New Papers on the Present

Philosophia
Basic Philosophical Concepts
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New Papers on the Present
Focus on Presentism

Philosophia

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Preface

Presentism is the view that only the present exists. Eternalism, by contrast, is the view that present, past and future objects and times exist. Philosophers have been divided for centuries regarding whether reality is an ever changing present consisting of objects and events coming into and out of existence, or whether reality is composed of all that did, does, and will exist. On the one hand, presentism and the associated dynamical view of time look closer to common sense and to the way we ordinarily think and talk about past and future objects; on the other hand, there are aspects of common sense talk that are more easily accommodated by eternalism, and, arguably, eternalism is a better fit with contemporary science. In the last two decades in analytic philosophy both positions have been defended and the literature flourishes with arguments for and against each of them, along with a huge family of alternative proposals.

This proliferation of views and the many attendant discussions provides evidence for the importance of the issue in the contemporary philosophy of time. The present volume targets anyone who is interested in metaphysics and the philosophy of language, from those who are new to the philosophy of time to those whose studies are more advanced. It provides updated and refined research perspectives on topics such as the status of the present, the groundedness of truth, cross-temporality, the passage of time, and the methodological assumptions behind the debate between presentists and eternalists.

The book is divided into three parts. The first, containing three papers, focuses on the characterization of the central tenets of pre-

sentism (by Neil McKinnon) and eternalism (by Samuel Baron and Kristie Miller), and on the 'sceptical stance' (by Ulrich Meyer), a view to the effect that there is no substantial difference between presentism and eternalism.

The second and main section of the book contains three pairs of papers that bring the main problems with presentism to the fore and outlines its defence strategy. Each pair of papers in this section can be read as a discussion between presentists and eternalists, wherein each directly responds to the arguments and objections offered by the other. This is a discussion that is sometimes absent in the literature, or which is at best carried out in a fragmented way.

The first two papers of the section deal with the problem of the compatibility of Special Relativity Theory (SRT) and presentism. SRT is often considered to be a theory that contradicts the main tenet of presentism, thereby rendering presentism at odds with one of our most solid scientific theories. Christian Wüthrich's paper presents arguments for the incompatibility of the two theories (SRT and presentism) within a new framework that includes a discussion of further complications arising from the theory of Qauantum Mechanics. Jonathan Lowe's paper, by contrast, develops new general arguments against the incompatibility thesis and replies to Wüthrich's paper.

The second pair of papers focuses on the problem that presentists face, in providing grounds for past tensed truths. In the first (by Matthew Davidson), new arguments are provided to defend the idea that the presentist cannot adequately explain how what is *now* true about the past is grounded, since for the presentist the past is completely devoid of ontological ground. The second paper (by Brian Kierland) takes up the challenge of developing a presentist explanation of past truths, beginning by outlining some existing views in the literature before advancing an original proposal.

Traditionally, presentism is also said to have a problem with cross-temporal relations, that is, those relations that (as least ac-

cording to the presentist) hold at one time even though one of their relata does not exist it that time. Causal relations are the most prominent and troublesome of such relations. Roberto Ciuni and Giuliano Torrengo's paper questions the soundness of the common strategies deployed by all tee main pre-sentist accounts of cross-temporal relations. While Berit Brogaard's paper questions whether the arguments from cross-temporal relations really do land any blows against presentism. She then replies to the criticisms presented in the precedent paper.

The third and last section consists of two papers that present non-standard alternatives to presentism and eternalism, that is, theories that try to overcome the methodology and general assumptions that gave rise to the presentism/eternalism debate. Jonathan Tallant's paper discusses and criticizes the "heterodox" presentist theory presented by Kit Fine, a theory that aims to avoid the main problems of "standard" presentism whilst retaining the attractive features of the view. According to Tallant, however, Fine's theory fails to allow us to have the best of both worlds, and he suggests that those attracted to presentism should instead look to a better formulation of a "traditional" version of presentism. The last paper presents some developments to the conceptual approach proposed by Yuval Dolev, which aims to overcome the metaphysical debate between presentism and eternalism, without falling into some sceptical position. Dolev argues that the eternalists are right in criticizing the presentist conception of present, but they are mistaken in concluding that tenses are metaphorical. Rather, the ontological import of the debate should be downplayed to a phenomenological reading, in order to reach a new understanding of what makes the present metaphysically special.

The book is to be read as a coherent whole and not as a series of disparate papers on a similar theme; it settles the terms and methelology oh the debate, weighs the costs and benefits of each position and considers the plausibility of alternative solutions. The papers offered are novel, and add to the literature on the philosophy of time, while at the same time they are written so as to focus on the core issues at play in the debate and not to get bound up in

small technical side issues. This is why they are of general interest both to specialists in the philosophy of time and to those who are approaching these issues for the first time. Bibliographies will be found at the end of each paper, and we hope they will constitute a helpful research tool for the reader.

Before closing the preface, we wish to thank the authors for taking part in this intellectually stimulating enterprise, and Julian Pfeifle and Guido Governatori for their decisive contributions to the editing and formatting of the volume.

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Part 1

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The debate

Characterizing Presentism

Neil McKinnon

1. Introduction

What is time, that it should slip through our fingers so? Once, I was a little boy playing in the sandpit with other children. What happened to the little boy? Where the sandpit was, there is now something else—where did it go? Half my life is over. Where did that go? These sorts of thoughts trouble most of us at one time or another. They are fodder for poets, playwrights, songwriters, and clinical psychologists. These questions focus on the transient aspect of time, and clearly, they bear a great deal of emotional import. And, depending on what we think time is really like, these questions receive differing answers. In particular, the two most prominent views about time's nature give radically divergent answers to these questions.

The eternalist picture (elaborated in detail in Kristie Miller's contribution) tells us that the little boy, the sandpit and the first half of my life didn't really go anywhere. They all exist, inhabiting their own little portion of the four-dimensional world. On this picture, the feeling I have that they are gone from reality is an illusion of perspective. From my current position, that of a man whose life is half over, they are accessible to me only by the traces they have left. But they haven't gone anywhere. By contrast, presentists take our impression that these things have somehow or other disappeared, very seriously. Presentists say the feeling I have that these things are gone from reality is veridical rather than illusory: the

sandpit no longer exists—it is no longer among the things that are real.[1] Likewise, many of the various ways I have been are no longer real. Or, to be more precise, there are many properties (such as boyhood) whose instantiation by me are no longer features of reality.

There has been recent interest in the question of whether eternalists and presentists have succeeded in characterizing distinct metaphysical pictures, and hence, whether presentists and eternalists are engaged in a genuine metaphysical disagreement. That question is not our focus (it is taken up in Ulrich Meyer's contribution). However, we can make a mark on that debate by doing our best to state the presentist view, and, in particular, by establishing what distinctive primitive notions presentists must appeal to. Others can then decide whether we have picked out genuine differences between presentism and eternalism, or whether these 'distinctive primitive notions' are really nothing more than notational variants of things that eternalists say.

2. What should an account of presentism accommodate?

First and foremost, a good account will not rule out ways things could be that are plausibly consistent with presentism. Here, I will outline some circumstances that I think our definition of presentism ought to accommodate.

Time could be *circular*; that is, it could have a closed structure. So, for instance, things that are entirely in the past might also be entirely in the future.[2] It is harder to believe that time could be circular if we are presentists than if we are eternalists. But it is not *that* much harder. The main worry we might have in mind is this: in circular time, whatever happens happens only once. But don't

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[1] Later, I will question whether it is an essential feature of presentism that the sandpit has passed out of existence.

[2] On presentism and circular time, see [Prior 1967], pp. 63–66 and [Monton 2003].

presentists believe that time passes in a robust way? If so, isn't the passage of time inexorable? If something has happened and will happen, doesn't that mean that it will eventually be the case that it has happened twice? Presentists can resist this line of thought. To think this way is to make too much of analogies between the passage of time and changes of place. So, for instance, if we think of the present as being like a toy train that has been forever revolving on a circular, frictionless track, it is hard to see how time could be circular; it may seem that the closest approximation the presentist can countenance is an open structure, where everything happens more than once. However, presentists can avoid treating these sorts of analogies as anything more than heuristic devices.[3]

Presentism should also be consistent with open structures where everything happens multiple times: these are so-called *recurrence* scenarios. In these scenarios, a history plays out, and then it all happens again in exactly the same way. Indeed, these 're-plays' could go on forever. Recurrence situations where the replays are mere duplicates of each other are metaphysically controversial if we suspect that a suitable version of the Identity of Indiscernibles might rule them out. On the other hand, situations where the very same people relive the very same lives between periods of non-existence, are controversial if we think that intermittent existence is questionable, or if we think that they breach criteria of identity over time. For our purposes, only the second group of situations turns out to be problematic. And the reason they cause trouble lies in the view of persistence they embody, namely, that things persist by *enduring* (roughly speaking, the view that things persist by being wholly present at more than one time).[4] That our definition of presentism be consistent with persistence by endurance is crucially important, since the great majority of presentists are also endurantists.

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[3] See [Prior 1968] and [Christensen 1976].
[4] See [Crisp and Smith 2005] for more detailed suggestions about defining endurance.

Could there be time without change? I think there could be, and that presentists should believe that there could be.[5] When I say this, I mean that there could be time without change in the strongest sense. For instance, in circumstances such as Shoemaker's global freeze scenario,[6] frozen people continue to age chronologically, if not physiologically. Perhaps we could call this ageing a kind of change. But, so it seems to me, presentism ought also to be consistent with scenarios where nothing changes, not even in the sense of chronological ageing. Presentists ought to allow for worlds with infinite pasts and futures where the items in those worlds have always existed, will always exist, and do not change in any of their ordinary intrinsic and extrinsic properties. This means that we ought to avoid any account which characterizes presentism in terms of changes in which facts obtain.

Might the present have a non-zero duration? Could there be presentist worlds where co-existing entities stand in temporal separation relations? If we answer yes, then we think that thick presentism7 ought not to be definitionally excluded.8 For the purposes of this contribution, thick presentism is ruled in. Indeed, it will turn out to have an interesting role in helping us to decide whether presentism can be differentiated from other so-called tensed, or dynamic, views of time.

Last of all, it would be nice to loosen some of the ties between presentism and existence. Some presentists have believed in non-existent Meinongian objects.9 Talk of non-existent objects in a presentist setting ought to be demonstrably different from talk of non-existent objects in a eternalist setting. We might even want to allow for worlds where nothing exists, but there 'are' non-existent objects. If so, we break the usual necessary connection between

[5] [McKinnon ms.].
[6] [Shoemaker 1969].
[7] I appropriate this label from [Hestevold 2008].
[8] For discussion of thick presentism, see [Dainton 2001], Ch. 6 and Section 7.8, and [McKinnon 2003]. For an endorsement of thick presentism, see [Hestevold 2008].
[9] For instance, [Routley 1980] and [Hinchliff 1996].

presentism and existence. Although I am not a Meinongian, it would be desirable not to rule out Meinongian presentism by fiat.

3. Defining presentism: some preliminary attempts

A familiar way of generalising the claims about reality presented in the introductory section runs like this: only present entities exist. So, while eternalists happily commit to all manner of entities that, from our perspective in space-time, are past or future, presentists restrict ontology to present entities. This way of characterizing presentism may be found in many places.[10] It is a simple formulation, and it seems to be on the right track. So let us start here:

(1) *Only present entities exist*

A first question we might ask is whether we should put (1) in the scope of a necessity operator, so that it reads, *necessarily, only present entities exist*.[11] I suggest that we don't do this. We want to determine what presentism *is*, not its modal status.[12]

We could ask worthwhile second questions about the meaning of every word in (1). While there is certainly value in asking these questions, I want to put these refined, detailed matters aside. Let us see first whether (1) and various informally stated variants and alternatives to (1) can draw us close to understanding presentism. I will claim that all such statements (or, to be more accurate, those that occur to me) fail. However, some do better than others. Seeing which ones do best should be a helpful way to isolate a starting point for subsequent refinement.

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[10] See, for instance, [Bigelow 1996], p. 35, [Markosian 2004], n. 1, [De Clercq 2006], p. 386, [Benovsky 2009], p. 291. To be fair, it is not always clear whether these curt statements of presentism are meant to be definitive. It is likely that often we are being offered a working definition.

[11] [Markosian 2004], n. 1, does this.

[12] If you disagree and think that such a necessity claim really is part of the content of presentism, it can be easily introduced.

In favour of (1), we may say the following. It cannot be satisfied by timeless worlds – on the supposition that something exists, that thing has a temporal feature, namely, being present. In a circular time scenario, being present is no bar to being past or future. There is consistency too with endurantism: nothing in (1) tells us that you can't be past and future as well as present. (1) does not rule out the possibility of time without change, since it tells us that only present things exist, not whether they are changing things. And there is also consistency with thick presentism. The big problem with (1), which has been noted in many places, is that it is consistent with eternalism. Eternalists say that any temporal item is present from its own perspective. So eternalists can agree with (1).

Instead, we might try the following:

(2) *Only entities that are simultaneous with each other exist*[13]

Inconsistency with eternalism is secured by (2), since eternalists admit entities that are earlier or later than each other and hence, not simultaneous. Unfortunately, (2) does not cohere with thick presentism, since thick presentists admit non-simultaneous entities. We might ask whether there is some other sense of simultaneity according to which thick presentists say that everything is simultaneous. The obvious sense available to us, though, is of no assistance: that is the sense according to which everything that exists is present. And this brings us back to where we started, with (1).

(3) *No past or future entities exist*

This is an obvious fix: (3) is not consistent with eternalism. Eternalists say that there are perspectives according to which each entity is past, and perspectives according to which each entity is future. Nevertheless, there are a number of problems with (3), one of which being that it is not consistent with endurance: if you endure, you are not only a present thing, but also a past or future thing. True enough, (3) counts as consistent with endurance (on a

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[13] See [Crisp 2007], p. 103.

technicality) if we take thick presentism into account. Thick presentism allows you to be stretched out in time, and therefore, to endure, without requiring that you be past or future. But, if (3) is right, then thick presentism allows things to endure only so long as the extent of the present. So, in summary,

(3) does not allow for anywhere near as much endurance as it should. Therefore, it is unsatisfactory.

Perhaps what we really had in mind, then, was that nothing exists which is entirely past or future. What is it for something to be entirely past or entirely future? We might try this:

(4) *Nothing that is past or future and not present exists*

This repairs the problem with endurance. It also restores consistency with circular time. However, it does so at a cost. (4) reintroduces consistency with eternalism. Eternalists agree that everything which is past or future is also present. (4) is inadequate in other ways, too—ways that affect (3) also. Unsurprisingly, (4) is inconsistent with circular time. (4) is exclusionary; it does not tell us anything about how things are. Indeed, it does not tell us that there is anything, or any way, that things are. Moreover, it is consistent with timeless worlds.14

At this point, we might try a slight change of focus. Modal actualists construct ersatz possible worlds out of actual resources. As has been observed in a number of places, presentists can construct ersatz times from present resources.[15] If, for instance, ersatz times are maximal consistent conjunctive propositions, the thought is that

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[14] In [McKinnon 2003], p. 305, I supplemented (3) with a positive claim about there being change with respect to which facts characterize the world. In Chapter 2.2 of the present volume, Lowe characterizes presentism in terms of change with respect to which entities exist. I now think that these sorts of approach will not do, since they rule out time without change scenarios.

[15] For example, [Prior and Fine 1977], [Bourne 2006] and [Crisp 2007].

only one time represents with complete accuracy the way things are. So, we could try the following:

(5) *Only one time is true*

This does quite well with almost all of the 'test-issues'. It is not consistent with eternalism, since even if we admit that eternalism is consistent with the existence of ersatz times as well as concrete ones, eternalists can't allow that only one of these ersatz times is true. (5) is also consistent with endurantism and closed time, and does entail that the world is not timeless.[16] However, it does not gel with thick presentism. Perhaps we could try this alternative instead:

(6) *There is a largest true interval*

Here, we allow that times are special cases of intervals, so as to capture presentisms both thick and thin. (6) broadens (5) so as to admit ersatz intervals, one of which, the thought goes, fully characterizes the way things are. However, we might wonder whether (6) reinstates consistency with eternalism. After all, both thick presentism and eternalism allow that there are concrete intervals. The thick presentist can then say that just one of the ersatz intervals fully characterizes the largest concrete interval. Can't eternalists say the same? After all, eternalists can say truly (putting relativistic considerations aside) that there is a largest concrete interval. They can also note that there is a maximal conjunctive proposition which says everything there is to be said about that concrete interval. Why not call that an ersatz interval? If this is done, then eternalists agree with (6).

Now, it may be that if we were to investigate this matter in detail we would find salient differences between the propositions out of which eternalist and presentist ersatz intervals are built, and

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[16] Does (5) allow for time without change? I think this is tricky, and a discussion here would take us too far afield. See [Le Poidevin 1991], Sections 3.3 and 3.5, [Fine 2005] pp. 165–66, and [Bourne 2006], pp. 67–68.

differences in the ersatz earlier-than relation that holds between distinct ersatz intervals. Working out what those differences are might bring us closer to establishing what distinguishes presentism and eternalism. But it would also take us further away from the thought that the real difference between the views can be captured in terms of ersatz intervals. I take it that the most telling problem with (6) is that it tells us something about the propositions that would be true in a presentist world, but that this doesn't get us to the heart of what presentism is, as a metaphysical picture.

None of the attempts at characterizing presentism surveyed in this section are satisfying. For convenience, I list them below:

(1) *Only present entities exist*
(2) *Only entities that are simultaneous with each other exist*
(3) *No past or future entities exist*
(4) *Nothing that is past or future and not present exists*
(5) *Only one time is true*
(6) *There is a largest true interval*

(1), (4) and perhaps (5) and (6), do not succeed in distinguishing presentism and eternalism. (2) and (3) are not consistent with eternalism. But they do not accommodate thick presentism.

Despite the fact that it is consistent with eternalism, I think (1) remains the best starting point for developing a satisfying account of pres entism. Unlike (3) and (4), it is not exclusionary; rather, it makes a positive claim. It also seeks to paint an explicitly unified picture—presentism is a view about everything, and tells us what everything has in common, namely, presentness. In that respect, (1) is more compelling as an *account* of presentism than (5) and (6), which portray presentism elliptically, in terms of which abstract representations happen to be true.

4. Ways of existing?

Focus on the way in which (1) is attractive: it looks for some key feature, and tells us that presentist worlds are ones where everything has that feature. Thinking of presentness as a feature of the things that exist did not seem to help, at least at first blush. Might we gain some traction by considering how presentists and eternalists understand presentness? Perhaps examining the relevant notions of presentness and seeing how they differ will allow us to draw the distinction after all.

We could observe that presentness is a matter of perspective for eternalists, but not for presentists, since presentists do not take presentness to be any kind of relation. That tells us what presentists think presentness *isn't*, but what sort of positive account can we give? Is presentness, for example, a non-relational property that everything has? It seems to me that the chief virtue of thinking so is that it would allow us to dis-tinguish eternalism and presentism. Yet, it has seemed implausible to most presentists that presentness is such a property.[17]

What if, instead of taking 'present' in (1) as a modifier of 'entities', we take it as a modifier of 'exists', giving us:

(1a) *Every entity presently exists*

In particular, the thought is that the difference between presentism and eternalism lies in the nature of existence. So, what distinguishes the two is that each involve different ways, or modes, of existence. On this sort of picture, presentists operate with a tensed understanding of existence, while eternalists appeal to a tenseless understanding. To illustrate, a relevant difference between tensed and tenseless existence would be that tensed existence allows for the possibility of entities coming into and passing out of existence, whereas, on a tenseless understanding, it doesn't make sense to say that the inventory of the world could alter.

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[17] See, for instance, [Craig 1997].

As well as tensed and tenseless ways of understanding existence, there are tensed and tenseless ways of understanding properties, and the instantiation of properties. Often, presentists commit to tensed properties of some kind or other, for instance, the property of *having been a chorister*. But I do not recommend giving tensed properties a defining role, since not all accounts of presentism commit to tensed properties.[18] While presentists may be able to do without tensed properties, it is hard to see how they can do without the tensed having of properties. Perhaps the question of whether the instantiation-tie is tensed offers us another way of distinguishing presentism from eternalism. In fact, I will now argue that it makes better sense to define presentism in terms of tensed instantiation than tensed existence.

Both existence and instantiation are notoriously difficult to come to grips with.[19] Still, if presentists are going to commit to both tensed existence and tensed instantiation, it would be nice if we could explain why one is tensed in terms of the other's being tensed. I won't offer anything like a full explanation here, but I think the prospects of understanding tensed existence in terms of tensed instantiation are better than the prospects of having the explanation run the other way.

A hallmark of tensed existence is that it allows for the possibility that things come into, and pass out of, existence.[20] Roughly put, we can explain how it is that a thing goes out of existence by observing that certain properties essential to it have ceased to be instantiated in the region where that thing was. We can explain how a thing comes into existence by noting that certain properties whose instantiation are essential to the thing in question, are now,

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[18] For example, [McKinnon and Bigelow forthcoming].

[19] For recent work on both existence and instantiation, see [Vallicella 2002].

[20] An eternalist, having only tenseless existence at hand, must parse talk of a thing's coming into, and going out of, existence as a figurative way of saying where that thing's temporal boundaries lie.

but were not, instantiated in the region where that thing is. If the tensedness of instantiation is basic and the tensedness of existence is derivative, then why not formulate presentism in terms of the more basic notion? Second, formulating presentism in this way allows for a more elegant means of distinguishing presentism and the moving spotlight view, as will soon become apparent. And third, formulating the distinction in terms of instantiation allows us to elide the question of which neutral term to use in place of existence in order to keep both Meinongians and anti-Meinongians happy.

5. Ways of having properties

Here is the suggestion, then. We can capture the difference between presentism and eternalism in terms of unanalysable differences in the *way* that entities have properties. For presentists, entities have properties in a *tensed* way. Putting this in other words, the instantiation tie is tensed.[21] On the other hand, for eternalists, entities have properties in a tenseless way: in other words, the instantiation tie is tenseless. This distinction between ways of instantiating properties allows us to flesh out the claim that only present entities exist. To be present, in the sense that is definitive of presentism, is to instantiate properties in a tensed way.

I think that this is all there is to the distinction between presentism and eternalism.[22] At first blush, this looks implausible. After all, are there not other pictures of time which are often thought to come under the umbrella phrase 'tensed theories of time'? And,

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[21] My preferred view is that presentists should admit not only a present-tensed instantiation tie, but also a past (and, if required, a future) tensed tie (see [McKinnon and Bigelow forthcoming]). However, in order to distinguish presentism from eternalism, commitment to this extra tie is not required. And so, for the purposes of this paper, I will ignore this complication.

[22] Though a little more would need to be said in order to distinguish eternalism and timelessness, given that, like eternalist worlds, timeless worlds feature tenseless instantiation only.

tellingly, aren't these theories committed to a tensed way of having properties? In particular, we have the moving spotlight and the growing block pictures. I will suggest that these views are either variants of presentism, or can be formulated in ways that involve both tenseless and tensed instantiation. On either construal, they do not embody obstacles to the understanding of presentism I favour.

Let us begin with the growing block. C. D. Broad states the view thus:

> It will be observed that such a theory as this accepts the reality of the present and the past, but holds that the future is simply nothing at all. Nothing has happened to the present by becoming past except that fresh slices of existence have been added to the total history of the world. The past is thus as real as the present. On the other hand, the essence of a present event is, not that it precedes future events, but that there is quite literally nothing to which it has the relation of precedence. ([Broad 1923], p. 66.)

So, as time passes, the block (the total history of the world) grows. Whatever is temporally located is earlier, later or simultaneous with each of the other temporally located entities. And to be present is just to be earlier than nothing. Now, on this picture, if the instantiation tie is tensed, then you might wonder just what separates the growing block view from thick presentism. After all, once presentists allow that the present may have temporal extension, it is hard to see why the present could not be arbitrarily long. It is also hard to see why the present should, of necessity, always retain the same thickness. If these things are granted, then there are presentist worlds that look suspiciously like growing block worlds. In that case, there is no metaphysically significant division between presentism and the growing block. Does the sense of presentness according to which being present is to be earlier than nothing, help? Unfortunately not, since this sense of presentness, if it applies at all, applies equally to thick presentism – thick presentists say that there are entities which are earlier than nothing.

Another thing we might try is to make a small addition to the suggested account of presentism. We might observe that presentism involves not only tensed instantiation, but also, things passing out of existence. This, so the thought goes, would allow us to distinguish presentism from the growing block, since on the growing block picture, things pass into, but not out of, existence. Unfortunately, this will not help – presentism is consistent with things passing out of existence, but does not necessitate this. Presumably, there are presentist worlds where none of the concrete particulars in those worlds ever cease to be. And if we take time without change scenarios seriously, there are presentist worlds where there is no change whatsoever, and therefore, there is not even change with respect to which tensed facts exist.

If I am right, there is no genuine metaphysical distinction to be found between presentism and the growing block. We may enforce a distinction by stipulation that comports with our interests, but that's all.

Nevertheless, here is one more thing we could try. Might the growing block theory's instantiation tie be tenseless? In [Tooley 1997], Tooley has characterized the growing block in a way that has sympathy with this thought. On his view, then, there are no tensed facts, only tenseless ones. But which tenseless facts exist varies according to the growth of the block.[23] If this sort of approach works then we can indeed find a version of the growing block story that is distinct from presentism.

What, then, of the *moving spotlight* view? Again, here is Broad with a helpful orienting description:

> We are naturally tempted to view the history of the world as existing eternally in a certain order of events.

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[23] Although, things are not quite this simple. Tooley embraces mutually irreducible senses of existence, namely, existence *simpliciter* (p. 40), and existence as of a time (pp. 28–29).

Along this, and in a fixed direction, we imagine the characteristic of presentness as moving, somewhat like the spot of light from a policeman's bull's-eye traversing the fronts of the houses in a street. What is illuminated is the present, what has been illuminated is the past, and what has not yet been illuminated is the future ([Broad 1923], p. 59).

On this sort of view, it is natural to think of the instantiation tie as tensed: Today is present, yesterday is past, and tomorrow is future. In particular, it is tempting to think of it as being *present-tensed*. Perhaps this looks worrying, since it suggests that Karl Marx exemplifies whatever properties he has (including pastness) in the present. Of course, one response is just to claim that the moving spotlight theory is really just a variant of presentism involving an extra sense of presentness – namely, one denoting a special, intrinsic and unanalysable property.

What if we don't like that response? We might want to agree that Marx is past in the present *without* claiming that this involves Marx himself instantiating any property whatsoever in a tensed way: to say that Marx is past is to say that, considered from the perspective of the present moment, Marx is past. This does look like the kind of thing an eternalist would say, namely, that being past, like being present, is just a matter of which time we take to be our reference point. But there may be another way to understand this.

The best way of reading 'past in the present' here, I think, gestures towards a reduction of pastness, so that to be past is just to be earlier than whichever time has the property of being present. And, indeed, this reading fits quite nicely with Broad's description of the view, namely, that the only 'special' property is presentness, and that it passes along a fixed series of events.[24] Perhaps the moving

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[24] Though not with McTaggart's view. McTaggart took the properties of pastness and futurity, like the property of presentness, to be ontologically basic ([McTaggart 1908], p. 467). And so, arguably, 'moving spotlight' is

spotlight theory can take all instantiation as tenseless, except for the tensed instantiation-tie that applies to the 'special' property of presentness. If so, then Marx gets to be past without thereby instantiating any property in a tensed way. This, I think, would allow the moving spotlight theory to be distinguished from presentism.

Note also that this means of distinguishing presentism and the moving spotlight picture seems unavailable if we try to demarcate the various metaphysical pictures of time purely in terms of ways of existing. Had we done so, then this reading of the moving spotlight view could not be distinguished from eternalism, since both feature tenseless existence. The inclusion of a tensed instantiation tie in the former, but not the latter, case would be required. So it is tidier to do everything with instantiation rather than to try and do it all with existence.

6. The passing of tests

Presentism is the view that everything instantiates properties in a tensed way. This understanding of presentism is compatible with circular time and endurance. The mere fact that you (tensedly) instantiate the property of being human does not preclude you from having existed, nor does it preclude you from having instantiated the property of being human. This understanding of presentism is not compatible with eternalism, since eternalism precludes tensed instantiation. It is compatible with time without change scenarios, since the mere fact that something (tensedly) instantiates some properties does not entail that it ever instantiated different properties, nor that it ever will. There is also compatibility with thick presentism, since two entities can (tensedly) stand in precedence relations to each other.

