Time*. Oxford: Oxford University Press.
- Simons, Peter (1987). *Parts: A Study in Ontology*. New York: Clarendon Press.
- (2000a). 'How to Exist at Time when you have no Temporal Parts'. *The Monist*, 83: 419–36.
- (2000b). 'Identity through Time and Trope Bundles'. *Topoi*, 19: 147–55.

- Smith, Quentin (1993). *Language and Time*. Oxford: Oxford University Press.
- Thomson, Judith J. (1983). 'Parthood and Identity across Time'. *Journal of Philosophy*, 80: 201–20.
- van Inwagen, Peter (1981). 'The Doctrine of Arbitrary Undetached Parts'. *Pacific Philosophical Quarterly*, 62: 123–37.
- (1990). 'Four-Dimensional Objects'. *Noûs*, 24: 245–55.
- (2000). 'Temporal Parts and Identity across Time'. *The Monist*, 83/3: 437–59.
- and Dean Zimmerman (ed.), (1998). *Metaphysics: The Big Questions*. Oxford: Basil Blackwell.
- Zimmerman, Dean (1996). 'Persistence and Presentism'. *Philosophical Papers*, 25: 115–26.
- (1998a). 'Temporary Intrinsic and Presentism', in van Inwagen and Zimmerman (1998: 206–19).
- (1998b). 'Temporal Parts and Supervenient Causation: The Incompatibility of Two Humean Doctrines'. *Australasian Journal of Philosophy*, 76: 265–88.
- (1999). 'One Really Big Liquid Sphere: Reply to Lewis'. *Australasian Journal of Philosophy*, 77: 213–15.

PART V

EVENTS, CAUSATION,
AND PHYSICS