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not an apt label for the view McTaggart expressed – on his understanding, it is not only presentness that 'moves'; pastness and futurity do so too. In addition, McTaggart would have rejected any attempt to characterize time that involved irreducibly tenseless instantiation. I suggest that philosophers who want to remain faithful to McTaggart's positive account of time ought to treat it as a form of presentism.

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Characterizing Eternalism

Samuel Baron & Kristie Miller

1. Introduction

Eternalism is undeniably a very popular view in metaphysics.[25] But there is really no single view that the name 'eternalism' reliably picks out; rather, there is a cluster of views and the conjunction of some or all of these is variously designated by 'eternalism'. In what follows we pull apart this cluster of views to present a more nuanced characterisation of the various different versions of eternalism that one finds.

More specifically, the structure of this paper is as follows. We begin by characterising the ontological foundations of eternalism, providing a precise characterisation of the eternalist's ontological commitments. We then consider the role that the so-called temporal B-series plays in eternalism, using the B-series to differentiate between a number of variations on the core eternalist position. We then go on to consider the fundamentality of the B-series. That is, we discuss whether or not the eternalist should think that the B-series is fundamental. We finish by briefly considering the relationship between presentism and eternalism. We present a new argument for the view that the ontological picture advocated by the eternalist is to be preferred to the ontological picture endorsed by presentists.

2. The Ontic Component

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[25] For example, the view is defended in some form by Putnam ([Putnam 1967]), Mellor ([Mellor 1998]) and Sider ([Sider 2001]).

Call the ontological foundations of eternalism the *ontic component*. As a first pass, the ontic component of eternalism can be stated as follows:

Ontic Component (1): The past, present and future exist (unrestrictedly).

It is our view that the ontic component, appropriately understood, is an undeniably essential component of eternalism. The use of the modifier *unrestrictedly* in the above is to draw attention to the fact that 'exists' is being used to pick out the unrestricted existential quantifier rather than a quantifier that is restricted to, say, a particular time or place. For *everyone* agrees that all and only the events and objects that exist now, exist now. The central idea behind this characterisation of the ontic component then is that while neither the past nor the future exist *now*, they do exist, *simpliciter*. In this sense the past and future are just like other locations in space: just as Hong Kong does not exist here, (since we are in Sydney) and yet it does exist. This characterisation is supposed to set eternalism apart from a view like presentism, according to which although the past *did* exist, and the future *will* exist, it is not true that either *do* exist, or from a view like the growing block model, according to which the past and present *do* exist but the future *does not* exist.

While this way of glossing the ontic component is a useful first start and gives something of the flavour of eternalism as it is most commonly defended, we can do better. Notice that the claim that the past, present and future all (unrestrictedly) exist is, at least on the face of it, consistent with it being true, at every time within a world, that the past, present and future exist, with it nevertheless being the case that the past, present and future that exist are different at each such time. That is, the ontic component so construed is compatible with the idea that the ontology of the world changes.

Indeed, it is compatible with two senses in which the ontology might change. First, it is compatible with ontic component (1) that

the world is characterised by a change in *how* things exist. More specifically, it is compatible with the ontic component so construed that the ontology of the world changes in virtue of the fact that times (and the events/objects located at those times) are constantly gaining or losing the intrinsic temporal properties of pastness, presentness and futurity. So, for instance, ontic component (1) is compatible with worlds in which there is a "moving spotlight" of presentness, which shines on progressive instants. At each moment, the instant which is "lit up" has the property of presentness, and each moment before it has the property of pastness, and each moment after it has the property of futurity.

Ontic component (1) is also compatible with a more dramatic sense in which the ontology of the world might change, namely that parts of reality might come into – or go out of – existence. For instance, in a shrinking tree world the past, present and multiple futures all exist, and future branches 'drop off' as the present moves, leaving only a single, unique history ([McCall 1996]). Thus, on this view the sum total of reality gradually *decreases*. Alternatively, in a *growing block world* the sum total of reality is constantly increasing; as the present moves new 'slices' are continually added to the 'growing salami' of the world.[26] On both views then the totality of events and objects that exist when one location is the present is different to the totality of events and objects that exist when a different location is the present. That being said, however, of this pair of views only the shrinking tree view is consistent with ontic component (1), since growing block worlds are ones in which the future does not exist and (1) states that the past, present and future all (unrestrictedly) exist.

Now, we take it to be a key feature of eternalism that the ontology of the world does not change in the more dramatic sense: all and only the times that unrestrictedly exist, exist simpliciter (we leave it open as to whether the ontology changes in the weaker sense, more on this below). Or to put the point another way, rela-

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[26] The growing block view is defended by Forrest ([Forrest 2004]), Tooley ([Tooley 1997]) and Button ([Button 2006]).

tive to any time within a world, the very same set of times exists (unrestrictedly). So if the dinosaurs were to provide a list of all the times that (unrestrictedly) exist, and if some future robot were given the same task, the two lists would be identical. That is the sense in which the ontology of the world does not change: the totality of times that compose the world is always the same; from an atemporal god's eye perspective, the world does not change. This suggests the following modification to the ontic component:

Ontic Component (2): The past, present and future exist and the set of facts regarding which temporal locations exist is unchanging.

Although this modification to the ontic component is close to what we want, we can still do better. The difficulty with both versions considered thus far is that both make reference to the past, present and future. On the face of it, this seems to suggest that there is some objective ontological distinction to be drawn between these three categories. For example, 'being past' might turn out to involve the instantiation of some special property of pastness. Although, there is scope to include an objective distinction between past, present and future within an eternalist model of time (as we shall see later on), most eternalists do not think that past, present and future are objective features of reality. As such, it would be better if we could phrase the ontic component of eternalism in a manner that is neutral between these two ways of developing eternalism. Hence, in order to avoid confusion it is useful to eradicate any mention of the past, present or future from our statement of the ontic component. Thus we suggest replacing Ontic Component (1) and (2) with:

Ontic Component (3): w is an eternalist world only if, quantifying unrestrictedly, for every time t that did, does, or will exist, t does (tenselessly) exist.

This statement of the ontic component does not yet take into account the idea that the ontology of the world is *static*, and, what's more, it replaces the notions of pastness, presentness and

futurity with mention of what did, does or will exist: that is, with further tensed locutions. Thus we suggest modifying the ontic component (3) to give us:

Ontic Component (4):[27] w is an eternalist world only if there is a set S of times $t_1,..., t_n$ such that at every t, all and only the members of S unrestrictedly exist.

Ontic Component (4) looks pretty good:[28] it captures the core idea behind a basic form of eternalism. However, most eternalists endorse a further modification to the Ontic Component in light of recent developments in physics. As stated, the ontic component makes reference to *times*. Stating the ontic component in this manner, however, is not sufficiently sensitive to the idea that talk of 'times' may be misleading in worlds in which time and space are fundamentally interwoven as, for example, in worlds like our own in which it makes better sense to talk of space-time points than of times.

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[27] Notice that it is consistent with this way of explicating the ontic component that a world in which there is just one time meets the criterion. That need not mean that such a world therefore counts as an eternalist world. This is because one of the other components of eternalism, the B-series component, places constraints on whether or not a world is an eternalist world and that component might *rule out* there being an eternalist world in which only a single time exists (more on this below).

[28] One might argue that Ontic Component (4) fails to draw a meaningful distinction between the ontol¬ogy of an eternalist world and the ontology of a presentist world. According to the presentist, there exists (unrestrictedly) a single time t. Moreover, at t, there is a set S of times $t1,..., tn$ such that at every t, all and only the members of S unrestrictedly exist. It is just that, for the presentist, S is a singleton set, since there is only one time in existence: the present time. However, we take it that presentist worlds have been ruled out in virtue of the fact that the more drastic form of ontological change, according to which things come into – or go out of – existence as the present moves, has been ruled out. This is because presentist worlds are *necessarily* worlds in which there is drastic ontic change of this sort. For further discussion of the distinction between presentism and eternalism see [Sider 2006].

In order to see the idea here, it is useful to provide a brief overview of the structure of space-time. According to the special theory of relativity, the spatial and temporal distances between events depend upon one's inertial frame of reference (roughly, a coordinate system in constant motion). It is this frame-relativity of distance, combined both with the claim that the speed of light is a constant and with the claim that the laws of nature are the same in every frame of reference, that gives rise to one of the core features of relativistic mechanics: the relativity of simultaneity. Hermann Minkowski noticed, however, that although there is no frame-invariance with regard to spatial distance or temporal distance, there is a frame-invariant *spatio-temporal* distance to be had.

Minkowski (1908) went on to develop this frame-invariant distance between events into a four-dimensional space-time manifold within which time is treated as a dimension in the manifold along with the other three spatial dimensions. To represent the connectedness of space-time points in Minkowski space-time we think of every space-time point as both the point of convergence and the point of emission of a spherical wave-front of light: what we call the backwards and forwards light-cones.

In any Minkowski manifold, M, there is a value, S, for the distance between any two points. There are three classes of values for S within M: positive, negative and null. Each of the three possible values for the spatio-temporal distance, S, between space-time points is represented by a different feature of the light-cone model. First, space-time points that are at null spatio-temporal distance from one another are represented by the surface of both the backwards and forwards light-cones. These space-time points are said to be light-like separated because for any space-time points x and y that are at null spatiotemporal distance from one another, x can only be reached from y by a signal travelling at the speed of light.

Space-time points that are separated by a positive spatio-temporal distance are said to be 'time-like' separated. Points that are time-like separated fall on the *interior* of each other's light-cones. Time-like separations are such that for any space-time

points x and y that are time-like separated, x can be reached from y by a signal travelling slower than the speed of light.

Space-time points that are separated by a negative spatiotemporal distance are said to be 'space-like' separated and are represented by the area outside both the forward and backward light-cones. This area is a space-time point's *absolute elsewhere* and is such that for any space-like separated points x and y, x can only be reached from y by a signal travelling *faster* than the speed of light. Thus, since no causal influence can travel *faster* than the speed of light, there can be no causation between space-like separated space-time points.

Importantly, space-time points that fall on either the interior or the surface of x's light-cone can be further divided into two categories. On the one hand, all observers in all inertial frames of reference will agree that events that occur at space-time points that are on x's *backward* light-cone occur *before x*. As such, the class of events that are on x's backward light-cone are in x's *absolute past*. On the other hand, all observers in all inertial frames will also agree that the events on x's *forward* light-cone occur *after x*. As a consequence, we call x's forward light-cone x's *absolute future*.

Now, strictly speaking, an eternalist world need not be a world in which space and time are combined to form a four-dimensional spatio-temporal manifold. However, a world in which there is a Minkowskian space-time ought to count as an eternalist world and, one might argue, the manner in which we have stated Ontic Component (4) does not do justice to this fact. In so far as this is a concern, we suggest the following modification of the ontic component:

Ontic Component (5): w is an eternalist world only if (A) w is such that for every time t that exists in w, there is a set S of times $t_1,..., t_n$ such that at every t, all and only the members of S unrestrictedly exist or (B) w is such that for every space-time point p that exists in w, there is a set S^* of space-time points p1,..., pn such

that at every p, all and only the members of S* unrestrictedly exist.[29]

Ontic Component (5) explicitly accounts for eternalist worlds in which there are space-time points and worlds in which there are times and thus it captures the onto-logical foundations of eternalism, at least as that component is generally understood. It is important to note, however, one potential deficiency of Ontic Component (5). In framing Ontic Component (5) by appealing to *times* or *space-time* points one must presuppose that eternalist worlds are worlds in which there is temporality. However, this assumption may be false: it is an open question whether a world in which there is no time nevertheless counts as an eternalist world. Thus, although Ontic Component (5) captures the ontological foundations of eternalism as it is most commonly developed, we will have reason to revisit the ontic component of eternalism in Section Four, where we discuss the possibility of *timeless* eternalist worlds.

Before proceeding to a discussion of the B-series component of eternalism, there is one final issue that it is worth commenting on. An eternalist world is often called a block universe. There are, we think, two possible things that one might mean by calling an eternalist universe a block universe. The first is that eternalist worlds are worlds in which there is a four-dimensional spatio-temporal manifold. If this is what is meant, however, then it would be a mistake to suppose that "eternalist world" and "block universe" are interchangeable phrases. This is because there are perfectly good eternalist worlds in which there is no such thing as space-time (such worlds are, perhaps, worlds in which relativistic mechanics is false).

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[29] It is worth noting that none of these construals of the ontic component rule out presentist worlds as being ones that meet this particular component. So long as the set of times S in question can be a singleton set of a single time, then a presentist world meets ontic component (5). Since this component is only part of a necessary condition for counting as an eternalist world and not a suffcient condition this is as yet not a problem. We revisit this issue later.

The second thing one might mean by calling eternalist worlds block universes concerns the geometry of the universe. Roughly, on this view a block universe is one in which space-time does not have any intrinsic, mean curvature. Rather, space-time is, roughly, Euclidean. Again, we think it would be a mistake to identify eternalist worlds with block universes in this sense. This is because there is a range of solutions to Einstein's field equations (roughly, the equations that describe the gravity of a space-time based on the distribution of matter and energy) in which the space-time has some curvature, imbuing it with a different geometric and topological structure to a Euclidean space-time. These worlds, we think, are perfectly good candidates to be eternalist worlds: the geometric features of the universe are not essential to the characterisation of eternalism.

3. The B-series: Sophisticated vs. Basic

The second component to a definition of eternalism is some sort of commitment to the *B-series*. The B-series is a series of times[30] ordered by the relations of *earlier than*, *later than* and *simultaneous with* such that these relations are not subject to change ([McTaggart 1908], p. 458). That is, if for any two times t and t*, if

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[30] One might also construe the B-series as an ordering of objects/events rather than times. Whether or not one chooses to construe the B-series in this manner depends, we think, on whether on is a *substanti¬valist* about time or whether one is a *relationist*. Ifoneisa *substantivalist* one believes that time exists *independently* of the objects/events in time. If one is a *relationist*, however, then one thinks that all there is to time is the relations between objects and events. Clearly, if one is a relationist then a B-series ordering of objects/events is to be preferred whilst, if one is a substantivalist, one will prefer to construe the B-series as an ordering over times. Unfortunately, the debate between substantivalism and relationism is well beyond the scope of this paper. As such, since most eternalists seem not to be relationists, we will construe the B-series as an ordering of times rather than objects/events. However, everything we have to say about eternalism can, if one wishes, be recast using objects/events rather than times without loss.

t is earlier than t^*, t cannot 'change' its position in the B-series in such a manner that it becomes later than t^*, say. At a first pass then, let us say that:

B-series component (1): *w* is an eternalist world only if *w* is a world in which there is a B-series.

The basic form of the B-series employed in eternalism is usually thought to have at least three further features: First, the B-series is thought to be a *linear* ordering. Second, the B-series is usually thought to have an in-built asymmetry: the series runs *from* the beginning of the universe *to* the end of the universe and not *vice versa* (the clearest manifestation of this asymmetry is in the causal ordering of events across the B-series: for any *x* and *y* such that *x* is *earlier than y*, *x* can *cause y* but not *vice versa*). Third, the B-series is thought to be *unique*: there is only *one* B-series in a basic eternalist world.

Let us call the combination of these three B-series features *the simple B-series*. Further, let us call any world that satisfies the ontic component of eternalism and which is one in which there is a simple B-series, a *simple eternalist world*. Finally, let us call the view *simple eternalism*, which takes the simple B-series to be an essential feature of eternalism and thus characterises the B-series component of eternalism as follows.

B-series component (2): *w* is an eternalist world only if w is a world in which there is a simple B-series ordering of events.

For the simple eternalist, all eternalist worlds are simple eternalist worlds. For those eternalists for whom the simple B-series is not an essential feature of eternalism, the simple eternalist worlds are a proper subset of the eternalist worlds.
  As we relax which of these three features of the simple B-series we take to be essential to eternalism we get progressively more sophisticated version of eternalism. Consider, first, *uniqueness*. The B-series is unique in *w* if there is just *one* B-series in *w*. However, if one considers the actual world with respect to this further

constraint, one already finds reason to be sceptical. Both the special and general theories of relativity entail the existence of *multiple* B-series orderings, each of which is equally correct. One can see why by focusing on the special theory of relativity (henceforth STR). As already noted, according to STR the spatial and temporal distances between events are not absolute. Rather, spatial and temporal distances turn out to be relative to an inertial frame of reference. So, for example, suppose that we have two events: E and E^*. Suppose further that there are two observers O1 and O2 such that O1 and O2 are in constant motion relative to one another. According to STR, if E and E^* are simultaneous for O1 then they will be non-simultaneous for O2: the B-series ordering of the two events differs between the two frames of reference. But here's the rub: both frames of reference (O1's vs. O2's) are on a par according to STR (and general relativity). In particular, the laws of nature are the same in both frames of reference and the speed of light is constant across reference frames. Thus, there is no physical basis upon which to mark off one B-series ordering of events as the 'correct' ordering. Thus, there are multiple, equally good B-series orderings available.

Since eternalists usually take the actual world to be an example of an eternalist world par excellence and since the actual world is a world in which STR holds, this either provides us with good reason to reject the uniqueness component as being part of the characterisation of the simple B-series, or it gives us reason to reject the idea that the simple B-series is an essential component of eternalism.[31]

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[31] Indeed, one might go further and wonder how seriously we should be taking the B-series. In particular, one might think that due to the *perspectival* nature of the B-series (i.e. each ordering is relativised to a particular perspective: an inertial frame of reference) the metaphysical robustness of the B-series has been thinned down. To see the idea here consider the following: suppose that we have before us two moral views. On the one hand, there is a view according to which there is just *one* set of moral facts. On the other hand, we have a view according to which there are *multiple* (and incommensurate) sets of moral facts, each of which is equally good (perhaps the facts are relativised to cultures, nations or individuals). Although in both cases we have moral facts, one might be in-

Consider now *linearity*. It is usually assumed that an eternalist world is one in which there is a linear topology. But again, it is unclear that one ought to take the linearity component of the simple B-series to be essential to a characterisation of eternalism, for there are many other possible topologies. These include closed topologies in which there are closed time-like curves: curves in space-time such that an object travelling forward in its personal time will end up back in time meeting its earlier self. A *Gödel world* is a world like this: a constantly rotating world in which the very same, numerically identical event is both the 'start' and 'finish' of a particular temporal sequence.[32] For such a sequence of events, there is no consistent linear ordering. That is because, we suppose, a linear ordering is one in which, minimally, the irreflexivity of the earlier-than and later-than relations is preserved.

There are also topologies in which time fails to be unified. Unification is the temporal analogue of connectedness in space. A region of space is connected just in case for any two spatial locations, there is a spatial relationship between those locations, or, as we might say, in case there is a continuous spatial path joining the two. Two temporal locations are unified just in case there is some temporal relation between the two, that is, just in case relative to *some* frame of reference, any temporal locations t_1 and t_2, t_1 is either earlier than t_2, or later than t_2, or t_1 and t_2 are simultaneous. We can also define a disunified *space-time*. A disunified space-time is a space-time in which the manifold itself splits in two, producing

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clined to think that there is a difference in strength between the two views. Accepting that there are many, equally good moral views is, one might think, to take moral facts 'less seriously' than if one were to accept that there is just *one* moral view. This applies also to the B-theory: having many, equally good B-series is to take the ordering at issue 'less seriously'. Even if this is correct, however, we have little choice: the physics demands that we give up the basic form of the B-theory and endorse a more sophisticated and, perhaps, metaphysically *weaker* form of that view according to which there are many, equally good B-series in the world.

[32] Gödel worlds are space-times that are characterisable by Kurt Gödel's solution to Einstein's field equations. For further discussion of Gödel worlds see [Bourne 2006].

two 'branches' of space-time such that there is no direct space-like, time-like or light-like connections between points on the two branches (of course, there are *indirect* connections between the points, it is not as though the two branches constitute *distinct* space-times).

Now, it is not clear to us why a disunifed world ought to fail to count as an eternalist world or, indeed, why a Gödel world should fail to be an eternalist world just because the B-series is non-linear in such a world. So in both cases, we think, there is pressure to reject the simple B-series as an essential feature of any eternalist world.

Finally, consider *asymmetry*. That the B-series is asymmetric is also, we think, inessential to a characterisation of eternalism. For example, one might defend a view according to which there is no sense in which the B-series runs *from* the start of the universe *to* the end of the universe. Rather, the B-series simply ties the two ends of the universe together with no regard for directionality[33] (a view along these lines is developed and defended by Huw Price in [Price 1997]). Alternatively, one might accept that there *is* asymmetry but that it runs in the *opposite* direction: moving *from* the end of the universe back towards the beginning of the universe. Finally, one might think that we live in a *Gold* universe (so-called after Thomas Gold the cosmologist who proposed the model in the 1960s). Strictly speaking a Gold universe is one in which the universe begins with a big bang, expands with increasing entropy for some time until it starts to contract and entropy then decreases until it reaches a low entropy state and ultimately a big crunch. If one thinks of the direction of time as being grounded in some way in the thermodynamic arrow, then a Gold universe is one in which the B-series runs in one direction until time t at which time it reverses direction. More accurately, one can think of a Gold universe as a

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[33] One might think that the irreflexivity of the earlier-than and later-than relations follows from the failure of asymmetry. However, this is incorrect. One can have a world in which temporal relations failure to have a direction at all without those relations needing to be reflexive.

universe in which there are *two* B-series running in opposite directions from the two ends of the universe, meeting somewhere in the middle.

There is a cluster of different eternalist views on offer depending on which combination of these features of the simple B-series one rejects as being essential to eternalism. We will not consider each of these here. Rather, we distinguish only two, which we call standard sophisticated eternalism and weak sophisticated eternalism respectively. Standard sophisticated eternalists reject as essential to eternalism just the uniqueness component of the simple B-series. Thus they hold that there are eternalist worlds in which there are many equally good B-series orderings, one for each inertial frame of reference. But there are no eternalist worlds in which there are B-series orderings that are non-linear or symmetrical. We can thus characterise the B-series component of eternalism according to the standard sophisticated eternalist as follows:

B-series component (3): *w* is an eternalist world only if there is a B-series ordering of times in *w*, and the ordering of those times is both linear and asymmetric.

We call this view *standard* sophisticated eternalism because, as a sociological matter of fact, we think this is the view that most eternalists hold. This is in contrast to weak sophisticated eternalists who reject the uniqueness, linearity and asymmetry constraints and thus are committed only to the following B-series component of eternalism:

B-series component (4): *w* is an eternalist world only if there is at least one B-series ordering of events in *w*.

It is worth noting at this point that nothing we have said so far in characterising eternalism precludes there being eternalist worlds in which there is, in addition to a B-series, also an A-series. We consider this issue further in the following section. For now, however, we should point out that again, as a sociological matter of fact, *standard sophisticated eternalists* either hold that necessarily,

there is no A-series, or at the very least, that for every eternalist world *w*, there is no A-series in *w*.

4. The B-series: Flow?

In the previous section we drew a distinction between simple eternalism and two versions of sophisticated eternalism. In this section we draw a further distinction between two different kinds of eternalism that we will call inclusive and exclusive. So far, we have assumed that eternalists take the existence of the B-series in a world to be necessary for that world to be an eternalist world. But the existence of a B-series in a world does not preclude the existence of an A-series in that world. The A-series is, like the B-series, a temporal ordering. The A-series, however, orders times based on whether they are past, present or future – rather than earlier than, later than or simultaneous with some other position – ([McTaggart 1908], p. 458). Unlike the B-series, the A-series is subject to change. In particular, positions in the A-series change from being future to being present to being past. This change is usually identified with the flow of time.

Let us call the B-series *exclusive* just in case necessarily, for any world *w* in which there is a B-series, there is not also an A-series. Let us call the B-series *inclusive* just in case it is not the case that necessarily, for any world *w* in which there is a B-series, there is not also an A-series. Then we now have two amended versions of each of the competing B-series components ((1) through (4)) mentioned in the previous section corresponding to whether we take the B-series in question to be exclusive or inclusive. However, since we are focusing on *sophisticated eternalism*, the more important of these would then be:

B-series component (3a): *w* is an eternalist world only if there is an exclusive B-series ordering of events in *w*, such that the ordering of those events is both linear and asymmetric.

B-series component (3b): *w* is an eternalist world only if there is an inclusive B-series ordering of events in *w*, such that the ordering of those events is both linear and asymmetric.

B-series component (4a): *w* is an eternalist world only if there is an exclusive B-series ordering of events in *w*.

B-series component (4b): *w* is an eternalist world only if there is an inclusive B-series ordering of events in *w*.

(3a) represents the strongest construal of the B-series component that we will consider and (4b) the weakest. As we understand matters, most philosophers who self ascribe as eternalists accept something closer to (3a) than any of the other three ways to construe the B-series component. Notable exceptions to this are those who reject the exclusivity of the B-series and thus adopt either (3b) or (4b).

It is important to point out at this junction that there are two very different models of time compatible with both (3b) and (4b). These models differ over how one conceives of the A-series. Specifically, they differ over whether or not the A-series itself is taken to be *unique*.[34] If the A-series is *unique*, then there is a single way of ordering times in terms of whether they are past, present or future. On such a view the flow of time captured by the A-series is conceived of as a universe-wide 'wave'. This view accords with the *Moving Spotlight* or *Hybrid* view of time.[35] Or, more carefully, according to an eternalist who accepts the inclusivity of the B-

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[34] As well as uniqueness, one might also think of the A-series in terms of linearity. Specifically, just as one might relax the assumption of uniqueness, one might also construe the A-series as non-linear (think of a moving present that travels in a loop). Note, however, that the A-series is usually thought to be asymmetrical and, furthermore, that this seems to be an *essential* feature of the A-series. If the A-series is not asymmetrical then the flow of time has no *direction*. However, having a particular directionality would seem to be essential to temporal flow.

[35] The moving spotlight theory of time is discussed in [McKinnon 1999], [Skow forthcoming], and [McTaggart 1908].

series, the Moving Spotlight and Hybrid worlds are to be classified as *eternalist* worlds despite their having an A-series. Worlds that lack an A-series (if there are any) and meet the B-series component and the ontic component will, of course, also count as eternalist worlds.

If, however, the A-series is *non-unique*, then there is no single way of ordering times in terms of whether they are past, present or future. Rather, there are many, equally good orderings of this kind. The flow of time, on this view is more like a system of capillaries, with numerous 'channels' down which there can be a moving present.[36] Either of these ways of thinking of the A-series is consistent with both (3b) and (4b). Even in a world in which the B-series is non-linear, asymmetric and non-unique, (as if (4b) holds) one can suppose there is a unique A-series in virtue of there being a unique *metaphysically* privileged frame of reference that determines the A-series, though no unique *physical* frame that determines a unique B-series.[37]

Whether or not an eternalist takes the B-series component of eternalism to require an exclusive B-series or merely an inclusive B-series depends on a couple of factors. First, clearly, it depends on whether she thinks that there are any possible worlds in which there is an A-series, and thus any worlds in which there is both an A-series and a B-series. If one holds that the A-series is internally inconsistent and hence impossible, then one ought to reject inclusivity in favour of exclusivity. If one countenances the existence of worlds with an A-series and a B-series, then the question remains as to whether those worlds ought to count as *eternalist* worlds or not and thus whether or not to embrace inclusivity in the B-series.

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[36] The central question for such a view is whether or not the *uniqueness* of the A-series really is up for grabs. One reason for thinking that it is not is that there is supposed to be something *special* about the objective present. However, if there are multiple objective presents to be had then *prima facie* it may be hard to do justice to the idea that the present is metaphysically special.

[37] A view along these lines is defended by Craig Bourne in [Bourne 2006], p. 183.

If one thinks it is essential to a characterisation of eternalism that eternalist worlds lack an A-series, then one will reject any worlds with an inclusive B-series as being eternalist worlds even while admitting that there are such worlds. If, however, one thinks that such worlds are eternalist worlds, then one will embrace the somewhat weaker inclusive characterisation of the B-series component of eternalism.

Of course, it is consistent with the inclusivity of the B-series that *every* world with a B-series also has an A-series (rather than merely some of them). Indeed, if one were an eternalist who supposed that the A-series is essential to the existence of temporality, then one would either embrace the inclusivity of the B-series (and take it that every eternalist world has both a B-and an A-series) as a component of eternalism or adopt an error theory about temporality (if one thinks that the A-series is internally inconsistent *à la* McTaggart ([McTaggart 1908], pp. 467-470).This, however, is unlikely to be true of any eternalist we know, since as a matter of fact, most eternalists think that the A-series is *not* essential to the existence of time. Thus, most eternalists think that time does not (and in the case of many eternalists, *necessarily* does not) flow in any meaningful sense.

Note, though, that the spectre of being error theoretic about temporality raises some further interesting questions about the role of the B-series in a characterisation of eternalism. The various B-series components that we have considered above yield characterisations of eternalism according to which *some* kind of B-series is essential to a world's counting as an eternalist world. In the following section we consider whether any satisfactory characterisation of eternalism must include a B-series component.

5 The B-series: Limiting Cases

Consider a world in which there is a single three-dimensional *slice*: a three-dimensional 'snapshot' of the world at a time. Call such a world a W_1-type world. Is a W_1-type world an eternalist world? On

the face of it, a W_1-type world is *not* a world in which there is a B-series. This is because in order for there to be a B-series in a world there must be some irreflexive relations of earlier-than and later-than in that world (even if all of these relations are not irreflexive, as in a Gödel world). However, *prima facie* there are no such relations in a W_1-type world. For there is only a single time in such a world, and all events/objects in that world exist at that one time.

Here's a very quick argument for the view that a W_1-type world is an eternalist world. Suppose, for a moment, that the actual world, $W_@$, is a *simple* eternalist world: a world in which there is a single B-series. Such a world can be conceptualised as a 'stack' of three-dimensional 'slices'. Now, imagine that we produce a second world, W_a, by taking just *one* of the slices away. Is W_a an eternalist world? On the face of it, the answer appears to be 'yes'. This is because, intuitively, the loss of a single temporal slice cannot make the difference between whether a world is an eternalist world or not. But suppose that we produce another world, W_b, by taking a slice from W_a. Is that world an eternalist world? Again, the answer seems to be 'yes'. The trouble is that we can keep taking slices away to produce new worlds. But if the presence/absence of a single slice can never make the difference between whether or not a world is an eternalist world, then by following the same sorites-style reasoning, we can construct a simple eternalist world by taking a world in which there are only two three-dimensional slices and removing one of those slices.

You don't need to take sorites style arguments seriously to wonder whether, if a two-slice world is an eternalist world, then a one-slice world is also an eternalist world. Whether one finds it plausible that removing a single slice will not make the difference between a world being an eternalist world and not being an eternalist world ultimately depends on whether one thinks that necessarily, any eternalist world has a B-series. For the only relevant difference being made by the removal of a single three-dimensional slice from a world in which there are two such slices is that removing a slice strips that world of any relations of earlier-than and later than. Hence, if one's intuition is that the conclusion of the sorites

style argument is false, this reveals that one considers the B-series to be essential to a characterisation of eternalism. Mutatis mutandis if one thinks that the argument goes through.

A similar line of reasoning can be applied to *sophisticated* eternalism. In that case, however, rather than thinking in terms of a single three-dimensional slice, it is more useful to think in terms of space-time points. The usual way of thinking about a sophisticated eternalist world is as a four-dimensional manifold, the positions in which have both a *spatial* and *temporal* component. Such a manifold is, essentially, a Minkowski space-time. In Minkowski space-time the issue of what counts as a limiting case of an eternalist world may not revolve around consideration of a world with just one three-dimensional slice. For it only makes sense to talk of a three-dimensional 'slice' from within a frame of reference. This is because there is no frame-invariant way to 'slice up' the manifold into three-dimensional slices in this manner. Rather, there are equally many good ways to carry out such a slicing (this is, really, just another way of saying that there are equally many good B-series orderings in Minkowski space-time).

However, this has the following consequence. Consider a one-slice, sophisticated eternalist world. In such a world, there is a frame of reference, R_1, in which all of the events that exist in the slice are simultaneous. There are, however, many frames of reference in which the events in question are not all simultaneous with one another. For example, there is a frame of reference R2 in which some of the events stand in earlier-than or later-than relations with one another. If this is correct, however, then such a world is not, strictly speaking, a world *without* a B-series. At best, it is a slightly impoverished sophisticated eternalist world in which there is one *less* B-series ordering than there would usually be.

As such, the interesting case will be to consider whether a world with a *single* space-time point counts as an eternalist world. We arrive at such a world by progressively removing space-time points from the manifold of a sophisticated eternalist world. Here again, a world with a single space-time point is *not* a world in

which there is a B-series. For consider, a single space-time point decomposes into a *spatial* and a *temporal* component. Thus, in such world at best all that exists is a single *spatial location* and a single *temporal location*. But a single temporal location is not sufficient for the existence of any B-relations of earlier-than and later-than (regardless of one's frame of reference). This is because these relations can only ever hold between distinct temporal locations.

Since worlds that are paradigmatically considered to be eternalist worlds do have a B-series, it is unsurprising that intuitions might differ with respect to these worlds that are either limiting cases of eternalist worlds (if one thinks the B-series is non-essential to eternalism and thus rejects the various B-series components altogether) or worlds that are not eternalist worlds at all (if one thinks the B-series is essential to eternal-ism and thus accepts some version of the B-series component). That people turn out to deploy somewhat different concepts, all under the name "eternal-ism" is certainly worth noting. It is not obvious which of these concepts is the best or most natural one. One thing that seems right to us, however, is that the weaker one's conception of the kind of B-series that is essential to eternalism, the more unstable one's position and the more likely to collapse into a position according to which there is no essential B-series component to eternalism. Once one allows that the only kind of B-series that is essential to eternal-ism is one that does not require uniqueness or linearity or asymmetry or a particular kind of topology, then it is more difficult to resist the final move according to which the B-series is not essential to eternalism at all. For the sense of "temporality" and "tense" that one can extract from worlds with such B-series are already very unlike our ordinary everyday sense of these concepts. On the other hand, it is very easy to see how to resist such a move if one embraces something like B-series component (2) or B-series component (3a). For the difference between a world with no B-series such as the one slice world or the one space-time point world, and a world that is characterised by (2) or (3a) is radically different in kind.

So it may be that eternalists are faced with something of a dilemma. On the one hand, they can accept a very "meaty" conception of the nature of the B-series, and take that series to be essential to eternalism. But the worry about this is that it is very doubtful that the actual world would then turn out to be eternalist given what we now know about its physics. On the other hand, the eternalist can accept a more liberal conception of the B-series. But once she does that, it becomes more difficult to see a way to draw a principled line that rules in as eternalist worlds only those worlds with such a B-series, and rules out worlds that lack any such series.

Let us call the view that the B-series (in any form at all) is inessential to eternalism an atemporal conception of eternalism. If one is an atemporal eternalist, then one is faced with some extra work. For the atemporal eternalist rejects all of the B-series components. Thus they define eternalism entirely in terms of the ontic component. But the ontic components we have offered will simply not do the job. Consider the most sophisticated of these, Ontic component (5):

Ontic Component (5): w is an eternalist world only if (A) w is such that for every time t that exists in w, there is a set S of times $t_1,..., t_n$ such that at every t, all and only the members of S unrestrictedly exist or (B) w is such that for every space-time point p that exists in w, there is a set S^* of space-time points $p_1,..., p_n$ such that at every p, all and only the members of S^* unrestrictedly exist.

Intuitively, in an atemporal eternalist world clause (A) may not obtain, since there are might be no times in such a world. But likewise, clause (B) will also fail since if there is no temporality in a world, it is hard to see how there could be space-*time* points. As such, what we need is a form of the ontic component that leaves open the possibility that the universe might consist of some *space* of *points* such that there are no temporal or spatio-temporal metric relations of any kind between those points but nevertheless, in typical eternalist style, all of the points *exist* unrestrictedly. Since the ontic component is now the only component that defines eternalism, we are looking for a definition that gives us both necessary and sufficient conditions for a world's being eternalist. As a first

pass we might modify Ontic Component (5) along the following lines:

Ontic Component (6): *w* is an eternalist world if only if (A) *w* is such that for every time *t* that exists in *w*, there is a set *S* of times $t_1,..., t_n$ such that at every *t*, all and only the members of S unrestrictedly exist or (B) *w* is such that for every space-time point *p* that did, does or will exist in w, there is a set S^* of space-time points $p_1,..., p_n$ such that at every *p*, all and only the members of S^* unrestrictedly exist or (C) w is composed of a space C such that (i) at every point p^* in C that exists there is a set S^{**} of points $p^*_1,...,$ p^*_n such that at every p^*, all and only the members of S^{**} unrestrictedly exists, and (ii) there are no temporal or spatio-temporal metric relations between points in C and (iii) the points of C have spatial dimensions only.

It is useful to consider some examples of atemporal worlds that meet clause (C). Suppose that the space *C* is a *configuration space*: roughly, a space that describes all of the physically possible configurations of some physical system *P*. More specifically, suppose that *C* is a configuration space for all of the particles in the universe. The points in *C* will thereby be three-dimensional arrangements of those particles. Such arrangements accord with what we might think of as *times*. However, in a configuration space there need not be any temporal or spatio-temporal metric relations between the points in that space. So we need not think of the points in *C* as times (or, indeed, space-time points), even though that is what they look like. A configuration space of this kind satisfies (C), and as such there are two kinds of world that will count as eternalist given ontic component (6). First, an eternalist world *w* might be such that (a) *all* of the physical possibilities are realised and (b) there are no metric relations between points in *C* (although the points themselves are constituted by spatial metric relations between the particles being configured) and (c) the points in *C* have spatial dimensions only. Second, an eternalist world *w* might be such that (a) *all* of the physical possibilities are realised and (b) although there are no temporal or spatio-temporal relations be-

tween points in *C*, there are spatial metric relations between points in *C* and (c) the points in *C* have spatial dimensions only.

   Call the first kind of world an *atemporal Barbourian eternalist* world (Barbourian because this is very close to a description of what Barbour thinks our world is like, more on this below). Call the second kind of world an *atemporal hyper-eternalist* world. The difference between these two worlds concerns the metric relations between points in the configuration space. In the Barbourian world the points in the space 'float free' of one another; they are spatially and temporally isolated. In the hyper-eternalist world, by contrast, the points are connected via a *fourth* purely spatial dimension (hence, such a world is a world in which there could be four-dimensional objects, such as Klein bottles or Tesseracts). Note that there are a large number of hypereternalist worlds compatible with clause (C). This is because there is no limit to the spatial dimensions of the points in a configuration space. Thus, if we start with three-dimensional points, then a hyper-eternalist world will be four-dimensional. However, if we start with four-dimensional points (where all of the dimensions are spatial as per (iii) in clause (C)) then a hyper-eternalist world will be five-dimensional. More generally we can say that for any configuration space in which the points are *n*-dimensional, a hyper-eternalist world will have *n* + 1 spatial dimensions.

   Which of these versions of atemporal eternalism is to be preferred depends upon how uncomfortable one is with the idea that the points in *C* bear no metric relations to one another. For if there are no metric relations between the points, then they are spatially and temporally isolated, even though they exist. As such, one might be inclined to think that Barbourian eternalism is really a form of *concrete modal realism*: the view according to which there are spatially and temporally isolated universes.[38] This is because, given the lack of metric relations between points in *C*, those points

[38] Though of course, this is a concrete modal realism in which only the physically possible worlds exist, at least in that particular configuration space.

might seem to be distinct three-dimensional worlds. Thus, in so far as one is worried about atemporal worlds collapsing into modal realism one should prefer the hypereternalist alternative.[39]

At this point one might worry about using configuration spaces to define eternal-ism. This is because eternalist worlds that meet clause (C) will be worlds in which all of the physical possibilities are realised. Or, rather, such worlds are worlds in which all of the possible n-dimensional configurations of the world are realised (in some cases: in $n + 1$ dimensions). But an eternalist who rejects the existence of time need not be committed to the view that all of the physical possibilities are realised.

In response, one might try to find some other space to define clause (C). The trouble with this, however, is that the spaces to which one might appeal are, as with the configuration space, spaces of *possibility*. For example, one might appeal to an n-dimensional Hilbert space. However, Hilbert spaces, like configuration spaces, are possibility spaces. An alternative option for responding to this worry then might be to define an eternalist world as some *sub-set* of points in the relevant space (rather than the set of all points). This suggests the following modification to Ontic Component (6):

Ontic Component (7): w is an eternalist world if only if (A) w is such that for every time t that exists in w, there is a set S of times $t_1,..., t_n$ such that at every t, all and only the members of S unrestrictedly exist *or* (B) w is such that for every space-time point p that did, does or will exist in w, there is a set S^* of space-time points $p_1,..., p_n$ such that at every p, all and only the members of S^* unrestrictedly exist *or* (C) w is composed of a set of points S'

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[39] One might think that the isolation of points in an atemporal eternalist world is simply an artefact of using *configuration spaces* to meet clause (C) and that if some other space is used, then the points in the relevant space will be less isolated. However, this is mistaken: the isolation is due to the fact that there are no metric relations between points in atemporal eternalist worlds and not due to any intrinsic feature of the configuration space itself.

in some space C such that (i) at every existing point p in S' there is a set S^{**} of points $\square$,..., $\square$ such that at every p^*, all and only the members of S^{**} unrestrictedly exists and (ii) there are no temporal or spatio-temporal metric relations between points in S' and (iii) the points of C have spatial dimensions only.

Barbourian eternalist worlds, then, are worlds in which the points in S' bear no metric relations to one another. Hyper-eternalist worlds, by contrast, are worlds in which the points in S' bear spatial metric relations to one another only. The upshot of defining atemporal eternalist worlds in this manner is that S' need not contain all of the points in C. So the atemporal eternalist need not be committed to the view that all of the physical possibilities are realised in any atemporal eternalist world.

6. Fundamentality

In this section we consider a further, interesting question about how the eternalist should construe the relationship between the B-series and eternalist worlds. This is the question of the *fundamentality* of the B-series. Here there seem to be two options open: the eternalist might suppose that the B-series is fundamental, or that the B-series is emergent (or supervenient, or derivative). Notice that even an eternalist who rejects the contention that the B-series is essential to eternalism, will likely hold that some eternalist worlds have a B-series, and thus ought to be interested in the nature of that B-series.

Exactly what it takes for some x to be fundamental is in itself debatable.[40] It might be that x is fundamental iff x is its own super-venience base. Or it might be that x is fundamental iff the theory that posits x cannot be reduced to any more fundamental theory. Or it might be that x is fundamental just in case there is nothing that x depends upon. One way we might try to determine what is funda-mental is by looking at the objects posited by our best physical

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[40] See [Schaffer 2009] for a detailed discussion of these issues.

sciences, and in particular, by looking at the objects posited by our fundamental theories. One might be tempted to suppose that if our most fundamental theories posit the existence of an entity E, then this is good reason to suppose that E is fundamental in at least one of these senses, and that if they fail to posit E, that is reason to suppose either that E does not exist, or that E is derivative on some more fundamental entities.

In looking to the question of whether the B-series is fundamental or derivative, there are two related questions. Since the B-series is a temporal series, the first is the question of whether time itself is fundamental or derivative. If time itself is derivative, then this answers the question about the fundamentality or not of the B-series. On the other hand, if time itself is fundamental, this leaves it open that the B-series might be either fundamental or derivative, since it leaves it open that, for instance, the A-series might be fundamental and the B-series derivative or that some other temporal phenomenon might be fundamental and the B-series derivative. We think it implausible that a world counts as eternalist in which there is a fundamental A-series and a derivative B-series. That leaves it open, however, whether there are versions of eternalism in which the B-series is fundamental, and versions in which it is derivative (but not on the A-series).

The usual assumption is that time is in some good sense fundamental. Sometimes this is expressed as the claim that our world is fundamentally a four-dimensional one, and that although space and time are interwoven in a complex manner, there is a time-like dimension in the four dimensions and that this is important. Sometimes this is expressed in the thought that fundamental physical theory is characterised with the use of a 't' parameter, and therefore that this temporal parameter must be fundamental. Not everyone agrees with this, however. For instance, Julian Barbour ([Barbour 1999]) has an interpretation of canonical quantum gravity the first part of which involves reformulating classical general relativ-

ity in a Machian manner.[41] Leaving the details aside, the idea is that a Machian formulation of general relativity has no variable that represents time. This is not to say that given such a formulation it makes no sense to speak of temporality. For there is a sense in which we can *recover* or perhaps better, *reconstruct*, a temporal ordering, and hence time, from such a formulation. It is just that time is not a fundamental component of the theory. While Barbour represents this view as temporally eliminativist, it is better, we think, to understand his formulation of general relativity as instead being one in which time is not fundamental, and thus one in which the B-series is not fundamental, but instead is derivative.

Barbour's Machian formulation of general relativity, if correct, would give us reason to think that the B-series is *not* fundamental in our world. The question then is whether or not such a world is an *eternalist* world. Our view of the matter is that if a B-series ordering can, in some good sense, be reconstructed from the fundamental posits then there is a B-series ordering in the world and so even those who suppose that a B-series is essential to a characterisation of eternalism ought to think that such a world counts as being eternalist. However, we recognise the possibility of a more hard-line eternalist view, what we will call *serious* eternalism. Serious eternalism is the view according to which a B-series ordering is not only essential to any eternalist world, but in addition such an ordering *must* be fundamental.

There is an interesting question here as to whether the B-series is fundamental in a more standard picture of the nature of space-time, let alone Barbour's Machian general relativity in which the fundamental posits are points in *configuration* space. On the face of it, the fundamental posits of Minkowski space-time are the space-time points along with the relations between them which define their connectedness. Of course, one can impose a B-series ordering onto the manifold from *within* an inertial frame of reference. To do this, one 'slices' or *foliates* the manifold into a series

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[41] For further discussion of Barbour's view see [Baron, Evans and Miller 2010], [Healey 2002] and [Ismael 2002].

of three-dimensional slices, which can be thought of, roughly, as times, and which are related to one another by earlier-than/later-than relations. But there is no sense in which that B-series ordering is the 'correct' ordering: there are many equally good ones. In the current context, we can see this as the claim that there is no B-series ordering that is *fundamental* to the universe. Rather, there are many equally good ones that supervene on the space-time points.

Regardless, if Barbour is correct then worlds will count as having a B-series, but will do so despite being very unlike our intuitive picture of a world with temporality. It is these sorts of considerations that, we think, push the eternalist either towards a very strong definition of eternalism, or push the eternalist towards jettisoning the idea that the B-series is essential to eternalism (though of course, many eternalist worlds will be ones with a B-series). As we noted earlier however, the space of eternalist worlds that correspond to a very strong definition of eternalism is very limited indeed: only those worlds in which there is a unique B-series ordering. But that would seem to rule out even the actual world as being an eternalist world.

Returning to the issue of temporality, it is worth noting that both Barbour ([Barbour 1994a], [Barbour 1994b], [Barbour 1999]) and Deutsch ([Deutsch 1997]) each have a theory of quantum gravity that is timeless in a much stronger sense: the B-series is neither fundamental nor, they claim, derivative. For example, Barbour claims that there is no unique way our world was in the past, nor will be in the future: there is just a static configuration space filled with three-dimensional 'instants' and there is no path through that space that can rightly be thought as a history of a world. Thus there is simply no temporal ordering in Barbour's interpretation of quantum gravity. Again, we set aside the details of Barbour and Deutsch's quite distinct proposals, and merely note that if there are possible worlds that are as they describe, then there are possible worlds in which there is no B-series, either fundamental or derivative, and if Barbour and Deutsch are right, those worlds might seem very much like our world (indeed, our world might be such a

world). Once again, whether such worlds count as eternalist ones will depend on whether one takes the B-series to be essential to eternalism.

7. Presentism and Eternalism: Indispensability

Thus far we have considered the three main components of eternalism: the ontic component, the B-series component and the fundamentality component. We provided a precise characterisation of the ontic component, identified a number of different forms of eternalism that stem from being committed to different B-series components, and we argued that eternalists should not be *serious* eternalists; that is, they should not think that the B-series is fundamental, except in the sense that it should not be derivative on the A-series.

We turn our attention now to the relationship between eternalism and *presentism*. Although presentism has been previously characterised in more detail in this volume, for our purposes we will characterise presentism in the following manner.

Ontic Component of Presentism (1): w is a presentist world only if w is such that for every time t that exists in w, there is a *singleton set S* of times $t_1,..., t_n$ such that (i) all and only the members of S unrestrictedly exist and (ii) for every tn, $t = tn$.

The Ontic Component of Presentism (1) is not quite right, however. This is because, although there is only a single time that exists, the presentist maintains that there *were* past times and *will* be future times. To reflect this idea, we can modify the ontic component as follows:

Ontic Component of Presentism (2): w is a presentist world only if w is such that for every time t that exists in w, there is a *singleton set S* of times $t_1,..., t_n$ such that at every t, all and only the members of S unrestrictedly exist *and* for every time t there *were* past times and *will be* future times.

In what follows we present an argument *against* the ontic component of presentism, an argument that, to our knowledge, has not been considered hitherto. The argument takes the form of an *indispensability argument* against this ontic component, now well known from what is often referred to as the Quine-Putnam indispensability argument for mathematical Platonism.[42] The thought, in rough terms, is that the existence of *more than one time* is indispensable to our best science and so we ought to be ontologically committed to the times in question. More formally, the indispensability argument can be stated as follows:

(P1) We ought to have ontological commitment to all and only the entities that are indispensable to our best scientific theories

(P2) The existence of more than one time is indispensible to our best science

(C) Therefore, we ought to have ontological commitment to more than one time

Here, we take it that some entity E is indispensable to our best science only if there is some scientific theory T such that (i) T is a part of our best science (ii) E plays a role in T and (iii) T is *more attractive* than some theory T^* in which E does not play a role. (P2) seems plausible. A brief glance at the science will reveal both implicit and explicit quantification over times (for example in the hard sciences like physics but also in the special sciences such as biology). Thus, the onus is on the presentist, we think, to carry out a Hartry Field style 'nominalisation' of science (see [Field 1980]): she must show that the existence of multiple times is, in fact, *dispensable* to our best scientific theories. To do this the presentist must collect together all of the statements that seem to involve quantification over non-present times. Call these statements the Ss. One then *replaces* the S*s* with some class of statements that are

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[42] For detailed discussion of the Quine-Putnam indispensability argument see [Colyvan 2001].

capable of (i) playing the same role in the science but (ii) do not involve quantification over non-present times.

Here's how this might go. Call quantification over non-present times *tensed quantification*. Eternalists have an easy account of tensed quantification: tensed quantification is just restricted quantification. Presentists, however, cannot understand tensed quantification in this manner. Rather, presentists analyze tensed quantification as quantification within the scope of a non-truth-functional tense operator. So, for example, consider the claim that there existed dinosaurs in the past. According to the presentist, when translating this claim into logical form, we nest the entire quantified sentence within the sentential operator 'it was the case that' (W):

(*W*) $\exists x Dx$

The idea is that sentential operators of this kind are analogous to non-truth-functional modal operators, in that nesting a quantifier within the relevant operator undercuts its ontological force ([Sider 1999], p. 326). In the current context, then, the thought would be to replace the *Ss* with a set of propositions, the $S^{*}s$, which use truth-functional tense operators instead of restricted quantifiers.

Although we do not rule out the success of a project of this kind, we are pessimistic that one can carry out this 'nominalisation' of a scientific theory *T* without rendering that theory less attractive overall. This is so for the following reason. It is likely that the science will involve quantification over multiple times[43] such as:

(S1) There have been two times in the past at which the moon was between the earth and the sun

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[43] And indeed, may also require cross-temporal relations, which imposes further constraints on any metaphysical theory of our universe.

According to David Lewis ([Lewis 2004]), however, although tense operators are satisfactory for most purposes, *plural* tensed quantification poses a distinct challenge for parsing tensed quantification along presentist lines (see [Brogaard 2007] for a response to Lewis). For example, in order to parse (P1) the presentist nests the entire quantified sentence within a past-tensed operator:

$$(S1^{'})(W)(\exists x \exists y((Tx \land Ty \land x \neq y) \land ....)$$

But this cannot be right, for (S1$^{'}$) reads: *it was the case that* (there are two distinct times such that....). But *prima facie* this commits the presentist to the view that it was the case that there are two distinct times. But this flies in the face of presentism: it was never the case that there are two distinct times. The difficulty is that, as Lewis goes on to argue, any attempt to sophisticate the general presentist strategy requires either taking on unattractive theoretical or ontological commitments or endorsing an analysis of (S1) that has an infinitary construction. This poses a difficulty for the project of 'nominalising' science by removing apparent reference to multiple times. This is because, to complete such a project for some scientific theory T, one must render T a less attractive theory overall, by running afoul of either simplicity or parsimony.

8. Conclusion

Despite being both a popular view and, we think, a very profitable avenue of enquiry in metaphysics, we think that more attention could be paid to thinking about to what one is committed when one says that one is an eternalist. We have outlined a range of views that are, when all is said and done, very different from one another. At one end we have a very weak conception of eternalism that will include as eternalist, worlds in which points in configuration space bear no metric relations to one another. At the other end of the spectrum we have very strong versions of eternalism that demand not only that all eternalist worlds have a B-series, but in addition that such B-series' meet some quite stringent crite-

ria. We have not, by and large, attempted to adjudicate the question of which of these characterisations is the correct one, (or the most useful one) beyond noting that some of the strongest characterisations would seem to preclude the actual world from being an eternalist one, and noting that some of the weakest would allow worlds extremely unlike ours (or at least, extremely unlike the way our world is taken to be by most of us) to count as eternalist worlds. We hope that offering these characterisations fosters renewed interest in thinking about to what eternalists want and ought to be committed.

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The Triviality of Presentism

Ulrich Meyer

1. Introduction

Many philosophers believe there to be a fundamental difference between the *present* and past and future times, but they tend to disagree amongst themselves about what this difference is. Some think that the present is singled out by consciousness, while others believe that it marks the position to which the flow of time has advanced. According to presentism, the current moment is *ontologically* privileged:

(P) Nothing *exists* that is not present.

My aim in this chapter is to argue that this particular attempt at distinguishing the present from other times is unsuccessful. I hold similar views about the other proposals, but that is not something I shall argue for here.

Opponents of presentism—the so-called "eternalists"—often object that the presentist thesis (P) is incompatible with the theory of relativity, or that endorsing it would leave us unable to account for causal and other cross-temporal relations.[44] In my view, the main problem arises much earlier. The *triviality objection* to presentism contends (i) that (P) is ambiguous between different readings of the 'exists' that occurs in it, and (ii) that none of the possible disam-

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[44] Part 2 of this volume discusses these objections in more detail.

biguations succeed in saying something that is both non-trivial and true. There is no substantial metaphysical thesis that needs to be refuted by a sophisticated argument.[45]

2. The Presentist's Dilemma

In trying to understand the thesis, an obvious possibility is to read the 'exists' in (P) as the ordinary present tense of the verb *to exist*:

(P1) Nothing *exists now* that is not present.

This thesis is true, but trivial. Since being present and existing now amount to the same thing, (P1) merely notes that everything that exists now, exists now. Everybody has to accept *this* thesis, irrespective of their views about the metaphysics of time. Of course, accepting (P1) does not preclude the possibility that the present is special in some other way. For instance, if it were true that the present is singled out by consciousness then presently existing objects would be those objects that are "lit up by consciousness. " But the difference between them and past and future objects would not be ontological in nature.

Since presentists clearly intend to advance a substantial thesis about time and existence, it seems safe to assume that (P1) is not what they have in mind. So what could they mean? The apparent problem is that (P1) interprets the 'exists' in so narrow a sense that existence analytically entails presence. To get a non-trivial reading, we need a notion of existence whose definition does not already exclude non-present objects. Let us therefore say that an object exists *temporally* if and only if it either has existed, does exist now, or will exist. With 'exists' read in this broader sense, the presentist thesis becomes:

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[45] Versions of this objection can be found in [Lombard 1999], [Lombard 2010], [Callender 1998], [Meyer 2005], and [Savitt 2006]. See also [Dorato 2006].

(P2) Nothing *exists temporally* that is not present.

This thesis is non-trivial, but it is also clearly false. Here is a counterexample:

(JC) Julius Caesar crossed the Rubicon.

Because non-existent people cannot cross rivers, this claim can only be true if Caesar existed. But if Caesar did exist then he does exist temporally. And since he does not exist now, this means that there is an object, namely Caesar, that exists temporally without being present. Given that (JC) is true, the thesis (P2) is false.

If (P1) and (P2) are the only ways of disambiguating P—as I claim they are—then presentism is either trivially true or obviously false. This means that there are two ways of being an eternalist. One option is to define eternalism as the negation of (P). In this case, eternalism would be either trivially false or obviously true, depending on which of the two readings of (P) we adopt. A more interesting way of being an eternalist is to recognize the triviality of (P), and to argue that all times are metaphysically on a par. I am an eternalist in this latter sense, for I believe there to be *no* principled difference between the present and past and future times.
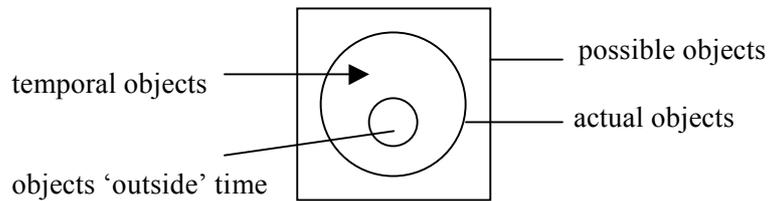
3. Existence Simpliciter

Some authors argue that the choice between (P1) and (P2) presents a false dilemma because both readings appeal to tensed notions of existence. It is a feature of English syntax that we cannot attribute existence to an object without committing ourselves, by our choice of tense for the verb *to exist*, to a past, present, or future time at which the object exists. To circumvent this problem, some presentists want to separate the tense from the verb, and then employ the

resulting tenseless notion of *existence simpliciter* to spell out the presentist thesis:[46]

(P3) Nothing *exists simpliciter* that is not present.

There is some debate about whether such a de-tensing is possible, but that is not something we need to worry about here. Take *any* candidate for the notion of existence simpliciter, and suppose that some object *a* exists in this sense (whatever it may be). Then *a* is either an actual object or a merely possible object (if there are such objects). And if *a* is actual then it either exists at some time, or it exists at no time ("outside" time, if that is possible). But if *a* exists *at* some time then it either has existed, does exist now, or will exist, and thus does exist temporally.

Quite independently of our account of existence simpliciter, this means that the following conditional is necessary because its consequent exhausts all the ways in which *a* could exist:

a exists simpliciter $\rightarrow$ (*a* is merely possible $\vee$ *a* is "outside" time $\vee$ *a* is temporal)

Existence simpliciter could only go beyond temporal existence if it included some objects outside time, or some objects from other

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[46] See, e.g., [Hestevold and Carter 2002], [Ludlow 2004], [Szabó 2006], [Sider 2006], and [Wüthrich forthcoming].

possible worlds. And while both of the following might be non-trivial, neither is a presentist thesis:

(P4) Nothing *is merely possible* that is not present.
(P5) Nothing *is "outside" time* that is not present.

Thesis (P4) is a roundabout way of denying the existence of merely possible objects and (P5) is a way of rejecting objects outside time Neither specifies a way in which the present differs from other times. For assessing presentism, temporal existence is therefore already the most general notion of existence that needs to be considered. No matter how we spell out the details of the proposal, an appeal to existence simpliciter does not expand the range of options.

Hence the only available disambiguations of the presentist thesis are the trivially true (P1) and the obviously false (P2), plus intermediate positions that provide different combinations of the unappealing features of (P1) and (P2). (This could happen if our notion of existence simpliciter is more restrictive than temporal existence, but also more permissive than present existence.)

4. Quantified Tense Logic

Many readers will be familiar with the difficulties that emerge when trying to combine modal operators and quantifiers in a quantified modal logic. Since similar complications arise for the interaction between tense operators and quantifiers, one might argue that the status of presentism can only be settled by our best quantified tense logic. Indeed, it is sometimes suggested that the debate between presentists and their opponents is really about whether we should adopt a tensed or a tenseless account of quantification. I do not think this is correct, but attending to these issues does help to clarify what is at stake in the debate.

Consider a tense logic with two primitive tense operators P ("it was the case that") and F ("it will be the case that"). The dual op-

erators H ("it was always the case that") and G ("it will always be the case that") are defined as abbreviations for ¬P¬ and ¬F¬, respectively. Similar to the modal case, where sentences without modal operators are used to make claims about what is actually the case, we use sentences without tense operators to make claims about what is presently the case. A system of tense logic is then said to be *normal* if and only if (i) it validates all instances of the axiom schemata H($\varphi \rightarrow \psi$) $\rightarrow$ (H$\varphi \rightarrow$ Hψ) and G($\varphi \rightarrow \psi$) $\rightarrow$ (Gφ $\rightarrow$ Gψ), and (ii) is closed under the inference rule of temporal generalization:

If I φ then I Hφ and I Gφ

(Here 'I' stands for derivability in our system of tense logic.) In any normal system, the tense operators are guaranteed to be *monotone*:

If I $\varphi \rightarrow \psi$ then I P$\varphi \rightarrow$ Pψ and I F$\varphi \rightarrow$ Fψ

The minimal normal tense logic, which contains nothing beyond what is required for (i) and (ii), is often supplemented with additional axioms. For example, there are axioms that guarantee that the time series is dense, complete, or that it lacks branches ([Burgess 2002]). Since the status of presentism does not depend on which of these additional principles we accept, we can ignore these complications here.

When adding quantifiers to such a tense logic, there are two approaches to choose from. On a *tensed quantifier* view, the quantifiers have different domains at different times. At any given time, the quantifiers range over only those objects that exist then. On an *untensed quantifier* view, the quantifiers always range over the same domain of objects, which includes all objects that did, do, or will exist.

The main difference between these two approaches to quantification concerns the way they deal with existence. Tensed

quantifiers allow us to *define* a time-relative existence predicate E! in terms of quantification and identity:

$$\text{(E)} \quad E!x \leftrightarrow \exists y\, x = y$$

This does not work with untensed quantifiers. In that case, every object in the unrestricted domain satisfies the condition on the right-hand side of (E), not only those that exist at the time under consideration. This means that systems with untensed quantifiers not only separate quantification and *tense*, they also separate quantification and *existence*. To express time-relative existence claims, they need a primitive existence predicate that is logically independent of quantification.

If we adopt untensed quantifiers then we can obtain a complete axiomatic system for our logic by combining standard axioms for tense operators with standard axioms for quantifiers and identity, plus two tensed Barcan formulae to account for the interaction between quantifiers and tense operators ([Meyer 2011], sec. 4):

$$\text{(TBF)} \quad P\,\exists x\, \varphi \leftrightarrow \exists x\, P\varphi \qquad F\,\exists x\, \varphi \leftrightarrow \exists x\, F\varphi$$

Such a quantified tense logic allows us to distinguish two types of predicates. Some predicates—such as 'has mass one kilogram' or 'crosses the Rubicon'—are *existence-entailing* in that they can only be truly attributed to objects at times when they exist, and thus fall within the extension of the (primitive) existence predicate. Existence-entailing predicates work like the predicates in standard first-order logic, but a quantified tense logic with untensed quantifiers can also admit predicates that are not existence entailing. For example, Vincent van Gogh is famous *now*, but he was not famous while he existed, which means that the predicate 'is famous' is not existence-entailing.[47]

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[47] A more detailed discussion of existence-entailing predicates can be found in [Prior 1967], p. 161, [Woods(1976)], and [Cocchiarella 1968], [Cocchiarella 1969]. As introduced by [Plantinga 1983], *serious actualism* is the view that objects do not have properties in worlds in which they

The logic of tensed quantifiers is far more complicated. Since quantifiers and tense operators are only guaranteed to commute if the domain of quantification does not change over time, we would have to give up the tensed Barcan formulae. Also in this case, the question arises whether predicates may be attributed to objects at times at which they do not exist. If we prohibited all such attributions then our tense logic would remain fairly simple, but it would lack the resources to express many otherwise unproblematic claims about presently non-existing objects. Yet if we do admit attributions to non-existent objects then we can only retain tensed quantifiers if we also restrict existential generalization. It is now true that van Gogh is famous, but from that alone it does not follow that someone exists now who is famous. If we adopt tensed quantifiers then we need to modify the *quantificational* part of our logic, and that turns out to be a rather messy undertaking. In particular, we can no longer obtain a complete system of quantified tense logic by combining *standard* axioms for tense operators with *standard* axioms for quantifiers.

However, it is doubtful whether this extra work would be worth the effort. Systems of quantified tense logic with untensed quantifiers are bound to remain unsatisfactory in other respects. For example, Hans [Kamp 1971] argues that a tense logic with tensed quantifiers cannot express all temporal claims unless it also contains a two-dimensional "now" operator N. This two-dimensional tense operator is governed by the stipulation that $N\varphi$ is true at a time if and only if φ is true at the present time. Frank [Vlach 1973] defends a similar claim about the two-dimensional "then" operator. As I show in [Meyer 2009], though, we do not need either operator if we use untensed quantifiers. This suggests that a quantified tense logic with untensed quantifiers has superior expressive resources.

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do not exist. Similarly, some authors defend a *serious presentism*, according to which objects do not have properties at times at which they do not exist. See, e.g., [Bergmann 1999] and [Davidson 2003]. I shall not discuss this view here because I agree with [Hinchliff 2010] that serious presentism is independent of presentism, as it is usually construed, and that it is not particularly plausible in its own right.

5. Untensed Quantifiers

It is not obvious which of these two approaches to quantification presentists ought to prefer. Tensed quantifiers might be in line with their stated aim of "taking tense seriously," but untensed quantifiers are a more plausible candidate for the notion of existence simpliciter. In the end, though, none of this matters, for it turns out that *neither* account of quantification helps presentists evade the triviality objection.

Suppose we adopt untensed quantifiers. Then the existence predicate E! expresses a tensed notion of existence and the existence quantifier $\exists$ an untensed notion of existence simpliciter. The three readings of the presentist thesis could therefore be formalized as follows:

(P1) $\neg \exists x (\text{E!}x \wedge \neg \text{E!}x)$
(P2) $\neg \exists x ((\text{PE!}x \vee \text{E!}x \vee \text{FE!}x) \wedge \neg \text{E!}x)$
(P3) $\neg \exists x \neg \text{E!}x$

This adds a layer of formal sophistication to our discussion without doing anything to improve the lot of presentism. Thesis (P1) is still a logical truth and (P2) obviously false. The status of (P3) depends on whether our tense logic validates $\forall x (\text{PE!}x \vee \text{E!}x \vee \text{FE!}x)$. If it does, then (P3) reduces to (P2). If it does not, then (P3) is either not a presentist thesis (by denying the existence of some non-temporal objects), or it combines aspects of the trivially true (P1) and the obviously false (P2).

But this regimentation does allow us to take a closer look at the inferential steps one needs to take to get from the truth of (JC) to the falsity of (P2). Let us abbreviate "crosses the Rubicon" as '*R*' and let '*c*' be a name for Julius Caesar. Then the argument against (P2) proceeds as follows:

1	PRc	Caesar crossed the Rubicon
2	$\neg E!c$	Caesar is dead
3	$Rc \rightarrow E!c$	R is existence-entailing
4	$PRc \rightarrow PE!c$	3, monotonicity of P
5	$PE!c$	1, 4, modus ponens
6	$PE!c \vee E!c \vee FE!c$	5, truth-functional logic
7	$(PE!c \vee E!c \vee FE!c) \wedge \neg E!c$	2, 6, truth-functional logic
8	$\exists x((PE!x \vee E!x \vee FE!x) \wedge \neg E!x)$	7, existential generalization

Presentists might object to the existential generalization from line 7 to line 8. Since the singular term 'c' lacks a present referent, they might argue, it is not *now* permissible to existentially generalize on positions that this term occupies. I am not sure that this concern needs to be taken very seriously, but accepting it would in any case be tantamount to rejecting our quantified tense logic with untensed quantifiers, which does license such inferences. The net effect of restricting existential generalization to individual constants with presently existing referents is to turn tenseless quantifiers into tensed ones, and to reduce (P2) to the trivial thesis (P1).

Another way of trivializing (P2) is to adopt a tense analogue of Timothy Williamson's ([Williamson 1998], [Williamson 2002]) account of quantified modal logic. Williamson accepts Bernard Linsky and Edward Zalta's simplest quantified modal logic, on which quantifiers range over the objects in all possible worlds [Linsky and Zalta 1994]. But he *also* accepts the definition (E) of the existence predicate in terms of quantification and identity. Wil-

liamson concludes that every object exists in every possible world, but lacks spatial and temporal properties in some of them. Applied to our tense logic, this would mean claiming that every object exists at every time, but sometimes falls outside the extension of *all* the predicates that we earlier classified as "existenceentailing. " On this view, van Gogh still exists now; he just lacks mass, spatial location, and so on. Since premise 2 of our argument is false on such an account, we would no longer have a problem with (JC). But this benefit comes at the cost of trivializing (P2), which would turn out to be a theorem of our quantified tense logic. If everything always exists then there is nothing that exists at some time without being present.

This also points to an odd feature of all of our readings of (P2). Suppose it turned out—either by virtue of our quantified tense logic, or by pure chance—that all objects are sempiternal and thus exist at all times. Then (P2) would be true because all sempiternal objects exist now. But there would still be no significant *ontological* difference between the present and other times because exactly the same objects would exist at all times. So even if (P2) were true, it is not clear that presentism would be much better off as a consequence.

6. Tensed Quantifiers

In his response to the triviality objection, Thomas [Crisp 2004] argues that the case against (P2) confuses a *de dicto* truth with a *de re* falsehood.[48] He thinks that presentists should admit that Caesar crossed the Rubicon, P*Rc*, and also that this entails that someone crossed the Rubicon, P$\exists xRx$. By doing so, they would accept a *de dicto* claim that predicates past truth of a *proposition*. But Crisp argues that this does not trivialize presentism because one can still reject the *de re* claim $\exists x$P*Rx*, which states that the open sentence 'P*Rx*' is satisfied by some *object*. However, if we adopt a quantified modal logic with untensed quantifiers then this is not a

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[48] See also [Sider 2006], p. 78.

coherent position. According to the Tensed Barcan formulae (TBF), Crisp's *de re* claim is logically equivalent to his *de dicto* claim, which means that one cannot accept one without the other.

At this point, presentists might be ready to explore the second approach to quantified modal logic. If we use tensed quantifiers then the *de dicto* claim $P \exists x R x$ does not entail the *de re* claim $\exists x P R x$. This might look promising, but there is nothing controversial about this. Unless we adopt the "Williamsonian" view that all objects are sempiternal, it does not follow from there having been Rs that something exists *now* that *was R*. Nor does this help the presentist avoid the main dilemma. In terms of tensed quantifiers and identity, we could define an existence predicate via (E) and then offer $\neg \exists x \neg E! x$ as a formalization of (P1), which is again a theorem of our quantified tense logic and thus trivially true.

The regimentation of (P2) is a little bit trickier in this case, but that is largely due to the expressive limitations of quantified tense logics with tensed quantifiers. As mentioned earlier, such a logic would only provide a plausible framework for regimenting temporal discourse if it also contained Kamp's "now" operator N in addition to P and F. In that case, we could formalize (P2) as:

$$\neg P \exists x (E! x \wedge N \neg E! x) \wedge \neg F \exists x (E! x \wedge N \neg E! x)$$

However, on any acceptable way of spelling out the details of such a tense logic, the first conjunct contradicts $P(E! c \wedge N \neg E! c)$, which follows from $P R c$ and $\neg E! c$. So (P2) is still incompatible with (JC), and nothing has been gained. There might well be some systems with untensed quantifiers that do not permit any of these inferences, but presentism does not miraculously become a coherent thesis by adopting a background logic that is too weak to reveal its problems. If we put such impoverished systems of tense logic aside, then the dilemma for the presentist arises quite independently of whether we adopt tensed or tenseless quantifiers.

All the proposals considered so far attempt to resolve the difficulties with (JC) by modifying the quantificational part of our logic. In principle, one could also try to change the underlying tense logic. For example, one could resist the inference from P*Rc* to PE!*c* by denying that tense operators are monotone (line 4). Then it would not follow from Caesar's having crossed the Rubicon (line 1) that he did exist (line 5), even if we grant that *R* is existence-entailing (line 3). The set of sentences {P*Rc*, ¬PE!*c*, H(*Rc* → E!*c*)} would turn out to be consistent, but such "logical per-versions" would only be permitted within the scope of tense operators, and not when reasoning about the present moment. This defuses the problem with (JC) and also succeeds in making a principled distinction between the present and other times. Only truths about the present time would be closed under entailment. This is an intriguing position, but it is predicated on the assumption that tense operators are *not* mono-tone, and I do not see any reasons for accepting this. If Caesar crossed the Rubicon then it does follow that he did exist. As long as we can assume this much, (JC) is a counterexample to (P2).

7. Presentism and Actualism

Many philosophers—including some who reject presentism—worry that the triviality objection would prove too much. Since presentism is the temporal analogue of the modal thesis of *actualism*, they reason, accepting the triviality objection would force us to adopt a similarly dismissive view about actualism, and that cannot be right. Since actualism is widely accepted to be a non-trivial thesis, something must have gone wrong with our argument against presentism.[49]

My reply is that the mistake lies with the assumption that actualism has a temporal analogue, not with the triviality objection to

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[49] This argument is suggested by [Sider 1999], (sec. 1), [Zimmerman 1998], p. 211, [Hestevold and Carter 2002], and [Crisp 2007].

presentism. To see where the two cases come apart, consider the modal counterpart of the presentist thesis (P):

(A) Nothing *exists* that is not actual.

This thesis is again ambiguous between two different readings of the 'exists' that occurs in it. If we interpret it as expressing actual existence (existence in the actual world) then we get a trivially true thesis:

(A1) Nothing *actually exists* that is not actual.

If we interpret the 'exists' as expressing possible existence (existence in some other possible world) then we get a non-trivial thesis that is obviously false:

(A2) Nothing *possibly exists* that is not actual.

This claim is incompatible with the truism that there could have been objects that do not actually exist. Hence (A) is either trivially true or obviously false. How do actualists escape from this dilemma? The short answer is that they *don't*. The nontrivial thesis commonly called 'actualism' in the philosophical literature is neither (A) nor any other claim of quantified modal logic. Actualism is a version of the possible-worlds analysis of the modal operators, and thus a claim in the *meta*-theory of modal logic. It is a thesis about the modal operators, not about the scope of quantifiers.

Instead of taking it as a conceptually primitive, the possible-worlds analysis proposes to eliminate the possibility operator $\Diamond$ in favor of quantification over possible worlds, which are the different *ways the world might have been*:

$\Diamond\varphi$ iff φ is true in some possible world.

What this proposal amounts to depends on our view about the nature of possible worlds. Modal realists like David Lewis argue that the actual world is a concrete object that consists of us and our

surroundings. Other possible worlds are just like that; they are merely spatiotemporally disconnected from our world, like raisins in a pudding. Actualists (in the standard sense) claim that possible worlds are actually existing, abstract objects. Actualists disagree amongst themselves about which particular abstracta are to be identified with possible worlds, but all of them distinguish the *actual world*, which is an abstract object, from *actuality*, which is the mereological sum-total of all objects that actually exist. Apart from all concrete objects, actuality contains all abstract possible worlds. Which of these worlds is actual depends on which of them correctly describes the contingent features of actuality, including the arrangement and properties of the concrete objects.

Actualists and modal realists *agree* on the status of thesis (A). Both regard (A1) as trivially true and (A2) as obviously false, and they also agree that there is no intrinsic difference between the actual world and the merely possible ones. Modal realists think that other possible worlds are just like ours; they are aggregates of concrete objects. Similarly, all of the abstract possible worlds postulated by the actualist are metaphysically on a par. Which of them counts as actual depends on which of them happens to give the correct description of of the contingent parts of actuality. Being actual is an *extrinsic* feature of a possible world, but there is no principled intrinsic difference between the actual world and merely possible ones.

Nevertheless, there are substantial issues at stake in the choice between actualism and modal realism, and one might suggest that presentists adopt a similar strategy. The idea would be to abandon the trivial thesis (P) and instead try to formulate presentism as an account of the truth-conditions of past and future tense claims in terms of presently existing, abstract objects. But this strategy quickly runs into difficulties. Say that a *possible present* is an abstract *way the present might have been*, and consider a past tense claim of the form P_φ. Then it is clearly incorrect to say, in analogy with the modal case, that P_φ is true just in case φ is true according to some possible present. The reason is simple: the vast majority of possible presents never happen, and even those that do happen are

not all past times. We could instead say that P_φ is true if and only if φ is true according to some possible present *that is also a past time*, but that just brings up the question of what makes it the case that a possible present *is* a past time. The obvious answer is that a possible present is a past time if and only if everything that is true according to this possible present *was* true, but this appeals to the very kind of past tense claim that we are trying to eliminate in favor of quantification over possible presents.

This points to a key difference between times and possible worlds that I explore in more detail in [Meyer 2006]. The possible-worlds analysis succeeds because there are no *contingent* facts about possibility. According to the standard modal system S5, any claim that is possible is necessarily possible, $\Diamond\varphi \to \Box\Diamond\varphi$, and any claim that is impossible is necessarily impossible, $\neg\Diamond\varphi \to \Box\neg\Diamond\varphi$. That is why it is *necessarily* true that $\Diamond\varphi$ holds just in case φ is true in some possible world. What possible worlds there are does not depend on what possible world is actual. By contrast, it *is* a contingent matter what was, is, and will be true. The same possible present can qualify as a time in one possible world and not in another. Which abstract possible presents are times depends on contingent facts about how things *were*, *are*, or *will be*. We cannot eliminate the tense operators P and F in favor of quantification over times because we need to appeal to claims involving these operators to specify which possible presents are times in the first place. Since there is no tense analogue of the possible-worlds analysis of the modal operators, there is also no temporal counterpart of the non-trivial modal thesis of actualism.

8. Reconstructive Presentism

A key ingredient of my case against (P2) is the assumption that (JC)—or some other claim like it—is in fact true. *Radical* presentism avoids this problem by rejecting all claims about past and future objects as either false or meaningless. This view succeeds in making a principled and non-trivial ontological distinction between the present and past and future times, but it is also clearly unten-

able. Nothing more needs to be said about it than to repeat that it does deny, on purely philosophical grounds, that Caesar crossed the Rubicon.

However, many presentists believe that they do not need to be quite *that* radical. Instead of rejecting past and future tense claims outright, they offer claims about presently existing objects as substitutes. Such a *reconstructive* presentism can take a number of different forms. For example, *trace presentism* offers descriptions of presently existing causal traces (memories, fossils, historical documents, etc.) as stand-ins for claims like (JC).[50] Trace presentism has the odd consequence that past tense claims that are true now cease to be true at a future time at which all relevant traces have disappeared. But some presentists are happy to accept this, and Jan [Łukasiewicz 1970], p. 128, even thought that this would be a good thing:

> There are hard moments of suffering and still harder ones of guilt in everyone's life. We should be glad to be able to erase them not only from our memory but also from existence. We may believe that when all the effects of those fateful moments are exhausted, even should that happen only *after* our death, then their causes too will be effaced from the world of actuality and pass into the realm of possibility. Time calms our cares and brings us forgiveness.

Another version of reconstructive presentism can be traced back to [Lucretius 1947] (bk. I, 459–80), who wants to trade ontological commitment to past objects for exotic properties of present objects. To assert (JC), he claims, is to say that the river Rubicon, which is a presently existing object, possesses the property of having-been-crossedby-Caesar. John [Bigelow 1996] defends a variant of this view, which attributes prop-erties to the mereological sum-total of everything that presently exists. On Bigelow's view, (JC) asserts that this present aggregate of everything possesses the property of

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[50] See, e.g., the paper by Brian Kierland in this volume.

being-such-that-Caesar-crossed-the-Rubicon. The task of deciding which of these proposals to adopt is sometimes called the "truth-maker" or "grounding" problem for presentism. My own view is that *all* versions reconstructive presentism are untenable because they all run into the following problem.

If the proposed substitutes are meant as *paraphrases* of past tense sentences like (JC) then we are being offered little more than a range of implausible linguistic theses. That Caesar crossed the Rubicon and that there are presently such-and-such causal traces of the event are clearly two *different* claims. And when I say that Caesar crossed the Rubicon, I do not mean to attribute some weird property to the Rubicon, or to the sum-total of all presently existing objects. My claim is about *Caesar*. To determine what precisely is meant by (JC) might be a difficult task, but there is no need to settle this general question. As long as it is granted that (JC) entails that Caesar did exist— and it does—then (P2) is in trouble. The proposed substitutes for (JC) either have the same consequence, in which case nothing is gained, or they do not, in which case they are not synonymous with (JC) and do not qualify as paraphrases.

Perhaps this objection misreads the proposals, and the claims about presently existing objects are meant as genuine *substitutes* to be put in place of (JC), rather than as proposed paraphrases. But in that case we would still be asked to *reject* claims like (JC) for purely philosophical reasons, and reconstructive presentism would just collapse into radical presentism.

In this respect, presentists are in a similar position as mathematical nominalists, who deny the existence of mathematical objects such as numbers, functions, or sets. Just as presentists run into difficulties with (JC), mathematical nominalists have trouble accounting for simple arithmetic truths like "There are prime numbers between ten and twenty. " This claim are clearly true, but it entails the existence of the very objects that mathematical nominalists want to reject. Reconstructive nominalists try to get around this problem by offering claims about concrete objects as substitutes. For example, a classic paper by Nelson Goodman and W. V. Quine

tries to construe arithmetic truths as claims about the spatial parts of material objects ([Goodman and Quine 1947]). As John P. Burgess argues ([Burgess 1983]), reconstructive nominalism runs into similar difficulties as reconstructive presentism. Reconstructive nominalism is either advancing an implausible linguistic thesis about mathematical claims, or else it rejects uncontroversial mathematical truths for purely philosophical reasons.

In both cases, the driving force is a philosophical "intuition" that there are no non-present objects, or no mathematical ones. I do not think either intuition needs to be taken very seriously, but in one respect the presentists are even worse off than the mathematical nominalists. Mathematical nominalists do at least have a genuine epistemological worry to motivate their view. If mathematics were indeed about a realm of causally inert mathematical objects then it would be unclear how beings like us, who acquire knowledge through our senses, could ever find out truths about them. No such worries arise for claims about past objects, which are epistemologically continuous with the rest of our empirical knowledge. We acquire knowledge of Caesar's existence through exactly the same sort of causal mechanism by means of which we acquire knowledge of presently existing ones.

9. Conclusion

In sum, I think that the triviality objection to presentism can stand as it is. There is no reading of the presentist thesis on which it makes a non-trivial claim that is not also obviously false. To arrive at this conclusion required a mix of logical analysis and empirical investigation. But all we needed by way of the latter was reassurance there there once were (or will be) objects that do not presently exist. There is no need to engage in a sophisticated investigation of the theory of relativity. Even if Einstein had been wrong and Newton right about the laws of mechanics, presentism would still have been either trivially true (P1) or obviously false (P2).

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Part 2

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Presentism: Problems and Defenses

The Fate of Presentism in Modern Physics

Christian Wüthrich

1. Introduction: ersatzist presentism

Defining 'presentism' in a way that saves it from being trivially false yet metaphysically substantively distinct from eternalism is no mean feat, as the first part of this collection testifies. In [Wüthrich forthcoming], I have offered an attempt to achieve just this, arguing that this is best done in the context of modern space-time theories. Here, I shall refrain from going through all the motions again and simply state the characterization of an ersatzist version of presentism as it has emerged from considerations there. Any acceptable formulation of presentism should remain neutral among competing spacetime theories in order to enable the present project of assessing the compatibility of presentism with various theories of modern physics, including both spacetime theories and theories of physical processes situated in a spatiotemporal setting.

The main issue in the triviality debate as I see it concerns the representation of events without an accompanying ontological commitment. If the presentist can find a way to represent non-present events without *eo ipso* committing herself to their existence, then expressing her metaphysical disagreement with the eternalist seems rather straightforward. This naturally leads to an ersatzist position which introduces non-present events merely for representational purposes without imbuing them with physical existence.

The vantage point of modern spacetime theories is the presupposition of a four-dimensional manifold M with certain topological and differential structure. Furthermore, the manifold M is equipped with a metric field *gab* which encodes all the information concerning the spatiotemporal relations among all the points of M. Eternalism and presentism are then taken to disagree as to over which points of M they quantify when quantifying over all spatiotemporal events where physically existing entities can be located. In this context, *eternalism* is understood as the position claiming physical existence for all events in M. In contrast, *presentism* partitions M into past, present, and future events. This partition results, e.g., from assuming an equivalence relation *S* ('simultaneity') to be defined on M such that the equivalence classes contain cotemporal events. Time, on this view, is the one-dimensional linearly ordered quotient set of these equivalence classes. One such equivalence class is privileged in that it contains the 'present' events, the set of equivalence classes to its past according to this ordering contains the 'past' events and the set of equivalence classes to its future the 'future' events. Obviously, the sets of all past and future events thus have further structure indicating just how much to the past or future a particular event is located. Thus, the sum total of physical existence according to the presentist is a proper subset of that according to the eternalist.

An obvious worry arising from this manner of characterizing the position is that presentism does not just amount to the assertion that only present events or entities exist, but also that the present undergoes a dynamical 'updating', or exhibits a quality as of a fleeting whoosh, and that this additional dynamical aspect is what threatens the substance of the debate between the presentist and her eternalist opponent. In order to capture this dynamical quality, the thought goes, the presentist must quantify not just over the events contained in one equivalence class corresponding to the present present, but also over all events in all the other equivalence classes containing the past and future presents. Once this point is granted, it seems as though presentism deflates into admitting all the events of M as existing. But this clearly misses the presentist's point: the presentist's sum total of existence remains a proper subset of the

eternalist's, fleeting whoosh or not. I am not pretending as if to characterize in satisfactory detail what exactly constitutes this dynamical quality is without difficulty. But for present purposes, presentism should be understood as a merely *ontological* hypothesis making an assertion as to what exists, and not an *ideological* statement about the qualities— dynamical or otherwise—of that which exists. Perhaps this is a mistake. But if it is, at least not without precedent.

The remainder of this essay shall assume, however fallibly, that presentism is a metaphysically substantive thesis markedly different from eternalism. It contends that physical existence is restricted to a spatially extended manifold of events simultaneous with the *here-now*. This view comes under severe pressure from modern physics, most notably from special relativity (SR), as shall be explicated in Section 2. The source of the tension is found in the fact that in SR, and hence in modern physics, space and time are intertwined in a way such that whether two given spacetime events exemplify the relation of simultaneity is no longer an absolute and global matter. But if simultaneity cannot serve as on absolute and global basis for determining whether or not a spatially distant event is present (in the temporal sense), then we seem to lack an objective basis on which matters of physical existence could turn for a presentist metaphysic.

Naturally, presentists have responded to the challenge. The problem, of course, should not be misconstrued as dealing with an in principle insurmountable inconsistency between presentism and physics; rather, the challenge amounts to grounding the necessary distinctions (past, present, and future) in a way that is responsive to modern physics while remaining faithful to presentist intuitions. The presentist responses to this challenge, both actually stated and hitherto unarticulated, shall be chronicled in the remainder of this essay, together with an assessment of the prospects of success and the price tag for each response. In an attempt to bring order into the variegated multitude of presentist strategies to counter the challenge from modern physics, a systematization is offered in Section 3. The basic distinction of presentist responses is into compatibilist

and incompatibilist strategies, with the former arguing that presentism is compatible with the truth of SR despite initial appearances and the latter accepting their incompatibility while rejecting that this entails the denial of presentism. It turns out to be useful to introduce a distinction orthogonal to the one between compatibilism and incompatibilism: presentism can not only be compatible or incompatible with respect to SR, but to fundamental physics—contemporary or prospective. This distinction derives its utility from the fact that there are a number of presentist retorts readily admitting that their view is inconsistent with SR but insisting on its compatibility with fundamental physics.

These two distinctions span a matrix of four types of strategies. The two boxes of strategies accepting an incompatibility with contemporary, and possibly future, fundamental physics will be examined in Section 3. Responses purporting a compatibility with either contemporary or at least future fundamental physics will be dealt with in Sections 4, if they also allege a compatibility with SR, and 5, if they accept that pre-sentism is inconsistent with SR. Section 6 will take stock and dare a rather negative comprehensive appraisal of the prospects of presentism to survive the pressure from modern physics in any form that permits retaining its appeal.

2. The challenge issued by special relativity

If by *presentism* we thus mean the thesis according to which there exists an absolute spatially extended present and all there is is spatiotemporally located in this present, then a strong argument can be offered to the effect that such a position is precluded if SR is at least approximately true. The goal of this section is to carefully develop this argument.

Starting out from two major premises,[51] SR asserts a certain structure of space and time. In 1908, Hermann Minkowski showed

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[51] And some minor ones, such as the homogeneity and isotropy of space and time. The two major axioms of SR are the *Light Postulate*, according

that this inferred structure is best captured by postulating a four-dimensional manifold of 'events', i.e. of dimensionless points, which is differentiable and endowed with the additional structure of a time orientation and a metric field encoding the absolute spatiotemporal—but not the spa-tial or temporal—separation between events. In fact—and this cuts to the core of the difficulty for the presentist—, there simply *is* no absolute spatial or temporal meas-ure of separation in SR. In Minkowski's famous words: "Hence-forth space by itself, and time by itself, are doomed to fade away into mere shadows, and only a kind of union of the two will pre-serve an independent reality. " [Minkowski 1952] (p. 75; in turn a translation of [Minkowski 1908]] What is absolute, i.e. independ-ent of a frame of reference, is only the *union* of space and time; in contrast, the totality of space at a particular time is only even defined relative to a frame of reference. This means that there sim-ply is no absolute and objective truth concerning which spatially distant events are simultaneous with the event representing the here and now.

Let us state this with slightly more rigour. From the two prem-ises mentioned, it follows that the uniquely correct way to trans-form the time and space coordinates of events—and hence the as-signment of temporal and spatial location—of two different inertial frames in relative motion is by employing so-called 'Lorentz trans-formations'.

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to which "light propagates through empty space with a definite velocity which is independent of the state of motion of the emitting body" [Ein-stein 1905] (p. 891), and the *Relativity Principle*, according to which "the same laws of electrodynamics and optics will be valid for all frames of reference for which the equations of mechanics hold good [i.e., for inertial frames]" (ibid.).
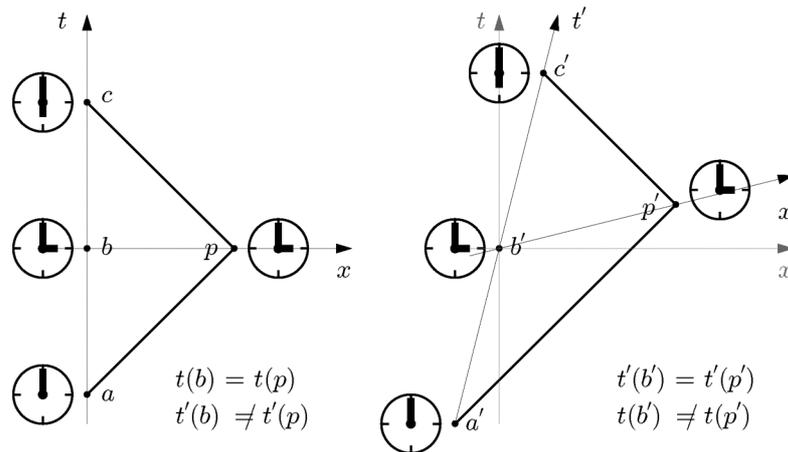
Figure 1: Einstein-Poincaré convention for synchronizing distant clocks in two reference frames related by a Lorentz transformation

Somewhat imprecisely, Lorentz transformations are a kind of hyperbolic rotation in a mathematical space including a time direction.[52] Apart from all the other fun consequences of Lorentz-transforming physical systems such as time dilation, length contraction, and the infamous twin paradox, Lorentz transformations also have profound consequences for the temporal (and spatial) ordering of events. To see how Lorentz transformations affect this ordering, consider the so-called *Einstein-Poincaré convention* for synchronizing spatially distant clocks by means of light rays, illustrated in Figure 1.

According to this convention, a spatially distant point p is simultaneous with an event b in the rest frame of a clock just in case a light ray is reflected back to the clock at p such that the same duration lies between the events a of the emission of the light ray and b as does between the event c of the reception of the light ray and b. In other words,

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[52] For an intuitive derivation and illustration, [Janssen forthcoming] is highly recommended. [Giulini 2010] is a good source for the more technical aspects of Minkowski spacetime.

$$t(b) = t(p) \Leftrightarrow t(b) - t(a) = t(c) - t(b),$$

where $t(e)$ gives the time coordinate of any event $e \in M$ in the unprimed reference frame. If we Lorentz transform into another reference frame—with transformed coordinates or manifold points denoted by primes—and apply the same convention to determine the set of spatially distant events that are simultaneous with $b \equiv b'$, it becomes evident that the set of spatially distant simultaneous events is different in different reference frames. For starters, the point p on the unprimed x-axis is not simultaneous with $b \equiv b'$ according to the primed frame:

$$t'(b) \neq t'(p).$$

Instead, the primed frame evaluates the event $b \equiv b'$ as simultaneous with an event p, which is later than p (in both frames) and hence not simultaneous with b according to the unprimed frame:

$$t'(b') = t'(p'),$$
$$t(b') \neq t(p').$$

In short, for an inertial observer at rest with respect to the *unprimed* frame, all the spacetime events on the x-axis are simultaneous with b, whereas for an inertial observer at rest with respect to the *primed* frame, those spacetime events on the x'-axis are simultaneous with $b' \equiv b$. Hence, the simultaneity of distant events is no longer absolute but only relative to inertial frames once one accepts the Lorentz symmetry demanded by SR.[53]

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[53] One might be tempted to think that the problem only arises because simultaneity is *conventional*, as was implied above when I started out from the Einstein-Poincaré *convention* of simultaneity. But this would be missing the point: while different conventions are surely possible, the Einstein-Poincaré convention is uniquely suited for presentist purposes as it maintains the symmetry of simultaneity (within a fixed frame) by choosing the midpoint between a and c, while other conventions would

The presentist asks us to be realist about all events and objects in the *present*, but no others. Lest the position collapses to a solipsistic denial of the reality of anything at a spatial distance, she thus needs to procure an account of what we are to include among the things present—and to exclude as not being part of the present. In other words, presentism must involve an at least implicit commitment to a way to determine the simultaneity, and hence co-presence, of spatially distant events with the vantage point of the here and now. Prior to the advent of relativistic physics, such a commitment was both unambiguous and unproblematic insofar as pre-relativistic physics readily offered a robust notion of absolute simultaneity. But relativity appears to pull the rug from underneath any metaphysical view which relies on an objective, i.e. absolute, determination of what is past, present, and future.

An argument against metaphysical views of time that postulate or entail that the future is genuinely open in the sense that it is not (yet) real, or does not (yet) exist, as of the present moment has been advanced by Wim Rietdijk ([Rietdijk 1966]) and Hilary Putnam ([Putnam 1967]).[54] This argument starts out from the assumption that the task at hand is to determine the set of spatially distant spacetime events which are simultaneous, and hence *co-present*, with the *here-now*, the vantage point from which the present is thus to be constructed. As a next step, invoke the equivalence relation S which we found in §1 the presentist to rely on. Physically, this binary relation is interpreted to signify the simultaneity between two spacetime events. Mathematically, it enables the partitioning

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not help against the *relativity* of simultaneity and make things worse by frivolously giving up the symmetry of the relation. In fact, nonstandard conventions of simultaneity could threaten presentism already in pre-relativistic physics. But this threat could easily be averted by choosing a sensible (standard) convention of what it is to be simultaneous.

[54] The sense in which the future is supposed to be genuinely open is important to note, as eternalism is arguably consistent with at least some forms of indeterminism. For a reading of Rietdijk's and Putnam's argument as an argument to the conclusion that SR is deterministic, see [Rakić 1997], §4. 3.

of the spacetime events into equivalence classes of events, ordered by a time parameter. Metaphysically, it creates the sets of co-existing events. On a presentist metaphysics, to repeat, one of these equivalence classes is privileged in that its elements alone exist concretely. In these terms, the task can be characterized as that of being handed an event representing the *here-now* and a binary relation S which we are to use to determine which other events exist.

As a consequence of the relativity of simultaneity found in SR, if event b denotes the *here-now* as in Figure 1, there is no frame-independent way to determine the set of events that stand in relation S to b. As far as the unprimed frame of reference is concerned, we have *Sbp*. In the primed frame, however, we find that ¬*Sbp* but *Sbp'* . Since S is an equivalence relation, and hence transitive, whichever events stand in S to events which stand in S to b should also stand in S to b. If the qualification that whether two events stand in S or not can only be determined with respect to a frame of reference is omitted, then the transitivity of S seems to entail that, since there exists an event q such that S *bq* (in some frame) and S *qc* (in some (other) frame), it is the case that S *bc*. See Figure 2 for an example of such an event q, with b and c related as in the left-hand side of Figure 1. But this is absurd: S is supposed to be a relation of simultaneity, yet c is clearly to the future of b! That c is to the future of b, importantly, is frame-independent and hence agreed on by all inertial observers. But if it is absolutely and objectively the case that c is to the future of b, they cannot stand in any relation that can sensibly be interpreted as a relation of simultaneity.
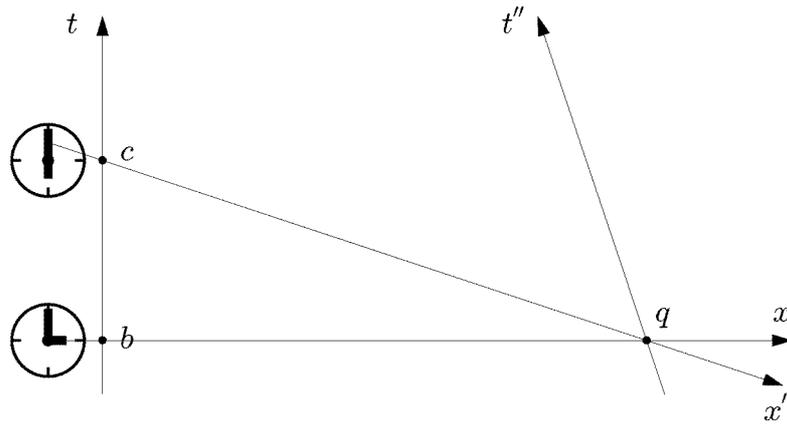
Figure 2: What the transitivity of simultaneity can do: $S\,bq$ in the unprimed frame, $S\,qc$ in the doubly primed frame

Note that the absurdity is rampant: for any pair of events a and b in the manifold M of Minkowski spacetime, there exists an event $c \in$ M such that $S\,ac$ and $S\,bc$ and hence $S\,ab$. Hence, S is the universal binary relation on the set of events M. But surely a presentist would not want to be bound by an ontological commitment to all events in spacetime. From this consequence, both Rietdijk and Putnam have concluded that any metaphysical position marking ontological distinctions along a relation of simultaneity is thus reduced to absurdity.

Of course, one might interject that to let the transitivity of S act across different reference frames is illicit; the central lesson of the relativity of simultaneity in SR is that such transitivity only obtains within the same reference frame. In fact, while simultaneity remains an equivalence relation, it might be argued, once we accept the Lorentz symmetry of SR it does so only within each frame. If this point is heeded, it might then be concluded, the argument above no longer goes through. True, but to concede that the transitivity ought to be restricted to within the same reference frames and hence that simultaneity is equally restricted to reference frames surely seems to concede too much as far as the presentist is con-

cerned. After all, presentism relies, it seems, on an absolute notion of simultaneity in order to make absolute ontological claims.

Without going into the details of presentist responses to this challenge just yet, let us also note that it won't suffice for the presentist to merely reject the way of constructing a spatially extended present as offered in this section. The presentist might be tempted to argue that the argument presented here does not even get to the starting block as the idea of starting out from some privileged or arbitrarily chosen spacetime event (the 'here-now') and then trying to identify those events simultaneous to it. Instead, she might be tempted to think, the present and what is contained in it is primitively given, it is there 'at once', prior to us doing any physics. But suppose that's the case. It would then still be true that, if you hand me just one event as being an element of the present (or, *eo ipso* according to the presentist, of physical reality), the set of all primitively given elements of the present would form a three-dimensional submanifold of Minkowski spacetime containing the one starting point. I don't see how this move does not amount to privileging one particular way of carving up spacetime into equivalence classes of simultaneous events and, furthermore, of privileging one particular such equivalence class as the 'present', be that primitive or not.

The presentist might retort that this way of conceiving of the problem does not get started if we don't help ourselves to this one event from which we subsequently try to construct the rest of the present. But surely, she might continue, the positing of such a vantage point is wrongful, at least without some further motivation. True, if this opening move is barred, the challenge can't be constructed as above. But I fail to see what the presentist could win from disallowing it. She would claim, in essence, that all and only present events and objects are part of physical reality *and* that there is in principle no way of determining even one element of this physical reality. Lest we permit ourselves to lapse into obscurantism, the presentist ought to accept the challenge as it stands—particularly given the plethora of more interesting responses available to her.

3. A taxonomy of presentist responses to the challenge

Let us then consider and classify actual, and possible but unstated, presentist responses to the argument as outlined in Section 2. The basic distinction I wish to use in systematizing presentist reactions is that between compatibilism and incompatibilism between presentism and SR. Versions of *compatibilism* with SR assert that, despite appearances, SR and presentism are perfectly compatible in that they can jointly and consistently be maintained. Juxtaposed, we find varieties of *incompatibilism* with SR, which accept the argument as given in §2, but reject that it entails the denial of presentism. Clearly, then, an incompatibilist of this kind is thus obliged to reject SR. For some, such a move is justified on the background of their rather sweeping rejection of physics as a science whose task it is to unveil facts about our physical world that a philosopher ought to take into account when constructing metaphysical theories. But there are others in this camp who, while rejecting SR, are adamant about dismissing such an attitude of wholesale rejection of physics as being irrelevant to the task at hand. For them, a metaphysics blatantly contradicting our best physical theories is indefensible. An incompatibilist of this sort, then, has to deny that SR, at least as standardly understood, is among our best physical theories.[55]

In order to make room for this additional distinction, it seems sensible to distinguish between more encompassing forms of both compatibilism and incompatibilism, not just with SR, but with modern physics *in toto*, i.e., with contemporary, or in fact prospective, fundamental physics. Since it is at least logically possible to sever the two distinctions and be, e. g. , an incompatibilist with respect to SR but not modern physics in total, they are strictly speaking orthogonal and give rise to a two-by-two matrix of four distinct types of presentist strategies in the face of the challenge mounted in §2, as follows:

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[55] Note that, as will subsequently become clear, what exactly SR is taken to assert or entail will be of paramount importance when judging the (in)compatibility of presentism with it.

	compatibilism with SR	incompatibilism with SR
compatiblism with modern physics	presentism compatible with both SR and physics	presentism incompatible with SR, but compatible with physics
incompatibilism with modern physics	presentism compatible with SR, but incompatible with physics	presentism incompatible with both SR and physics

Table 1: The matrix of distinct types of presentist strategies

While all four options are logically possible, it is evident that they are not all equally attractive. The lower left box in Table 1, for instance, has not been defended in print, to the best of my knowledge. This is hardly surprising, for why should a presentist go at any length establishing compatibility with SR, only to then concede that it remains incompatible with fundamental physics. If a defender of presentism estimates her theory to be in conflict with fundamental physics, why spend any effort to defend its consonance with SR? Such a strategy would therefore only appear to be rational, it seems, if one believed that the irreconcilability of presentism with other theories in physics can be dispelled in ways that one with SR could not. But there is no reason to believe that *that* is the case: as will become clearer below, the reason why theories in fundamental physics clash with presentism, if any, is that we ask them to respect the Lorentz symmetry demanded by SR. In a sense, then, the conflict arises because of, and to the extent to which, fundamental physics is required to be special-relativistic. It seems odd, then, to argue for a compatibility of presentism and SR, while maintaining a discordance between presentism and other theories in fundamental physics. Consequently, I will not consider potential presentist responses that would fall in the lower left quadrant of Table 1 any further.

What about the box on the lower right-hand side? The acceptance of a conflict between presentism and not only SR, but all of

current, as well as prospective, fundamental physics paired with an insistence on presentism amounts to a rather comprehensive rejection of physics. It thus fundamentally contravenes naturalism, a venerable tradition going back at least to Aristotle. According to naturalism, philosophical—and metaphysical—inquiry is continuous with scientific inquiry. To be sure, naturalism is not a logical truth—it is a substantive philosophical thesis. But it is one whose defence has to wait for another day; for present purposes, I simply assume a minimal naturalism which demands that no philosophical thesis be in manifest contradiction to facts established by our best science. Restricting this weak thesis to metaphysics, it can be translated as necessitating that the physically possible worlds are a subset of the metaphysically possible ones, for if the metaphysical theories were in contradiction to the physical ones, then there would have to be some physically possible worlds (and perhaps all) which are metaphysically impossible, as for the metaphysical theory to be incompatible with physics, it would have to rule out some physically possible worlds as impossible.[56] In other words, metaphysics would a priori deem impossible what physics affirms is possible. Assuming that all physically possible worlds are also logically possible, I see little justification for disavowing this weak form of naturalism.

In what follows, I shall hence assume that the most attractive presentist strategies are to be found in the camp espousing compatibilism with fundamental physics. This leaves us with the top two boxes of Table 1, and thus with either compatibilism or incompatibilism with respect to SR.

4. Compatibilism with special relativity

There are various ways in which one could work out a compatibilist response (regarding both SR and physics in general). An

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[56] Of course, this also presupposes that the "facts established by our best science" get translated as those facts compatible with the laws of our best physical theories.

obvious way to do so would be to accept a modification of the presentist position such that the reformulated thesis is compatible with Lorentz symmetry. Although this would not by itself guarantee that the reformulated position is compatible with any future fundamental physical theory, it would remove any immediate reason for believing that it couldn't be. Of course, given that we do not currently have at our disposal the final and true fundamental theory, it would be illusory to seek such a guarantee. Thus, a compatibilist must content herself with making an informed bet on which parts of our current physics are likely to be retained, in a sufficiently similar form, in the final theory. Accordingly, the modifications required for compatibilism can only conform to what our currently best judgments concerning this are.

Apart from modifying the presentist thesis, there are, broadly speaking, at least two further ways for the full compatibilist to work out an answer. As a second option, one can argue that SR, and any other relevant physical theory, are not about time, or at least not about the same sort of time as the presentist is concerned with. Since their objects are thus distinct, there could not possibly be an inconsistency between presentism and physical theories. Hence, they are perfectly compatible; and since this reasoning applies to any future physical theory, this argument concludes, we can remain happy compatibilists until the end of time.

The third—and surprisingly popular—option denies that SR, properly interpreted, involves or entails an assertion to the effect that there cannot be any absolute, i.e. observer-independent, simultaneity relation S. In fact, proponents of this strategy insist, what SR does prohibit is only that any such absolute simultaneity could not be detected in principle and would hence remain empirically completely inaccessible. Thus, SR does not preclude the existence of an absolute, non-empirical S. Since such an S does exist, though undetectably so, there is no problem in identifying the spatially distant events which are co-present with the *here-now*. To be sure, this identification cannot be executed in practice, as S must remain behind a principled veil of ignorance, but the possibility that it exists assures the presentist that there can be a privileged simulta-

neity relation and thus an objectively distinguished present. So if SR is interpreted as to only imply that there cannot exist an absolute S which can also be detected, but not to entail that there cannot be an absolute non-empirical S , then presentism remains compatible with SR and arguably with all of physics.

In sum, then, it appears as if the compatibilist can select among three different routes: either insist that SR and presentism talk about different things and hence cir-cumvent the issue of compatibility, or modify presentism such as to eliminate any tension with SR, or re-interpret—and arguably modify—SR such that it no longer entails that there cannot be absolute non-empirical simultaneity. Let me discuss these options in some more detail.

The first road claims that SR, unlike presentism, is not really a theory about 'time', in spite of any appearances to the contrary. Perhaps the most prominent proponent of this view was Arthur Prior. We find the clearest expression in one of his posthumously published essays:

> [W]e may say that the theory of relativity isn't about *real* space and time, in which the earlier-later relation is defined in terms of pastness, presentness, and futurity; the 'time' which enters the so-called space-time of relativity theory isn't this, but is just part of an artificial framework which the scientists have constructed to link together observed facts in the simplest way possible, and from which those things which are systematically concealed from us are quite reasonably left out. ([Prior 1996], 50f, emphasis in the original)

Prior claims, in effect, that the 'time' in SR is of merely instrumental value, used in physics as an ordering parameter of in principle observable events. Real time (and space) which are defined relationally in terms of pastness, presentness, and futurity, he implies, is systematically concealed from us, as of course it has to on pains of violating the Lorentz symmetry demanded by SR. His implication that there is, ontologically speaking, an absolute

and objective fact of the matter where events stand in terms of their pastness, presentness, and futurity, even though this fact must remain forever invisible to us, comes awfully close to the third way of giving a compatibilist response as I have sketched it above. In fact, more than a score years earlier, though still posthumously, Prior wrote that

> [o]ne possible reaction to this situation, which to my mind is perfectly respectable though it isn't very fashionable, is to insist that all that physics has shown to be true or likely is that in some cases we can never *know*, we can never *physically find out*, whether something is actually happening, or merely has happened or will happen. ([Prior 1972], p. 323, emphasis in the original)

It is obvious why this view is not as fashionable as perhaps Prior would have hoped (although it's still surprisingly popular): it constitutively asserts what can-not be known. Even though Prior seems insufficiently impressed by this principled ignorance—he believes it to only apply to "some cases"—, it is important to empha-size just how generic it is: although we can determine events in the past lightcone of the *here-now* to be past as causal signals emanating from them can in principle reach the *here-now*, no spatially distant event can ever be known, or "physically found out", to be present. The only event of which we can ascertain its presentness, and hence, according to the presentist, its very existence, is the *here-now*. Hence, the principled epistemic strictures imposed by SR are much more constraining than Prior seems to realize.

It should also be stressed that Prior seems to accept the challenge as it has been set up in §2, as whether a spacelike related event is co-present with the *here-now*, "[o]n the view of presentness which [he has] been suggesting, this is *always* a sen-sible question. " [Prior 1972] (p. 322; emphasis in original) The task, according to him, is exactly to identify a relation not just of simultaneity with respect to a frame of reference, but of simultaneity *tout court*. Thus, Prior accepts the challenge as it stands and appears to vacillate in his response between saying that SR and presentism

refer to different things when they state 'time' and thus cannot be incompatible, and saying that SR leaves open the possibility of an absolute, non-empirical relation of simultaneity. These responses need not be different, of course. Properly disambiguated, for instance, the different referents of 'time' on the first view entails different referents of 'simultaneity' and in this sense the first view entails the third view held by the earlier Prior. Conversely, however, one could certainly maintain the third view without any commitment regarding the first view.

One who defends the third view without apparent commitment to the first view is John Lucas ([Lucas 1989]). Lucas also maintains that presentism does not violate any of the empirical consequences of SR and is thus compatible with it by pointing out that "[t]he divine canon of simultaneity implicit in the instantaneous acquisition of knowledge by an omniscient being" (220) is perfectly compatible with SR, as there may be "a divinely preferred frame of reference" (ibid.).[57] Theology aside, the idea is to stipulate unobservable extra-structure in the form of an absolute simultaneity relation in order to satisfy an appetite dictated by a metaphysical agenda. Many presentists defend versions of this response, among them Ned Markosian ([Markosian 2004], [§3. 9]), and Dean Zimmerman ([Zimmerman 2008]), even though Markosian's stance is less committal concerning what exactly SR does or does not entail. In fact, Markosian only asserts the disjunction that either this third compatibilist view is correct or else SR entails that there cannot be such an absolute simultaneity relation, in which case, however, SR must be rejected on incompatibilist grounds and based on "good *a priori* evidence" (75). Zimmerman accepts that SR encodes the geometry of spacetime, but denies that this entails any ontological consequences. In particular, nothing in SR prohibits an absolute non-empirical simultaneity relation whose existence Zimmerman asserts.

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[57] A later incarnation of Lucas, found in [Lucas 1999], defends an incompatibilist version of a similar idea by affrming an in principle observable preferred frame. I will return to this in §5.

If this stipulation of extra-structure is motivated purely by a presentist metaphysics, we better have very good reasons for believing presentism. The usual justifications for presentism trade on intuitions allegedly grounded in common sense which are said to powerfully demand that only presently existing things really exist. I, for one, only have weak intuitions regarding these matters; so weak that they are easily trumped by reasoned argument. But suppose another philosopher's intuitions are so strong as to warrant this step. Still donning our naturalist hat, it seems odd that many hu-mans would have evolved intuitions that must depend on a structure which cannot be detected in principle. So either philosophers overestimate the extent to which hu-mans have intuitions of the requisite kind or else these intuitions do not ontologically depend on an ultimately unobservable extra-structure such as absolute simultaneity. Most likely, of course, these intuitions—to the extent to which we have them—arose as an adaptation useful for beings operating at human scales, with the slow motions predominant in our empirical world.

Returning to the first view, according to which SR and presentism simply talk about different things, the main problem it confronts is a tenacious charge of obscurantism: if the time presentism speculates about is distinct from that which SR, and physics quite generally, theorizes about, what then is it? The time of physics is that which is tracked by any physical clock, from atomic clocks to biological and astronomical ones. The presentist's time, on the other hand, cannot possibly find any expression in the physical realm; for if it did, we could observe its regularities and compare them to other physical ones. Unless it would show a violation of Lorentz invariance, however, these regularities would have to accord to the Lorentz symmetry postulated by SR and would thus lead the presentist back to the challenge as given in §2. In case it *did* violate Lorentz invariance, we would have found an empirical confutation of SR. This, in turn, would signal not a compatibility of presentism with SR, but that new physics was required. Indeed, the presentist would find herself in the top right box of those who resolve the tension by showing that while presentism is incompatible

with SR, it is perfectly consistent with more fundamental, 'better' physics. I shall turn to resolutions of this type in §5.

Time, therefore, must remain obscure on this view.[58] Furthermore, Gerald Massey ([Massey 1969]) accused Prior's programme of tense logic and presentism to be "grounded in bad physics and indefensible metaphysics" (31f). Yet, despite this, and arguably because of its many ingenious innovations that even Massey acknowledged, Prior's presentism continues to be influential. Jonathan Lowe, in his contribution to this collection [Lowe 2013], seems to defend a similar line to Prior in his first comment of Section III, where he insists that we only get from the merely operational definition of time as found in physics to the conclusion that this characterization does really track *time* by additional metaphysical premises. These ancillary assumptions needed for the interpretation of the formal theoretical structure of SR can be chosen in different ways; in particular, Lowe maintains, they can be chosen as to permit metaphysical systems with absolute time and absolute simultaneity. Again, it is hard to see how this resolution avoids obscurantism.

What Lowe really believes is that a presentist can accept SR's stricture that there cannot be absolute simultaneity, as his further comments show. The way to evade the grip of the challenge, for Lowe, is to deny that co-existence is an equivalence relation. In the classification scheme proposed here, this resolution falls under the second compatibilist view, which now remains to be discussed. There are, of course, many ways of modifying presentism such as to keep it in line with SR. One important group of modifications denies that co-existence is an equivalence relation. As violating reflexivity is not attractive, approaches in this camp either deny symmetry or transitivity. Lowe proposes to violate transitivity, as he believes the demand that co-existence is transitive constitutes a

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[58] That Priorian presentism trades on the obscure is ironic, given that [Prior 1967], p. 160, accused eternalists (or, more precisely, detensers) of "superstition" because they "pretend not only to resurrect the dead but even to summon forth the unborn", in the words of [Massey 1969], p. 23.

metaphysical assumption motivated by an eternalist understanding of temporal reality that the presentist naturally rejects. As he most specifically explicates in comment (c) in Section III, transitivity ought to be rejected because on the endurantist conception of persistence he maintains, a person is wholly present at all times he or she exists, and co-exists with particular tropes of hers at each of these times, while the tropes of hers instantiated at different times do not co-exist.[59] This last point is a distinctively presentist thesis, and insisting on the transitivity of co-existence amounts to an eternalist prejudice in that it is assumed that the tropes at different times co-exist—or so he claims.

Let me first note how unpalatable giving up the transitivity of co-existence really is. Without transitivity, it seems impossible to have a determinate and objective fact of the matter as to what the sum total of existence is. Existence seems relativized if I have to accept that what exists relative to b may not exist relative to a, even if b exists relative to a. We will soon see a more radical version of a proposal along these lines, but I find Lowe's proposal unattractive because it appears to have significant costs in the currency of the objectivity of existence, while it may not resolve the difficulties originating in SR at all. The reason why I am sceptical of its efficacy of eliminating the tension is that it seems as if at the level of *tropes*, transitivity is still required. If so, the problem returns in an unmitigated form.

But why would the transitivity of co-existence be necessary for tropes? Suppose there are three people, Alice, Bob, and Carol, pairwise at some spatial distance from one another, but mutually at rest. In the metaphysical picture drawn by Lowe, all three constitute a series of tropes with which they co-exist, sequentially, at subsequent times. This much seems unproblematic, since for one (idealized) observer, time forms a total order even in a relativistic context. But now it seems as if there ought to be a fact of the matter which 'Alice'-tropes co-exist with which 'Bob'-tropes, etc.

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[59] A *trope* is a particular instance of a property or a relation, holding of, or co-existing with, the concrete particular it characterizes.

Suppose that the Alice-trope A co-exists with the Bob-trope B and that the Bob-trope B co-exists with the Carol-trope C. Does A co-exist with C? If so, without loss of generality, it seems as if at least within the same frame of reference (remember that the Alice, Bob, and Carol are mutually at rest), co-existence ought to be transitive if the relata are tropes—at least there seems no reason why it shouldn't be. Idealizing the tropes as being located at one space-time point, SR mandates that if A, B, and C are simultaneous (and hence co-exist) in the rest frame of Alice, Bob, and Carol, then they will not be simultaneous in any other frame. And it is not the case that this rest frame is privileged—it could have been the case that the three observers move relative to one another. Suppose that Bob and Carol start to move relative to Alice and relative to one another, even though they still move inertially. So within Alice's rest frame, which is the same rest frame as the one we had before and for which we established transitivity. But since Alice is in no way preferred over Bob or Carol, the same should be true for their rest frames. Hence, within each observer's rest frame, the transitivity of co-existence with tropes as relata should be valid. It may, however, not obtain *across different* frames, at least there is nothing in SR which would decide this matter. Either it does or it doesn't. If it does, then we are back to square one and the challenge still stands; if it does not, then the presentist accepts that existence gets fragmented and relativized to reference frames. The presentist of a Lowean persuasion finds himself between a rock and a hard place.

None of this should suggest that a presentist couldn't respond to the challenge by accepting the lessons of SR and, accordingly, relativize existence to inertial frames, as does Kit Fine ([Fine 2005], §10, 298–307). Simultaneity, and hence co-presentness, is defined only relative to an inertial frame. Therefore, and since for the presentist existence is tied to co-presentness, existence becomes fragmented in that it is only determinate with respect to a frame of reference. Co-existence is only an equivalence relation with respect to an inertial frame, but not *simpliciter*, as transitivity cannot act across frames. The price to be paid for this perfectly straightforward resolution, however, is immense: it requires a radi-

cally new understanding of physical existence. On a standard conception of physical existence, I take it, what exists is independent not only of the subject, but also of its kinematic state. On Fine's view, what co-exists with me depends on how I move. Thus, if we meet in the street, leisurely walking towards one another, what co-exists with you is entirely and completely different from what co-exists with me (with the exception of the *here-now*). Fine insists that this is a feature of his view, not a bug; but it is a feature which seriously modifies our conception of physical existence. Many presentists, I would think, are unwilling to follow Fine in this radical step.
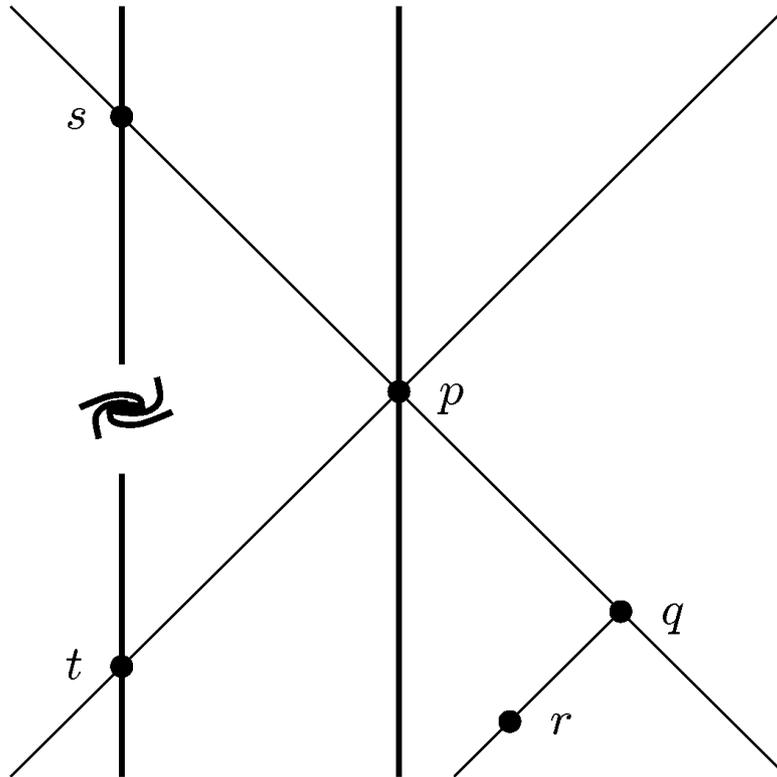
Figure 3: An illustration of the violation of transitivity and of the insistence on symmetry in past-lightcone presentism

There are other ways to deny that co-existence, or co-presentness, is an equivalence relation. One is suggested (but not ultimately defended) by Howard Stein ([Stein 1991]) and could be termed *past-lightcone presentism*. Past-lightcone presentism consider all and only events on the past lightcone of the *here-now* as co-existing with the *here-now*. Clearly, co-existence thus becomes non-symmetrical, as is evident in Figure 3: q co-exists with p but not vice versa.

The loss of transitivity is also manifest: r co-exists with q, and q co-exists with p, but r does not co-exist with p because it is not *on* the past lightcone, but *inside* it. To save transitivity by including the full past lightcone of p as co-existing with p should not appeal to a presentist, unless she secretly harbours sympathies for the growing block view. The symmetry, but not the transitivity, of co-existence can be restored by extending the set of events which stand in the co-existence relation to p to include those events on the *future* lightcone. Thus, if q co-exists with p, so does p with q. Such an extension, however, would have one rather counterintuitive consequence (cf. Figure 3): for a distant galaxy at rest relative to an observer on earth, events s and t far apart in time (e. g. some four million years for Andromeda), but not in space, would both co-exist with the present event p for the earth-bound observer. This seems a rather odd outcome for a presentist; I suspect that most past-lightcone presentists would therefore refrain from saving symmetry.

Let's tally the benefits and costs of past-lightcone presentism. First, this species of presentism is clearly compatible with SR as it defines the metaphysically salient structure purely in the Lorentz-invariant terms of the lightcone structure of spacetime. As a second advantage, co-existence tracks epistemic accessibility: all those events co-exist with the *here-now* which can be causally connected to (but not from) the *here-now*, e. g. by a light signal; consequently, all those events co-exist with the *here-now* which can be seen, at the *here-now*, as occurring now. While these virtues are not insignificant, they are outweighed by the approach's problems.

First, it is questionable to what extent it deserves the moniker 'presentism' as it includes as co-existent with the *here-now* events reaching arbitrarily far back into the past. There are events all the way back to, but not including, the big bang which co-exist with the *here-now*.[60] Moreover, past-lightcone presentism requires the unjustified awarding of a privilege of the spatially present over other spatial locations. The imposition of a prerogative of the *here* is implicit in the position because of the unique role played by the apex of the lightcone. The past lightcones of two distinct spacetime points are generally distinct.[61] Selecting one past lightcone as that which contains events enjoying an ontological distinction over the others thus means to *spatiotemporally* privilege a location—and not just *temporally* as the presentist routinely does. Space and time are thus treated much more on a par than may be usual, or desirable, for a presentist. While presentists go at great lengths offering a justification for distinguishing the present, the pastlightcone version of presentism would only be appealing, counterfactually, if similar justifications could be offered for the prerogative of the *here-now* as for the *now*.

The one remaining compatibilist presentism I wish to discuss also modifies the original position, but in rather different ways. James Harrington ([Harrington 2008]) has defended a 'pointilliste' version of presentism according to which not only is the sum total of existence restricted to the temporally present, but it is also limited to the *spatially* present. This point presentism evidently relies only on the Lorentz-invariant structure of relativistic spacetimes: single points. Thus, the challenge mounted in §2 does not even get to the starting blocks. This solipsistic version of presentism, however, is a very lonely view indeed: not even all of me exists! Furthermore, solipsist presentism fails to capture the spirit of presentism, as [Fine 2005] (p. 304) reminds us, which maintains that

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[60] Thus including events located at all cosmological times from arbitrarily close to the big bang to today. In the standard cosmological models of Friedmann-Lemaître-Robertson-Walker spacetimes, these cosmological times are privileged against all other ways of foliating these spacetimes; cf. §5.

[61] Except if the spacetime lacks a property called 'past-distinguishing'.

there is a metaphysically deep distinction between space and time in that there exists an objective 'now', even though there is no equally objective 'here'. Finally, and relatedly, a justification for privileging this rather than that spacetime point is required, just as it was for the past-lightcone presentism.

Summarizing our findings of this section, we can safely reject the claim that SR precludes a presentist metaphysic. Presentism is not physically impossible according to SR. Even assuming the strict truth of SR, there are many ways in which a presentist can evade the pressure originating from the relativity of simultaneity. All of these ways, however, incur certain costs; costs that are, in my view, too high to justify any potential gain they might offer.

5. Incompatibilism with special relativity

There is almost universal agreement that SR is not a true theory. It assumes the complete absence of gravity, for instance. Because gravity shapes the structure of space-time, the Minkowski space-time we find in SR cannot adequately describe the space-time structure of the world we live in. Furthermore, SR does not take any quantum effects into consideration. If a naturalistically in-clined presentist presented an argument from some physical theory better than SR that would establish that the challenge produced in §2 would no longer go through, she would offer respite for presen-tism from the besieging relativity of simultaneity. Arguments of this type count as incompatibilist because they accept the verdict from §2, but try to overturn it by rejecting SR. It is important to note that SR is not simply rejected on a priori or otherwise anti-naturalist grounds, but instead because it is believed to be an ulti-mately false theory of the actual world, to be replaced by a better theory. This naturalist assumption dictates the rules for this section: any presentist opting for this route must produce at least an equally good (interpretation of a) theory on which the problem vanishes, where 'good' is judged by the standards of physical science. This means that the metaphysician must get her hands dirty and analyze some actual physics. Such an analysis very quickly leads into a

thicket of foundational questions in special and general relativity, quantum mechanics, quantum field theory, and quantum gravity. Naturally, I cannot possibly cover all the possible physics on which such an incompatibilist argument could turn in the remainder of this essay, but I will try to give you a sense of where to look and how such an argument might go.

The physics invoked, or reinterpreted, by the naturalist incompatibilist is either classical, i.e. non-quantum, or it relies on some quantum effects to get around SR's stricture of the relativity of simultaneity. Today, I shall focus on some 'classical' strategies and only briefly comment on some quantum considerations towards the end of the essay. Among those, either a reinterpretation of SR, or the identification of extra-structure in general relativity (GR)—a more fundamental theory than SR— are most promising. One rather popular strategy of the first type, found e. g. in William Craig ([Craig 2001]), seeks a 'neo-Lorentzian' reinterpretation of SR. Emulating Hendrik Lorentz's postulation of an immobile aether, it introduces a preferred frame of reference just as the aether would have done. Often, however, proponents of this strategy desist from offering a particular physical mechanism such as the aether which would physically explain the privilege awarded to one frame in particular. The important point, of course, is that it is in principle impossible to detect the preferred frame. Mathematically speaking, this fact gets encoded in the strict validity of Lorentz symmetry, which still obtains. This strategy is the identical twin of the compatibilist strategy of insisting that SR is compatible with the postulation of extra-structure as a preferred frame. The only difference here is that the standard reading of SR is assumed to prohibit such extra-structures, and hence rejected and supplanted by a neo-Lorentzian version which includes the preferred frame. Ultimately, whether this strategy is considered compatibilist or incompatibilist thus boils down to the issue of whether SR permits grafting on the extra-structure of a preferred frame, as we have already seen e. g. in the strategy employed by [Markosian 2004]. I take no stance on this essentially semantic question but will henceforth use the term 'SR' to include a prohibition of any preferred

frames and 'neo-Lorentzian SR' to designate SR-cumpreferred frame.

Against the twin strategy of adding an absolute, non-empirical simultaneity it can be complained, as I did above, that it violates the demands of Ockam's razor by postulating excess entities whose effects cannot even in principle be detected. Apart from the charge that it relies on unnecessary entities, neo-Lorentzian SR seems to make the Relativity Principle mentioned in §2 only accidentally true. While the Relativity Principle is of course not metaphysically necessary, let me emphasize that neo-Lorentzian SR retracts what many consider SR's major accomplishment, viz. to show that not only is the Relativity Principle a deep principle of fundamental physics, but it can consistently be maintained alongside another successful empirical generalization: the Light Postulate. Furthermore, standard SR and the view of spacetime it promulgates lend themselves—unlike neo-Lorentzian SR—quite naturally to the development in understanding spacetime brought about by GR. In the realm of GR, which liberally admits many spacetime geometries and even topologies such that, in general, space-times can no longer be carved up into slices of space ordered by time. Thus, in those worlds at least where such a foliation is not possible at all, we do not even *get* to the problem of having to privilege one frame among infinitely many for no good empirical reasons—there simply are no such global frames anymore. In other words, Neo-Lorentzian SR seems to exhibit all the vices of ad-hockery and none of the virtues of ex ante, testable explanations with independent support. Neo-Lorentzian theories are driven either by a refusnik attitude towards the lessons of SR or by some more explicit metaphysical agendas; either way, they make for bad physics. As long as we are constrained to the non-dynamical Minkowski spacetime, there is no good reason to adopt a neo-Lorentzian preferred frame. But new possibilities open up once the narrow confines of special-relativistic physics dehisce.

Staying within the classical incompatibilist camp though, a popular strategy utilizes the cosmological models of GR to reintroduce and justify a privileged time and thus an absolute simultane-

ity. Motivated by the idea that no location in space, including ours, is physically privileged (the so-called *Copernican* or *Cosmological Principle*), cosmologists assume that a necessary condition for the Copernican Principle to hold is that spacetime is spatially homogeneous. A theorem ([Walker 1944]) establishes that a sufficient condition for spatial homogeneity is the exact spherical symmetry around every point of the spacetime. The theorem also shows that if the condition of exact spherical symmetry about every point is satisfied, then the spacetime can be foliated into spacelike hypersurfaces of constant curvature. Spacetimes which exhibit exact spherical symmetry about every point are the Friedmann-Lemaître-Robertson-Walker (FLRW) spacetimes mentioned in footnote 10. The foliation into spacelike hypersurfaces they admit is unique in that for only one such foliation it is the case for each hypersurface that all points in it exemplify the same spatial curvature. The foliation is thus physically privileged, and the parameter which orders the folia is called *cosmological time t*. Thus, the FLRW spacetimes—the cosmological standard models—admit an absolute time and an absolute notion of simultaneity: two events are *FLRW-absolutely simultaneous* just in case they are within the same spatial hy-persurface of the privileged foliation or, equivalently, occur at the same cosmological time *t*. This notion of simultaneity is absolute since for any two events in an FLRW spacetime it is either the case that they are FLRW-absolutely simultaneous or not.[62]

The move from SR to GR thus seems to reinvigorate the naturalist presentist's enterprise. As already James Jeans ([Jeans 1936]) recognized, with apparent relief, the FLRW spacetimes make "a real distinction between space and time", such that we have "every justification for reverting to our old intuitional belief that past, present, and future have real objective meanings, and are not mere hallucinations of individual minds—in brief that we are free to believe that time is real. " (p. 23; cited after [Lockwood 2005], p. 116f.) Many presentists have followed Jeans in imbuing cosmological time with ontological significance. But this move is not

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[62] For a more systematic account of FLRW spacetimes, cf. e. g. [Wald 1984], Ch. 5.

without its shortcomings. Michael Berry ([Berry 1989], p. 105) resists the inference from the fact that there is a uniquely most natural reference frame for FLRW spacetimes—the one at rest with respect to the local matter of the universe averaged over vast distances— to the conclusion that there is absolute space and time. I concur with Berry, but let's consider some more specific problems of the Jeansian proposal.

An immediate problem already noted by Kurt Gödel ([Gödel 1949]), p. 560n, is that relying on cosmological time to define absolute time seems to yield only an approximate definition. It can only provide such an approximation because the assumptions undergirding the FLRW spacetimes are idealizations; of course, our actual universe is embarrassingly obviously *not* spatially homogeneous. In fact, it is hard to imagine how life would be possible in a perfectly homogeneous universe. So at small scales, we find blatant inhomogeneities. The question thus arises at which scales the idealizing assumption of spatial homogeneity is valid within the limits demanded of the approximation. This is Gödel's point: at no scale smaller than the full universe have different spatial regions in general the exact same average spatial curvature; thus, to make the definition precise, either nothing short of the full universe will work, or else arbitrary elements "such as the size of the regions or the weight function to be used in the computation of the mean motion of matter" (ibid.) must be introduced. Judging from this, Gödel found it "doubtful whether there exists a precise definition which has so great merits, that there would be sufficient reason to consider exactly the time thus obtained as the true one. " (ibid.)

To use an analogy from Michael Lockwood ([Lockwood 2005], p. 118), just as the surface of earth is idealized as a perfect sphere, or as a perfect oblate spheroid, when in reality it is, at least from up close enough, a rocky asteroid, the hypersurfaces of FLRW spacetimes are idealized to be perfectly homogeneous when in actuality they are, at least from up close enough, rather inhomogeneous. The equivalence classes of FLRW-absolutely simultaneous events thus rely on an idealized division of space and time which may locally well be violated. In all this, it remains utterly

mysterious how this highly idealized construction connects to our intuitions regarding temporal becoming and the present. If the absolute time constructed from this idealizing averaging procedure over vast cosmic scales is the time which determines what is the present, then how does the human perceptual and cognitive apparatus latch on to this idealized structure? In order for us to have truthful intuitions regarding the present, as a necessary condition, there must be a causal story of how humans pick up the present so defined. There are reasons to believe that such a causal mechanism cannot operate even in principle—after all, the spacelike hypersurfaces of constant spatial curvature which define the present extend across all of the universe and include parts from where light signals can only reach earth in a few billion years. Clearly, our presentist intuitions, should we have them, must be generated in a different way.

That this will not be trivial to resolve can be gleaned from explicating a useful distinction between 'public' and 'private' spaces made by Wolfgang Rindler ([Rindler 1981]).[63] Both public and private spaces are spacelike hypersurfaces of a four-dimensional general-relativistic spacetime. Consider an infinite number of test particles whose trajectories are timelike geodesics. A *private* space then is a spacelike hypersurface generated by (spacelike) geodesics which are orthogonal to the timelike curve of a particular test particle. This is, at it were, the test particle's own private 'space', viz. the space orthogonal to its 'time'. A *public* space, on the other hand, is a spacelike hypersurface which is everywhere orthogonal to a family of timelike curves. Restricting ourselves to the case of 'open' FLRW spacetime (i.e., the spatial curvature at events in the hypersurfaces of constant spatial curvature is non-positive), the so-called Pen-rose diagram given in Figure 4 gives a graphical illustration of the difference between private and public space.

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[63] The distinction originated in Edward A Milne's discussion of his eponymous spacetime, but was generalized by [Rindler 1981]. I thank David Malament for teaching this material to me.
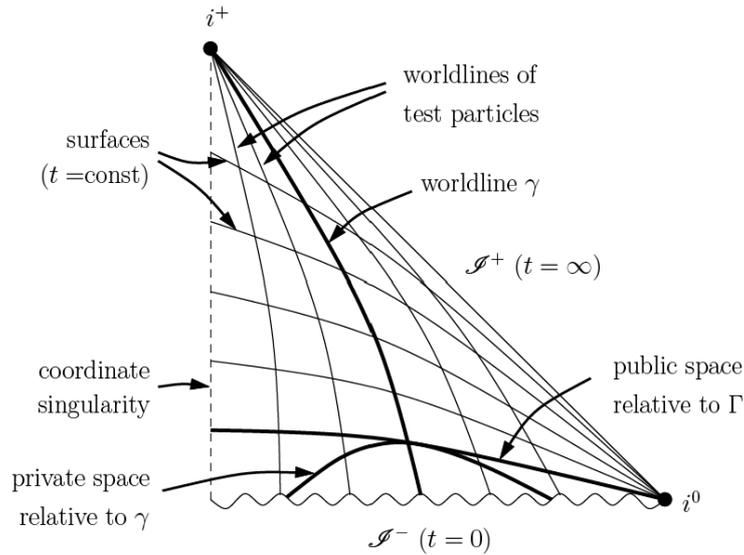
Figure 4: Penrose diagram of an open FLRW spacetime (with p =Λ= 0) with a family Γ of worldlines of test particles

A Penrose diagram represents the conformal structure of a spacetime, i.e., a way of representing the structure of an infinitely extended spacetime in a finite diagram. The straight boundary lines represent infinity, the wavy boundary lines a singularity, the dashed boundary lines symmetry axes or coordinate singularities, and points points. Boundary null surfaces are labelled f (read 'scri'), with f^+ and f^- representing future and past null infinity, respectively, and boundary points i, with i^+ and i^- designating future and past timelike infinity, respectively, and i^0 spacelike infinity. In Figure 4, any timelike geodesic originates in f^- and ends in i^+, and null geodesics start in f^- and finish in f^+, and spacelike geodesics originate and end in i^0. (But non-geodesic curves do not follow these rules).

Let us consider a family Γ of timelike geodesics representing the worldlines of test particles, as well as one particular representative γ of that family (cf. Figure 4). As indicated in Figure 4, the

public space relative to Γ at a given time $t = t'$ is just the spacelike hypersurface $t = t'$ of constant spatial curvature of the cosmologically privileged foliation. The private space relative to γ, however, only intersects this public space at the very point which jointly belongs to the worldline γ and the public space relative to Γ. It should be noted that both these spaces are supposed to represent 'space' as it is given at the same time $t = t'$, just once with respect to a family of observers or test particles and once for just one observer. The two notions of space are clearly inequivalent. In particular, the private space curves back onto the initial singularity f^- of the 'big bang', including arbitrarily early moments of cosmological time. A proposition by Don Page ([Page 1983]) establishes that private space is finite in any homogeneous and isotropic general-relativistic cosmological spacetime which is expanding (and satisfies certain other conditions).

Thus, the presentist is forced to disambiguate between the two notions of space. At most one of them correctly captures the structure of the spatially extended present. But which one to pick? Given that the presentist's original inclination was to utilize the cosmologically privileged foliation to re-introduce absolute simultaneity, the notion of public space seems more promising. It certainly commands the more objective validity in that it does not randomly, or at least unjustifiedly, select one worldline to fill a special role. In FLRW spacetimes, the public space also doesn't get arbitrarily close to the big bang, but instead tracks a more natural notion of simultaneity. Public space is only well-defined in spacetimes which do not rotate or, equivalently, for which there are families of worldlines such that the spacetime can be foliated into a family of spacelike hypersurfaces which are orthogonal to the worldlines.[64] Thus, the infamous Gödel spacetime does not permit public spaces. Perhaps this is not a big loss for the public-space presentist; but it does make presentism vulnerable to non-standard spacetime structures, which may well be actual for all we know.

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[64] Cf. David Malament, 'How space can be (and is) finite', talk at UCSD on 8 June 2009.

Would it be safer for the presentist to bet on private space as encoding the structure of the spatially extended present? After all, this seems what a finite, earthbound observer could hope to construct. It can often be constructed even in spacetimes in which no well-defined public space exists, such as in the rotating universes which fail to be hypersurface orthogonal. But we need not go far to recognize the weaknesses such a private-space-based approach would have. It is evidently egocentric as distant observers will never agree on what the present is, just as in the case of solipsist and past-lightcone presentisms. Strictly speaking, you and I will always disagree about which events are present. Symmetry (and transitivity) is lost again, as those temporal parts of you which are real according to *me-now* take a temporal part of me to be real which is in the causal past of the *me-now*. Since different observers have different private spaces, and only one of them gets the ontological privilege, a justification for singling out this, but not that, observer is again required. It is hard to see *how* such a justification could be forthcoming. Ironically then, private-space presentism unduly awards an ontologically special status to earthbound observers after having relied on modern cosmology whose Cosmological Principle exactly *denies* any special status to *us-now*.

There are two further repulsive features of private-space presentism. First, private spaces are not in general extendible to universal spaces, i.e., even for some causally benign spacetimes, they do not intersect the worldlines of all observers, so that some observers have no temporal parts which are ever real.[65] Second, and just as for past-lightcone presentism, in FLRW spacetimes part of an observer's private space will always be arbitrarily close to the big bang. This seems hard to reconcile with the presentist intuition that it is the present, not the past, that deserves the noble epithet of reality.

In sum, FLRW spacetimes offer a much less hospitable venue to a presentist metaphysic as the incompatibilist presentist may

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[65] More accurately, there exist private spaces in globally hyperbolic spacetimes which are not Cauchy surfaces.

have hoped. But not all classical hope is lost. As Bradley Monton ([Monton 2006]) has reminded us, GR contains a large class of spacetimes which seem amenable to a principled procedure for introducing unique foliations into space and time, one that even avoids the gross idealizations that paved the way to cosmological time. This procedure slices the four-dimensional spacetime into spacelike hypersurfaces parametrized by constant mean (extrinsic) curvature, or CMC.[66] I will spare you a detailed assessment of the prospects of presentism based on CMC foliations, as I have given one in [Wüthrich 2010]. But my conclusions there were negative: apart from numerous technical problems and from the callowness of the approach, the most devastating problem was even if the large-scale structure of our actual universe is best described by a spacetime which admits a CMC foliation, and even if one of the folia of this CMC foliation is rightly distinguished as the present, it remains far from clear, to put it mildly, how it can be that it is this CMC foliation that our presentist intuitions are tracking. Why should our sense that the present is somehow ontologically special be sensitive to the constant mean extrinsic curvature of spacelike hypersurfaces? Clearly, it is not enough to simply identify a folium of a certain constant mean curvature as the present and believe that one has explained our presentist intuitions.

While this seemingly exhausts at least the most obvious and the most viable classical strategies available to the incompatibilist presentist, many presentists have turned to quantum physics and have drawn new hope from several aspects of the quantum. Doing them the justice they deserve will have to wait for another day, so let me just list the two most obvious routes that have been pursued, with a few quick comments. They both concern particular interpretations of non-relativistic quantum mechanics, Bohmian mechanics and collapse theories. As an example of utilizing the latter, John

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[66] This curvature is defined as the trace of the extrinsic curvature, i.e., of a mathematical magnitude which quantifies how the three-dimensional hypersurface is embedded into the four-dimensional space-time. It thus differs from the purely three-dimensional, and hence intrinsic, 'spatial' curvature utilized in the introduction of the cosmological time in FLRW spacetimes.

Lucas ([Lucas 1999], p. 10) —a later temporal part of the compatibilist mentioned in §4—offers a forceful statement of how collapse interpretations provide a home for a physically distinguished present, adorned with the temporal asymmetry so beloved by presentists:

> There is a worldwide tide of actualization—collapse into eigenstate— constituting a preferred foliation by hyperplanes (not necessarily flat) of co-presentness sweeping through the universe—a tide which determines an absolute present [. . .] Quantum mechanics [. . .] not only insists on the arrow being kept in time, but distinguishes a present as the boundary between an alterable future and an unalterable past.

If the collapses invoked by Lucas are to be real physical mechanisms—which they would have to be in order to fill the role assigned to them by collapse presentists—, then they occur in a particular basis. For instance, in a GRW collapse theory, the collapses occur in the position basis. Whichever basis the collapse presentist chooses, her selection must be given a physical justification. I have no reason to assume that this can't be done, but would like to emphasize that it does not suffice to simply invoke collapse as a physical mechanism to distinguish the present and leave it at that. Furthermore, the collapses' blatant violation of Lorentz symmetry is usually regarded by physicists not as a metaphysical virtue, but as a physical vice. Therefore, physicists are searching for a relativistic version of collapse interpretations such as GRW. Such relativistic collapse theories should be expected to no longer rely on a preferred foliation of spacetime, but instead to collapse the wave function in a Lorentz-invariant way.[67] In fact, given alternative proposals to solve the measurement problem in quantum mechanics such as Everettian many-worlds theories and hidden-variables theories such as Bohmian mechanics, it is evident that quantum mechanics does not require collapse at all. Among those working

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[67] This is indeed what happens in the only current candidate for such a theory, [Tumulka 2006]'s 'rGRWf'.

in the foundations of quantum mechanics today, I would estimate that only a minority advocates collapse interpretations. The rejection of collapse interpretations, of course, does not entail an impossibility for the presentist to find a physical structure incarnating her metaphysical fantasy. Perhaps Bohmian mechanics, or non-local Bell correlations, or the quantization of spacetime, offers an attractive route to its fulfillment. But this, as I said, is the topic for another occasion.

As a general reminder to compatibilist and incompatibilist presentists alike, let me finish by stressing that the strictures of SR are quite strong; Lorentz symmetry is fantastically well confirmed in many disparate contexts and for many different phe-nomena.[68] As a consequence of this high degree of experimental and observational confirmation, it would be rational to expect Lorentz symmetry to be part of the true fundamental theory—although there is admittedly more to be said here about possible high-energy corrections of exact Lorentz symmetry. Rather than as a theory which has been supplanted by GR, relativistic quantum field theory, and—ultimately—a quantum theory of gravity, we should regard SR as a 'second-order constraint' on these more fundamental theories, as I have explicated in [Wüthrich 2010], §4. Quite generally, presentists often underestimate the dialectical work that needs to be done to get around SR's ruling that simultaneity is relative.

6. Taking stock: the grim prospects of presentism

In conclusion, we have found that fundamental physics does not uniquely determine the metaphysics of time, and hence does not entail the denial of presentism. But it does impose constraints which any naturalist worth her salt must respect. Metaphysics need not be subservient to physics, but to completely ignore pertinent

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[68] For an authoritative recent review of the main standard tests of Lorentz symmetry, cf. [Will 2005a], [Will 2005b]. [Salart et al. 2008] have tested for a privileged frame in the context of non-local Bell correlations and found no indication that there is any.

experimental findings and theoretical insights coming from the sciences testifies to philosophical *hybris par excellence*. It is worthwhile to recall that the naturalism that I have asked the reader to adopt is rather mild: it simply demands that no physically possible worlds are metaphysically impossible, where physical possibility gets judged by our best physical theories. Once we engage in a detailed analysis of just what it is that our best physical theories state as possible, we recognize that maintaining presentism, while defensible along many routes, bears a high cost. Most of this essay has been concerned with detailing that bill.

While the costs are high along all routes, the toll they extract may be quite different— presentists get to pick among many different poisons. But both sides of the balance sheet must be considered, costs as well as gains. To give a detailed analysis of the real or alleged gains in adopting presentism remains beyond the scope of this essay, but they surely include a claimed accordance with our intuitions, in particular in that it seems to make sense of the apparently so prevalent becoming and and ever-present transience in our world. It is this dynamical 'umph', this whoosh, that presentists often cite as their main explanatory accomplishment.

The lesson I wish to draw from my analysis is that the tension between modern physics and presentism can be resolved, but that all resolutions either require unpalatable metaphysics or speculative science, which our best current knowledge cannot support. On the first option, the presentist position may become so disfigured as to more than offset any advantage that may have been gained by its accordance with our intuitions. Finally, it should be noted that in order for this claimed advantage of presentism to come into play at all, the presentist must identify the *physical* structure which could justifiably play the ontologically special role and the mechanism which explains how our temporal intuitions arise from this physical structure. After all, the presentist draws an inference to the best explanation from our intuitions to the fundamentally privileged ontological status of the present. Hence, however this present is characterized, there better be an account of what it is and how it causally affects us in a way as to give rise to our temporal experi-

ences. And there seems to be no hope of delivering such an account if either the structure identified as the present or the causal mechanism are not physically tractable. To explicate this story is a tall order for both compatibilist and incompatibilist presentists.

I submit, therefore, that modern physics renders the prospects of presentism quite grim. As this essay has shown, however, presentism ought to be of interest not just for the metaphysician, but also for the philosopher of physics, as its analysis cuts deep into the foundational meat of many a physical theory[69].

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Presentism and Relativity: No Conflict

Jonathan Lowe

1. Introduction

In this paper, I shall discuss three problems that have puzzled philosophers of time for many years and explain why I think that they are not really problems at all, provided that one adopts an adequate ontology and understands properly the nature of change.[70] All of the problems turn at least in part on the question of whether *presentism* is a coherent conception of time, although it is only the third problem that is supposed by many to demonstrate the incoherence of presentism. It will emerge, however, that for the purposes of this discussion it matters very much what we take presentism to *be*. I shall be rejecting one currently popular version of this doctrine, which may be called 'presentism of the present moment' and which adopts an 'ersatzist' conception of past and future 'times'. My version of presentism deserves the name 'presentism' because it does insist on the ontological primacy of present reality and the objective status of temporal passage. But it repudiates the reification of time and 'times', including 'the present moment'. Instead, its focus is on the fundamental reality of *change*, which it conceives to be in all cases *existence* change – that is, the *coming into* or *going out of* existence of entities of one kind or another,

where these latter notions are taken literally and with serious onto-logical import.

My discussion of the first and second of these three problems is included in this paper partly in order to clarify the character of my particular version of presentism and to show that it can deal adequately with these two problems, prior to an examination of the third and more serious problem. I shall then endeavour to demonstrate that the third problem is not really a problem for presentism at all, once we understand presentism in my recommended way. The three problems in question are: (1) McTaggart's paradox, which led him to deny the reality of time, (2) David Lewis's problem of temporary intrinsics, which led him to endorse the doctrine of temporal parts and the 'perdurance' account of persistence, and (3) Minkowski's notorious claim that the Special Theory of Relativity implies the disappearance of time 'by itself', which has led many philosophers to reject both the reality of tense and the ontological primacy of the present.

2. McTaggart's paradox

McTaggart's argument against the reality of time has been interpreted in many ways in the hundred years or so since its first appearance, but for the purposes of this paper I think that it may fairly be represented as follows:[71]

1. Time implies change and *vice versa*.

2. B-series determinations ('earlier than', 'later than', etc.) are unchanging and so do not imply the reality of time or change.

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[71] For his final version of the argument, see [Mc Taggart 1927], Ch. 33. I discuss the argument more fully in [Lowe 1987], pp. 62–70 and in [Lowe 1994], pp. 307–319, but my analysis of it in the current paper contains some new features.

3. A-series determinations ('past', 'present', 'future', etc.) *do* involve change and therefore imply the reality of time.

4. All time determinations are either B-series determinations or A-series determinations.

5. Hence, only by admitting A-series determinations can time be regarded as real.

6. However, A-series determinations are contradictory and so cannot characterize reality.

7. Hence, time and change are unreal.

Comments

(a) The A-series and B-series are meant to be series of *events* – ways of ordering events in time. Indeed, they are supposed to consist of the *same* events, in the *same* order, but with this order determined in two different ways: on the one hand by certain *unchanging relations* between events (B-series determinations) and on the other hand by certain *changing properties* of events (A-series deter-minations). Thus, the Battle of Hastings is said to be unchangingly *earlier than* the Battle of Waterloo, but also *now* to be 'more past' than the Battle of Waterloo – although it *was* once 'less future' than the Battle of Waterloo, since both events have supposedly undergone a change from *being future* to *being past*, while retaining their *relative* positions in time.

(b) But *events* do not change – they *are* changes, if indeed they are anything at all: they are changes, for example, in the properties and relations of persisting *objects*. (Of course, not all metaphysicians will agree with me about this, but I follow a long and respected Aristotelian tradition in this

matter – one that I have defended at length elsewhere).[72]
To attribute to events changes in their supposed A-series
determinations is to confuse events with objects: it is to
treat events as entities that not only *have* properties but can
also undergo change in respect of those properties, just as
objects can. Moreover, the 'properties' in respect of which
events are said to change – alleged properties such as *past-
ness*, *presentness*, and *futurity* – are pretty clearly only
pseudo-properties, postulated at least partly on the basis of
the false analogy between events and objects. It is little
wonder, then, that thinking of time and events in this sort
of way leads to perplexity and paradox. But, in any case,
the foregoing considerations undermine premise (3) of
McTaggart's argument as I have laid it out above.

(c) Since events, if they are anything at all, just *are* changes,
the fact that the B-series determinations are themselves *un-*
changing is irrelevant. For, since the B-series is supposed
to be a series of events and *events*, if they are anything, are
just *changes*, the B-series, if it is real, does in fact imply
the reality of change and so of time. This undermines
premise (2) of McTaggart's argument as I have laid it out
above – although this does not mean that the notion of the
B-series, any more than that of the A-series, is free of diffi-
culty, as we are about to see.

(d) In point of fact, *both* of these notions are undermined by
the fact that we should not, in any case, *reify* events at all.
Objects may really 'undergo change', but we shouldn't as-
sume that in addition to these *changing* things there are fur-
ther *unchanging* things, the 'changes' that those changing
things undergo. To suppose this is to engage in an un-
justified and pointless double-counting, which philosophers
are probably drawn into by an illusion of language. For ex-
ample, when a living object such as an animal *dies*, it un-
dergoes change and ordinary language permits us to de-

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[72] See, for instance, [Lowe 1994], Ch. 13.

scribe this fact in two different but equivalent ways: we may either say that *the animal died* at a certain time, or that *its death oc-curred* at that time. But it is illegitimate to conclude that, in addition to the animal which died, a *further* thing existed at the time it died – the 'death' of that animal. Indeed, in a way ordinary language itself registers the illegitimacy of this conclusion, because it is contrary to accepted usage to say that deaths *exist*, only that they *occur*. And to say that *a death occurred* is just to say that *something* – an *object* of a suitable kind – *died*. This *object* is the only *existent* that we need acknowledge. (I shall say more about the illegitimacy of reifying events later in the paper.)

(e) McTaggart's claim (6) above, that A-series determinations are *contradictory*, is unwarranted. He makes this claim because he supposes that every event in the A-series would have to be *past*, *present* and *future*, despite the fact that these time-determinations are mutually incompatible. But he supposes this only because he supposes that the *passage* of time, which he takes to be necessary for the *reality* of time, would have to consist in events changing from *being future* to *being present* to *being past*. But, first, there *are* no such things as events, or at least no good reason to suppose that there are – as we have just seen in comment (d) above. Second, there are no such properties as pastness, presentness, and futurity, in respect of possessing which anything may *change*: these alleged properties are mere pseudoproperties, projected upon reality by philosophers who misunderstand the import of tensed language. And, third, the passage of time – as we shall see more fully in due course – in fact consists in the continual *coming into and going out of existence* of entities of various *bona fide* kinds (such as objects and properties), not in McTaggart's bizarre kind of pseudo-change.

Conclusion

McTaggart has an entirely mistaken view of what the reality of change and so of time requires. It does not require the reality of a *temporal series of events*, strung out like beads on a chain – a chain that is itself somehow slipping past a fixed point, the 'Now' or 'Present Moment', with the unchanging B-series determinations capturing only the unchanging relations between the beads (events), whereas the changing A-series determinations supposedly capture the changing relations between *the entire chain* and the 'Now'. *Of course* time couldn't be real if *this* is what it had to be like – but it doesn't. Indeed, we should no more reify time itself than we should reify events. *Change* and *temporal passage* are real enough, though, and consist in the continual coming into and going out of existence of entities. We shall see in the next section precisely what *kinds* of entities we need to include in our ontology for this purpose and see that we do *not* need to include 'events'.

3. Lewis's problem of temporary intrinsics

David Lewis famously advanced an argument, based on the so-called problem of temporary intrinsics, for the correctness of *perdurantism* as an account of persistence – perdurantism being the doctrine, advocated in opposition to *endurantism*, that objects persist through time in virtue of having different temporal parts at different times. (Endurantism, by contrast, is said to hold that objects persist through time in virtue of being 'wholly present' at different times, where this at least implies that they do *not* possess temporal parts.) Lewis's argument may be represented as follows:[73]

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[73] For the argument framed in his own words, see [Lewis 1986], pp. 202–204. I discuss it more fully in my [Lowe 1998], pp. 127–135, but, as in the case of McTaggart's paradox, the current paper contains some new points of criticism.

1. There may be an object, a, which is F at a time t_1 and G at another time t_2, where Fness and Gness are mutually incompatible intrinsic properties, such as being *bent* and being *straight*, or being *red* and being *green*.

2. This is possible only if one of three mutually exclusive options is correct:

    (i) a has a t_1 part which is F and a t_2 part which is G – in which case the doctrine of temporal parts (perdurantism) is true.

    (ii) a stands in the F-at relation to t_1 and in the G-at relation to t_2 – in which case endurantism may be true (a is 'wholly present' at both t_1 and t_2).

    (iii) Presentism is true, so that (1) is strictly speaking false, understood literally. Strictly speaking, all that can truly be said concerning an object such as a is either that a is *F simpliciter* or else that a is *G* (and so *not F*) *simpliciter* (where the 'is' in 'is *F*' and 'is *G*' is the 'is' of the *present tense*). To say that *a*, which *is G*, *was* not *G* but instead *was F*, is just to say, in effect, that *a* is *represented* as being *F* in some *mis*representation of present reality. This is 'ersatzism' concerning past and future 'times', analogous to 'ersatzism' concerning other 'possible worlds', and it is clear from what Lewis himself says that this is the only conception of presentism that he countenances. It is what I called, at the beginning of this paper, 'presentism of the present moment'. And it does not altogether surprise me that Lewis cursorily dismisses this view as incredible. Indeed, I agree with him on that point, although no doubt for somewhat different reasons.

3. So, option (iii) is incredible, while option (ii) makes all properties relational, which is both mysterious and coun-

terintuitive: hence, option (i) is correct and perdurantism is true.

Comments

(a) There *are* no 'times' – we should not *reify* either time or times. This is not the same as saying that 'time is unreal': for we can say that its reality consists simply in *the reality of change*, which is what constitutes so-called 'temporal passage'. Note also that, if we should not reify times in general, then *a fortiori* we should not reify 'the present moment'. And if we do not reify times then, even if we are presentists in my preferred sense, we do not need an 'ersatzist' or indeed any other kind of account of what times *are*.

(b) Option (ii) above does *not* make all properties relational in any objectionable or counterintuitive sense, even accepting that there *are* 'times' (*pace* comment (a) above). For an *intuitively* non-relational property is just one that doesn't involve its bearer (an *object*) standing in any relation to another *object* – and times, if indeed there are such entities, are certainly not *objects* (property-bearers capable of undergoing change in respect of their properties) but, rather, a species of *locations*. (I should stress that this observation lays to one side my objection, in comment (a) above, to the reification of times and that I am not personally committed to the reality of times even conceived merely as a species of locations.)

(c) Lewis fails, at least in his original presentation of the argument, to recognize another alternative to all three options that he acknowledges there, namely: (iv) *a* is-at-t_1 *F* and is-at-t_2 *G*. According to option (iv), often known as the 'adverbialist' solution to the problem of temporary intrinsics, we do not need to think of intuitively intrinsic properties such as bentness and straightness or redness and greenness as really being *relational* properties, consisting in relations

that their bearers have to times. Rather, we can and should relativize to times the *having* or *exemplifying* of these properties by their bearers. This is a solution that I once favoured myself, but now consider to have less merit than yet another option which I am about to describe.

(d) There is a perfectly viable alternative to Lewis's preferred option (i), which appeals to *trope* theory. (I was formerly unable to acknowledge this fifth option, because I used not to believe in tropes but conceived all properties to be *universals*). What we can say, according to this new option, (v), is that a is F at t_1 in virtue of the existence at t_1 of an Fness trope of a's and that a is G at t_2 in virtue of the existence at t_2 of a Gness trope of a's. These tropes need not be regarded as being *temporal parts* of a (nor even *parts of* temporal parts of a), unless perhaps one espouses a *trope-bundle* theory of objects – a theory which I personally reject. Hence, this option is perfectly compatible with *endurantism*. We can continue to say that a itself exists at both t_1 and t_2 despite having no temporal parts, thus being, in that sense, 'wholly present' at both of those times. Furthermore, denying a trope-bundle theory doesn't commit one to regarding a as a 'bare particular', as on the 'substratum' view, although this is a point that I do not have space enough to go into here. Observe that option (v) is just like Lewis's preferred option (i) insofar as it explains intrinsic qualitative change in a persisting object in terms of the existence of different things, at different times, suitably related to the object in question: but whereas for Lewis the things in question are *differently qualitied temporal parts* of the object, according to option (v) they are just *different qualities* of the object, conceived as particulars (tropes) rather than as universals. It seems clear that option (v) is more economical than Lewis's option (i), especially if one thinks that there are independent reasons for believing in tropes anyway. It is also more in line with common-sense thinking, inasmuch as it permits one to continue to believe in endurantism.

(e) Presentism, if developed sensibly, *doesn't* have to indulge in an 'ersatzist' account of past and future 'times', since times shouldn't be reified anyway (see comment (a) above). One implication of this is that even the *fifth* option, de-scribed in comment (d) above, really needs to be recon-ceived in a way which doesn't suggest any serious onto-logical commitment to times. In fact, we can regard the best solution to Lewis's supposed problem as involving a combination of this fifth option, suitably purged of any on-tological commitment to times, with a kind of presentism which is quite distinct from what I have been calling 'pre-sentism of the present moment'.

Conclusion

If the question is supposed to be: 'How can an object persist through a change in its intrinsic properties?', one perfectly viable answer is given by the option described in comment (d) above: it can do so because its intrinsic properties are *monadic tropes* which successively *come into* and *go out* of existence while it (the object) *stays* in existence. On this account, no two incompatible tropes of the same object ever *coexist,* so there is no problem. More gener-ally, however, we can see from the preceding discussion that the supposed problem of temporary intrinsics in fact imposes virtually *no constraint whatever* on the metaphysics of time, persistence, and change, since perdurantism, endurantism, eternalism and pre-sentism are all capable of dealing with it perfectly satisfactorily on their own terms. It does not help us to choose between any of these theories, which have to be judged by other criteria entirely. In fact, it should probably now be relegated once and for all to the dustbin of metaphysics, along with McTaggart's alleged paradox.

4. Minkowski's proclamation of the disappearance of time

Minkowski famously said that 'Henceforth space by itself, and time by itself, are doomed to fade away into mere shadows, and

only a kind of union of the two will preserve an independent reality'. [74] Subsequently, many philosophers have attacked certain metaphysical views of time by appeal to Minkowski's vision of physical reality, assuming that 'science is on their side'. Their claim, more specifically, is that the Special Theory of Relativity (STR) poses a devastating problem for any theory, such as presentism, which accords a special ontological status to *presently existing* entities. Instead, we are supposed to embrace the 'Block Universe', in which all objects and events co-exist, with an equal ontological status, at various different 'spacetime locations'. The problem is supposed to derive from the thesis of the *relativity of simultaneity* that is notoriously a feature of STR. Here is a reconstruction of the sort of argument that such critics of presentism typically have in mind. [75]

1. STR shows that simultaneity is always *relative to inertial frames*, never *absolute*, and that events which are simultaneous relative to one frame, F_1, need not be simultaneous relative to another frame, F_2.

2. According to presentism, though, an event which is *now past* no longer *exists*, since only *presently* existing things exist at all.

3. However, suppose that e_1 is a presently existing event which is simultaneous, in some frame F_1, with another event e_2, which consequently *co-exists* with e_1, according to the presentist. Then it cannot in general be ruled out that there are two other frames, F_2 and F_3, such that e_2 is simultaneous, in F_2, with a third event e_3 and yet e_1 is *not* simultaneous with but *later than* e_3 in F_3. Hence, it seems, the presentist must say that e_1 co-exists with e_2, that e_2 co-exists with e_3, and yet that e_1 does not co-exist with e_3 – and thus that co-existence is *not transitive*. But this is absurd.

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[74] See [Minkowski 1952], p. 75.
[75] For an early version of this sort of argument, see [Putnam 1967].

4. Furthermore, the presentist cannot defend himself by urging that, even if e_1 and e_3 are not simultaneous in F_3, there may still be yet another frame, F_4, in which they *are* simultaneous. For STR implies that this need not be so. STR implies that e_1 and e_3 may be non-simultaneous in *all* frames (and thus be 'time-like separated'), even though e_1 is simultaneous with e_2 in F_1 and e_2 is simultaneous with e_3 in F_2 (so that e_1 and e_2 are only 'space-like separated', as are e_2 and e_3). All we have to suppose is that e_2 lies *outside e_1's* forward and backward light-cones, that e_2 likewise lies *outside e_3's* forward and backward light-cones, but that e_3 lies *inside e_1's* backward light-cone – and the geometry of Minkowski spacetime clearly allows for this possibility.

5. However, if co-existence *is* transitive, then the presentist himself must concede that e_1 is after all co-existent with e_3, despite the fact that, in F_3, and indeed in *all frames*, e_3 is *earlier than e_1*, which is supposedly a *presently* existing event. Hence, the presentist must give up his key claim that the only things that exist at all are presently existing things. For, he must recognize e_3 as being an event which *exists*, since it *co*-exists with the existing present event e_1, even though e_3 is *not* a present event.

Comments

(a) We can't just assume that the parameter 't' used in the mathematical formalism of STR really does designate *time* or *times*, since it is operationally defined in terms of *clock readings* and only a further metaphysical assumption allows us to regard these as being coordinated with 'times'. STR as a formal theoreti-cal structure is in fact interpretable, consistently with the empirical data usually taken to confirm it, in ways that are compatible with various different metaphysical systems as far as time is concerned – even with systems incorporating absolute time and absolute si-

multaneity.[76] The empirically confirmable fact at the heart of STR is that the amount of time, as measured by clock readings, taken for a light signal to complete a round trip from an observer *A* to an ob-server *B* and back again to *A* is constant in all inertial frames. But the amount of time taken for each *one-way* journey in such a round trip is not empirically determinable. STR as it is standardly interpreted is founded on the assumption – or, as it is sometimes put, the 'convention' – that the one-way journey-time is equal in both directions. There is no reason, in principle, why this assumption shouldn't be challenged if certain consequences of STR, thus interpreted, turn out to be metaphysically objectionable. (This is not to suggest that we could have reasons to suppose that what is genuinely physically possible could turn out to metaphysically *im*possible, since I take it that it is a logically necessary condition of something's being physically possible that it is metaphysically possible. The lesson, rather, is that it is a mistake to suppose that a logically suf-ficient condition of something's being physically possible is that it is implied by a logically consistent physical theory all of whose empirically confirmable implications are indeed empirically confirmed: for the theory may include various empirically un-confirmable assumptions which are merely *logically* possible but which turn out to be metaphysically impossible).[77]

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[76] See [Tooley 1997], Ch. 11. Giuliano Torrengo has rightly pointed out to me that (in his words) 'compatibility with absolute simultaneity is gained at the price of positing facts of the matter about what is the privileged frame of reference that are, in principle, empirically undetectable'. However, as I am about to observe in the main text, the standard view that STR implies the relativity of simultaneity also rests upon an empirically undetectable posit, namely, that in a round trip from *A* to *B* and back to *A*, the one-way journey-time for a light signal is the same in both directions.

[77] I say much more about physical, metaphysical and logical possibility and their relationships to one another in [Lowe 1998], Ch. 1. I am grateful to Giuliano Torrengo for raising the query that I have just answered in the main text.

(b) Even accepting that STR shows that simultaneity is relative to inertial frames and is never 'absolute', what *are* such 'frames', empirically speaking, other than simply systems of *existing physical objects*, such as the Earth? Now, if STR compels a presentist to treat existence and co-existence as *frame*-relative, then that is just to say that the presentist must concede that what co-exists with *one* thing, *x*, need not always co-exist with *another* thing, *y*, even if *y* itself co-exists with *x*. The fact is, however, that presentism – at least as I am understanding that view here – is *already* committed to the non-transitivity of co-existence, so that STR is not forcing upon the presentist anything that the presentist shouldn't be ready, and happy, to endorse in any case.

(c) To make this clear, consider the account of the *passage of time* advanced earlier, which is clearly a 'presentist' one. The presentist (my kind of presentist, at least) says that when 'time passes' *the content of reality itself* changes – entities *come into* and go *out* of existence. (And they do so *literally* and *absolutely*, so that going out of existence is *absolute annihilation*, not merely a fact about an existent entity's spatiotemporal location relative to that of some other existent entity, as 'eternalists' would have it.) Hence, on this view, things which only *came into* existence today do not in any sense whatever *co*-exist with things which *ceased* to exist yesterday. But, even so, *some* things that do exist today *already existed* yesterday. Thus, for example, *I* exist now but also existed yesterday. And I *don't* mean by this just that some earlier *temporal part* of me existed yesterday and that *another* such part of me exists today, since I am endorsing endurantism. I mean that *the very same person*, EJL, who exists and is 'wholly present' now *also* existed and was 'wholly present' yesterday. However, a certain trope of mine, T_1, which co-existed with me yesterday, does *not* co-exist with another trope of mine, T_2, which co-exists with me now, since – we may suppose – T_1 went out of existence yesterday and T_2 came into exis-tence today.

So T_1 and EJL are co-existent entities, as are EJL and T_2, but T_1 and T_2 are *not* co-existent entities. Hence, co-existence is *not transitive*. This is not a *problem* for presentism, but part of what makes it the distinctive position that it is (at least as I am proposing to interpret that position).[78]

(d) The argument from STR against presentism just assumes, without warrant, that a presentist must accept the transitivity of co-existence. But the ontological thesis at the core of presentism, at least as I understand that position, is that the content of reality – *the sum total of existent entities – changes* as 'time passes' and, indeed, that it is precisely in this kind of change that the so-called passage of time consists. But the implication of this is *not* that when *one* entity goes out of existence, so do *all other* entities: a *complete* existence change of that sort would amount to nothing less than the end of the world! (This is one reason why I find 'presentism of the present moment' so incredible, since it seems to confine all existing things not just to presently existing things but to presently existing *momentary* things, which therefore can only begin or cease to exist *together*, if indeed they can really be said to 'begin' or 'cease' to exist at all.) There is generally 'overlap' between the content of reality at one 'time' and the content of reality at another 'time', especially if those 'times' are 'close together'. (Once again, though, we should not read this claim as in-

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[78] Giuliano Torrengo has put it to me that (in his words) 'accepting that transitivity of co-existence can fail for non-instantaneous entities is compatible with maintaining that it cannot fail for instantaneous entities'. That is certainly correct, but it doesn't bear directly upon my own version of presentism, since my version of presentism is not committed to the reality of instantaneous entities of any kind, such as momentary events. Indeed, as will be seen later, I positively *reject* the reality of momentary events. Hence, the only sort of principle of the transitivity of co-existence with which I need to contend is one that applies exclusively to *non-*instantaneous entities — the only kinds of temporal entities whose reality I am prepared to recognize. And, as I have just shown in the main text, I have good reason to reject any such principle.

volving a serious ontological commitment to *times*, over and above objects and their properties: it is just to be understood as a convenient *fa,con de parler*, whose literal meaningful content can only be cashed out in terms of talk about changes in and to objects and their properties.) That being so, presentism as I understand it is inevitably committed to a kind of *relativity of co-existence* which does not sustain the thesis that co-existence is transitive. In fact, the thesis that co-existence is transitive finds its natural home only in an *eternalist* conception of time and reality, such as that of the four-dimensional 'Block Universe'. Hence, the argument from STR against presentism, to the extent that it appeals to this thesis, is in fact subtly question-begging. (And without the thesis, the argument simply will not work.) It smuggles into its case against presentism a *metaphysical* thesis which has no foundation in STR itself, regarded as an empirically well-confirmed scientific theory – a metaphysical thesis which is reflective of precisely the eternalist conception of temporal reality that presentism rejects. Thus, in the guise of an appeal to *science*, the philosophers who deploy this argument are in fact merely evincing their hostility to the *metaphysics* of presentism and their allegiance to that of eternalism. Metaphysicians should fight their battles under their own banners and on the battle-field of metaphysics, not by deviously presenting their arguments as having the *imprimatur* of empirical science.

Conclusion

Metaphysicians should not stand in awe of an empirical scientific theory like STR, allowing it to dictate to them what ontology of time and change they should be prepared to endorse. Before we can decide whether a scientific theory of *X* is a *good* scientific theory, judging by the empirical evidence available, we need to be satisfied that it is indeed a theory of *X* – and this will require a prior account of *what X is*. Providing an account of what time and

change *are* is a task for metaphysics which must be *sensitive*, but not *subservient*, to the findings and opinions of empirical scientists on these matters. More particularly, the charge that STR shows that presentism is incompatible with the empirical data that is usually taken to confirm STR is not only mistaken, but actually draws upon undefended metaphysical presuppositions, such as that co-existence must be transitive.

5. Final remarks on events, change, and the passage of time

I said earlier that we should not *reify* events. The language of events, as I see it, is just a convenient way of talking about *changes in things*. On the view of change that I favour, *all* change is *existence* change – that is, a matter of the *coming into existence* or the *going out of existence* of something. (And note once more that these notions of coming into and going out of existence are here taken *seriously and literally*: going out of existence, for instance, is taken to be *absolute annihiliation*. By contrast, on an 'eternalist' view of time, nothing ever really ceases to exist in this sense, since to say that something has 'ceased to exist', on this view, is merely to say that it doesn't exist *at the time of speaking*, only at *earlier* times than that – not that it doesn't exist *at all*.) Two kinds of entity, in particular, are subject to such change: *objects* and their *properties* (to which we may add their *relations*, if we believe in relations). But it is important, for this purpose, to think of the properties of objects as *particulars* – 'tropes' or 'modes' – rather than as *universals*, since universals, if they exist at all, plausibly do not come into or go out of existence. On the view now being recommended, when a leaf, say, undergoes a qualitative change in its colour, from *green* to *brown* (when, for instance, it is burnt in a flame), this is not – or not merely – a matter of the leaf's first exemplifying the universal *greenness* and then later the universal *brownness*. If *that* were all that such qualitative change amounted to, then change of this kind would *not* be a species of *existence* change: for neither the leaf, nor either of the universals greenness and brownness, undergoes existence change in this case. However, what we *should* say, I believe, is this: in this case there is indeed

existence change, because the qualitative change in the leaf actu-
ally consists in a *green trope* of the leaf's going *out* of existence
and a *brown trope* of the leaf's coming *into* existence in place of it.
Now, if we do say this, then there is no need whatever to say that
any *event* additionally exists in such a case, such as the 'event' of
the leaf's changing from green to brown. The only entities to
whose existence we need appeal are *the leaf and its tropes*: the leaf
remains in existence, while one of its tropes goes *out* of existence
and another comes *into* existence. *And that's all*.

It would be absurd to insist here that, in addition to each of
these tropes, there are two *events*: the event of *the green trope go-
ing out of existence* and the event of *the brown trope coming into
existence*. If we say that there are such events and that they exist,
respectively, at the moment when the green trope goes out of exis-
tence and at the moment when the brown trope comes into exis-
tence – for when else, indeed, could they exist? – then we are faced
with the following seemingly insuperable difficulty. These sup-
posed events are just *momentary* entities, which therefore come
into existence for a moment, only to go out of existence immedi-
ately. But if we need to invoke the existence of an event when a
trope comes into or goes out of existence – the supposed event of
that trope's *coming into or going out of existence* – then, by the
same token, we would need to invoke the existence of another,
second-order event when such a supposed event *itself* comes into
or goes out of existence. Thus, if the coming into existence at time
t of trope *T* requires the existence at *t* of the momentary event *e* of
T's coming into existence at t, then, by parallel reasoning, event *e*'s
coming into existence at *t* would require the existence at *t* of the
momentary event of *e's coming into existence at t* – and we are
drawn into an absurd infinite regress and therewith a massive and
purposeless proliferation of events of ever-ascending orders.[79]

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[79] This is not meant to be an argument against the existence of momentary
or instantaneous entities quite generally, only an argument against the
need for momentary events in any ontology which allows that entities of
certain kinds come into and go out of existence 'at a moment', i.e. instan-
taneously. It shows, thus, that an ontology which includes persisting but
impermanent *non*-instantaneous entities need *not* also include instantane-

The lesson is that an ontology of objects and tropes enables us to *dispense entirely* with 'events', which we may regard as superfluous shadows cast by language rather than as fundamental ingredients of temporal reality.[80] Temporal reality, on the view now being recommended, involves nothing more nor less than the ceaseless coming into and going out of existence of entities of either of two basic kinds: *enduring objects*, on the one hand, and their *tropes or modes* on the other. And it is precisely in this ceaseless *existence change* that the passage of time consists, according to the version of presentism that I am now recommending.[81]

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ous entities simply on account of the impermanence of the former entities. However, I do in fact consider that instantaneous entities of *any* kind should be regarded as entia non grata and that no one has ever provided compelling reasons, either scientific or metaphysical, for belief in them. Modern quantum physics certainly does not countenance such entities and they seem only to have been favoured by certain metaphysicians, notably by ones who would describe themselves as 'four-dimensionalists'.

[80] For a full account of my own version of such an ontology, see [Lowe 2006b].

[81] For more about this view of time and change, see [Lowe 2006a].

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Presentism and Grounding Past Truths

Matthew Davidson

1. Introduction

In this paper I will consider a number of responses to the grounding problem for presentism. I don't think that the grounding problem is a damning problem for the presentist (it seems to me that presentism has much more serious problems with cross-time relations[82] and relativity). But each of the solutions comes at a cost, and some are much pricier than others. I will set out what I take these costs to be when I examine each response to the grounding problem.[83]

Presentism is the thesis that whatever exists is present. Equivalently, presentism is the thesis there are no merely past or future objects. The grounding problem for presentism arises when we try to square presentism with the idea that what is true must have a grounds for its truth. Typically this intuition about grounding is explicated by means of one of the two following principles.[84]

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[82] See [Davidson 2003], [Crisp 2005], [De Clercq 2006], and [Ciuni and Torrengo 2012] for further discussion of the problem of cross-time relations.

[83] This essay is intended to provide a survey of the debates surrounding presentism and truthmaking. The reader should also consider Simon Keller's fine essay on this same topic ([Keller 2004]), as well as Brian Kierland's paper in this book.

[84] Here my terminology follows Merricks' helpful discussion in [Merricks 2007].

Truthmaker: Necessarily, for any true proposition, there is something that makes it true. (See, e.g. [Armstrong 1997], [Armstrong 2004]; and [Russell 1918].)

TSB (Truth supervenes on being.) Truth supervenes on what things there are and the properties and relations they instantiate. (See [Bigelow 1988], p. 133; [Lewis 1999], pp. 206–207, [Lewis 2001]).

Truthmaker has well-known troubles accounting for the truth of negative existentials. As a result, many plump for the weaker TSB instead.[85] TSB looks very plausible. I will assume it to be true throughout the course of this paper. If one rejected it (and Truthmaker), though, the grounding problem for presentism wouldn't arise.[86]

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[85] Merricks argues ([Merricks 2007], Ch. 4) that TSB requires that each true proposition be made true by what it is "about", and as a result TSB doesn't, after all, help in accounting for the truth of negative existentials. I have some sympathy with Merricks' claim that grounding requires something stronger than TSB. This will surface at various points in the essay. But assessing Merricks' arguments that TSB, properly understood, is very much like Truthmaker is beyond the scope of this paper.

[86] TSB is quite weak. One could imagine someone demanding a grounds for past and future truths but allowing other violations of TSB, but it's diffcult to see how to motivate such a view. Indeed, [Merricks 2007] rejects TSB because he thinks it is inconsistent with presentism and presentism is true. [Sanson and Caplan 2010] suggest that the presentist should drop TSB and employ an irreducibly-tensed language to explain the present truth of past tensed (true) statements — a similar position is advanced by [Tallant 2009a] and [Tallant 2009b]. [Torrengo forthcoming] criticizes their arguments.

2. The grounding problem

Suppose TSB and presentism are true. Suppose, also, that Socrates doesn't exist anymore (he's not still around in virtue of being an immortal soul, say). Now, it seems as though

(1) Socrates was snubnosed

is true. It also seems that

(2) Obama was a child

is true. But on what do the truth of (1) and (2) supervene? Socrates no longer exists, and Obama no longer has the property *being a child*. The (typical) eternalist has ready grounds for the truth of (1) and (2). Even if Socrates doesn't exist now, Socrates exists. If a temporal part of Socrates was snubnosed, then (1) comes out true. Past childish temporal parts of Obama exist, and they make true (2). But the presentist can't make use of past objects (or past temporal parts of present objects) to explain how propositions like (1)

A related problem

Consider (1). Suppose we have an appropriate ground for its truth. There is another problem lurking in the neighborhood, though. Suppose one is a presentist and a direct reference theorist. Then Socrates isn't around to be a constituent of the proposition *Socrates was snubnosed*. So the proposition can't be true because it's not "complete."[87] It seems to me that the presentist ought to reject direct reference and allow individual essences (haecceities or world-indexed essences) to be constituents of propositions. I will assume in this paper that the presentist has some sort of fix for this problem of incomplete or gappy singular propositions. Then the question

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[87] See [Plantinga 1983], [Adams 1986], [Davidson 2000], [Davidson 2003], [Davidson 2007], and [Crisp 2007] for more on these sorts of worries.

will be: Assuming this, does the presentist have an appropriate supervenience base for complete propositions like (1) and (2)?

Three quick solutions

There are three very straightforward responses to the grounding problem. It's important to mention them, though I won't discuss them at length here. First, one might think that it is clear that TSB and presentism are in conflict, and give up presentism. Lewis ([Lewis 1999], p. 207) suggests just this. Second, one might think that it is clear that TSB and presentism are inconsistent, and choose to give up TSB. Trenton Merricks ([Merricks 2007]) does this. Merricks thinks that TSB, properly understood, is very similar to Truthmaker. TSB requires that the subvening base for the truth in question be what the truth is "about." None of the supervenience bases he surveys are such that non-present (past and future-tensed) truths are "about" them. So there is no supervenience base for non-present truths. But presentism is true; so much the worse for TSB.

I have some real sympathy for Merricks' arguments to the conclusion that (in essence) mere TSB as it's typically stated (and as I state it here) is too weak to fully capture our intuitions about grounding. However, I tend to think that a stronger grounding relationship tells in favor of eternalism.

Third, one might keep presentism, TSB, and claim there are no contingent truths about the past or future. Some philosophers–most famously Aristotle–have said that there are no future contingent truths. Usually this position is adopted as a way of escaping fatalism (divine or otherwise). Even so, this is not a position one adopts lightly. But the weight of this position pales in comparison to that of the view that there are no past truths. There are various paraphrase strategies one might adopt to try to ease some of the sting of this sort of view (see [Davidson 2003] for discussion of these). In the end, though, denying there are past truths is a view of prohibitive cost for most philosophers.

We now turn to five (other) solutions to the grounding problem.

3. Lucretianism

One way of reconciling TSB and presentism is to claim that there presently exists past-directed properties, and entities' instantiating these make true propositions about the past. So, again consider

(2) Obama was small.

(2) may be thought to be true in virtue of the fact that Obama has the property *having been small*. Obama's having this property entails that (2) is true, and we have our supervenience base. But what about

(1) Socrates was snubnosed?

Socrates isn't around anymore to provide a ground for the truth of (1), the way Obama can provide a ground for the truth of (2).[88] Taking his cue from Lucretius, John Bigelow ([Bigelow 1996]) argues that presentists might think that the grounds for the truth of propositions like (2) is the world's having the property *being such that Socrates was snubnosed*. Indeed, one can use any object that never passes out of existence or comes into existence and take its having the requisite past-directed (or future-directed) properties to be the grounds for the truth of propositions like (2).[89]

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[88] I assume here the truth of serious presentism, the view that objects have properties at times only when they exist at that time. I think it follows from presentism; see [Davidson 2003] for an argument to this effect. See also [Bergmann 1999].

[89] For instance, one might follow [Chisholm 1990] and allow abstracta to bear these sorts of past and future-directed properties. It's worth pointing out that if you have a suffciently abundant view of properties, each abstract object will have these sorts of properties, and the world will have it, too. (Indeed, I have the property being such that Socrates was snubnosed.) Even on a solution like that of [Crisp 2007] or [Kierland and Monton 2007] on which the truth of past (or future) propositions is grounded by

There are a number of objections one might make to Lucretian-ism. Perhaps the most frequent objection one encounters to this sort of proposal is that positing these sorts of past-directed (or future-directed) properties is, in the words of Theodore Sider, *cheating* ([Sider 2001] pp. 36–41).[90] A property like *being such that Socrates was snubnosed* is "hypothetical" and – for the presentist – not reducible to categorical properties. It is hypothetical in the sense that it "points beyond itself, to the past" ([Sider 2001], p. 41). Now, it's not at all clear what the hypothetical-categorical distinction comes to, and Sider himself admits that the distinction is "elusive".[91] But it clearly is true in some important sense that *being such that Socrates was snubnosed* points beyond the present moment in a way that, say, *being square* doesn't. It's also clear why, for the presentist, this past-directed property isn't reducible to purely categorical properties in the way it might be for an eternalist. But the presentist may object that it isn't at all clear why relying on these sorts of irreducibly hypothetical properties is such a bad thing.[92] For instance, many philosophers think that modal properties can't be reduced to categorical properties, so many philosophers already are committed to irreducibly hypothetical properties.[93] Most metaphysicans think that in general hypothetical properties should be reduced to categorical properties where they

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another sort of entity (ersatz times or a sui generis past), the properties of the Lucretian still will be exemplified (so long as one has a sufficiently abundant view of properties). The truth of past (and future) propositions will supervene on the exemplification of these properties. The difference between the Lucretian view and a view like Crisp's or that of Kierland and Monton's lies in there being another sort of entity on which the truth of past or future propositions also supervenes.

[90] See [Tallant 2009b] for further discussion of cheating.

[91] See [Crisp 2007] for further discussion of the distinction and the problems it (allegedly) raises for the presentist.

[92] See [Crisp 2007] for argument to this effect.

[93] David Lewis, of course, thinks he can reduce modal properties to categorical properties. See [Roy fothcoming] for insightful discussion of reducing modality.

can be so-reduced. So being left with unreduced past or future-directed properties would appear to be a cost of Lucretianism.

A second related objection to Lucretianism is that it is extravagant ontologically. It's not just that one is committed to the existence of irreducibly hypothetical properties. It's that one is committed to so many of them. For instance,

(3) Caesar crossed the Rubicon

also is true. So the Lucretian is committed to the existence of *being such that Caesar crossed the Rubicon*. And so on.

It's not clear to me that this is a serious objection to Lucretianism. First, many already are committed to there being a property for every predicate (for instance, one might think this if properties are taken to be the semantic values of predicates). So there is independent reason to think that these properties exist.

Second, the Lucretian might think of a property like *being such that Socrates was snubnosed* as a complex entity composed of a categorical base – *being Socrates* and *being snubnosed* – together with a hypothetical element – *being past*. So the Lucretian might "separate out" the hypothetical element from the past and future-directed properties she uses for grounding truths and be left (*qua* Lucretian) with only two irreducibly hypothetical properties, *being past* and *being future*. There still looks to be a cost here for the Lucretian in that there are irreducibly hypothetical properties. But the cost might be lower than one might have thought at first, as there are only two of them.

A third objection to Lucretianism we might call the *shifting-truthmakers objection*.[94] Suppose there's a cup named "Frank." At t_1 Frank is red. So

(4) Frank is red

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[94] I make the same sort of argument in [Davidson 2004], p. 21.

is true at t_1. Intuitively, (4) is made true by Frank's exemplifying the property *being red*. Suppose at t_2 that Frank is painted blue. Then

(5) Frank was red

is true at t_2. For the Lucretian, (5) will be made true by Frank's exemplifying the property *having been red*. The grounds for the truth of (5) is, like the grounds for (4), Frank's having a property. Suppose at t_3 Frank is annihilated. (5) is still true, but suddenly its truthmaker switches to the world's having the property (or an abstract object's having the property) *being such that Frank was red*. This sudden shift in truthmakers is troubling, and it's not one the typical eternalist has to worry about. (I will argue it is one that several other presentist solutions to the grounding problem have to contend with, as well.) The Lucretian might propose that (5) at t_2 is made true by the world's having the property *being such that Frank was red*. But of course this doesn't allow the Lucretian to avoid the shift in truthmakers from t_1 to t_2.

It should be said that it's not *merely* that the truthmakers for (4) to (5) (at t_1 or at t_2) shift. There also is a problem in what the truthmaker shifts *to*. On the face of it, Frank's exemplifying a property is an appropriate truthmaker for both (4) and (5). Both seem to be *about* Frank and a property. But (5) simply doesn't seem to be *about* the world's having a property. To see this, suppose you think of propositions as structured sorts of entities. So, for the presentist, (5) is composed of an individual essence of Frank[95] and the property *having been red*. How, then, is a proposition composed of these elements grounded by the world's having a property? (This suggests, I think, that something stronger than TSB is needed to capture our intuitions about grounding.)

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[95] Or Frank, though as I pointed out earlier, things are cleaner if one takes essences to be constituents of singular propositions.

So there are costs to Lucretianism. One is committed to at least two irreducibly-hypothetical properties. One also is committed to a shift in truthmakers as time passes, and a shift to the wrong sort of truthmakers as time passes. The eternalist (who is a four-dimensionalist or stage-theorist) is committed to none of these things.

4. Theistic

Presentism Alan Rhoda ([Rhoda 2009]) advances a theory of grounding for past truths that would have made the Medievals proud: God's memories ground truths that are wholly about the past. So (1) is made true by God's memory that Socrates is snub-nosed. Rhoda's view is a sort of "divine Lucretianism", it would seem. Rhoda thinks that theistic presentism has the virtue that it doesn't involve any "cheats" in the way the Lucretianism does.

Furthermore, theistic presentism it is not vulnerable to the charge of metaphysical 'cheating' as is Lucretianism . . . the Lucretian's past-tensed properties are suspicious because they make no specifiable real difference to anything else. Apart from using formulaic labels like being such that Caesar was assassinated in 44 BC on the Ides of March, the Lucretian has no informative story to tell about what constitutes the having of such properties, or of what it is about the universe, regions of space, atomic particles, or what have you that enables them to bear such properties. By contrast, the theistic presentist does have a story to tell: Past-tensed properties are representational mental states of God, specifically, his memories. Analogy with human memory and other recording devices makes it reasonably clear how those representational states could bear the requisite structure to reflect the past. Furthermore, if theistic presentism is correct, then God's memories can make a real difference by informing his ongoing providential dealings with creation. For example, God could, if he desired, communicate to us information about the distant past (see [Rhoda 2009], p. 55).

It's not clear to me how Rhoda avoids problems with cheating.[96] The problem with cheating, as Sider sets it out, isn't that there is no story to tell with respect to the world's having properties like *being such that Socrates was snubnosed*. Rather, the problem is that these properties are irreducibly past-directed. In this regard, God's present thoughts fare no better; they too are irreducibly past-directed. So it seems to me that if Bigelow has a problem with cheating, so does Rhoda.

Rhoda's view also runs aground of the shifting-truthmakers objection. (4) is made true by Frank's having the property *being red*. (5) at t_2 is made true by God's remembering that (4) was true. So there is a shift in truthmakers from Frank's having a property to God's mental states. Also, there is a shift to what seems to be an inappropriate truthmaker, just as was the case with Lucretianism earlier: (5) looks to be made true by Frank's having a property, not by God's memories.

There also is also a sense in which the Rhoda gets the explanatory priority of elements in his account wrong. God's remembering *Socrates was snubnosed* does provide a supervenience base for the truth of *Socrates was snubnosed*. But in some important sense *Socrates was snubnosed*'s being true is *prior* to God's remembering *Socrates was snubnosed*. However, TSB is satisfied here; yet again we have a suggestion that TSB isn't strong enough to capture the grounding intuition that led us to TSB in the first place.

Apart from these considerations, Rhoda's theory will be prohibitively expensive for many philosophers as it relies on God to ground the truth of past-tense proposi-tions.

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[96] While preparing this paper for press I came across Caplan and Sanson's (excellent) [Caplan and Sanson 2011], in which they make the same argument in response to Rhoda.

5. Ersatz B-Series

This strategy for grounding past truths has been developed by in great detail by Thomas Crisp ([Crisp 2007]).[97] The idea is to construct a series of abstract times that mirror those of the eternalist. But all of the times exist at each moment in time, so they are always around to do truthmaking duties. Crisp defines a time as follows:

x is a time := For some propositions, the ps, such that the ps are *maximal* and *consistent*, x= [(y) (y is one of the ps $\subset$ y is true)]

where (i) a class C of propositions is maximal iff, for every proposition p, either p or its denial is a member of C, (ii) a class C of propositions is consistent iff, possibly, every member of C is true, and (iii) '[$\forall y(y \in C \subset y$ is true], I assume, denotes a tense-less proposition (lest my attempt to give a reductive account of tensed properties fall into unhappy circularity).

The present time is the time that is true. Past times are times that were true. (2) is true in virtue of the fact that there is a past time in which it is true. For a proposition p to be true at a time t simply is for t to be such that were it true, p would be true.

Alternately, we might take a time to be a maximal non-temporally-indexed state of affairs. On this view, the present time is the time that obtains now. These would be akin to Plantinga's ([Plantinga 1985]) possible worlds, apart from the fact that Plantinga takes possible worlds to be maximal temporally-indexed states of affairs.

Certain times are past and others are future. So it might look as though the ersatz B-series theorist is left with the same sorts of primitives that the Lucretian (in the best case scenario) is left with.

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[97] [Davidson 2003] and [Davidson 2004] suggests such a strategy, and [Bourne 2006] develops it. See also [Markosian 2004]. Because of limitations on space, I will focus on Crisp's account.

But Crisp analyzes away properties like *being past* and *being future* into an orthodox B-theoretic relation: *being earlier than*. Crisp says

> We can now see how the presentist can do without primitive pastness, presentness and futurity. She need simply take the foregoing earlier than relation as primitive, and say that a time is past iff*df.* it is earlier than the present time, that a time is future iff*df.* it is later than the present time, and that the present time is*df.* whatever time happens to be true. ([Crisp 2007], pp. 104–105)

So the *earlier than* relation between times is Crisp's unreduced primitive.

How does Crisp's solution fare compared to the Lucretian solution? The Lucretian solution at its best has two primitives that Sider would complain "cheat": *being past* and *being future*. Crisp's solution involves only one, the *earlier than* relation. Furthermore, the *earlier than* relation is an orthodox B-theoretic relation, and it's one that even the eternalist claims her concrete times stand in to one another. What makes it the case that one concrete time stands in the *earlier than* relation to another? Even for the eternalist, that (or some-such relation) seems to be primitive. So Crisp seems to have left the presentist with a primitive (the likes of which) even the eternalist is left with. If Crisp's primitive is a cheat, so too, it would seem, is the eternalist's.

One might balk at the whole menagerie of abstract times that Crisp uses to ground past (and future) propositions. But for those (many) philosophers who already believe in "ersatz" Plantinga or Adams-style ([Adams 1974]) possible worlds, Crisp's ontology might not seem that extravagant.

It's worth noting that Crisp's solution also runs into trouble with the shiftingtruthmakers objection. Consider again

(4) Frank is red.

(4) is true at t_1. The truthmaker here, intuitively, is Frank's having the property *being red*. Now, as before, Frank is painted blue at t_2. At t_2

(5) Frank was red

is true. What makes it true? It's (ultimately) that there is a past time in which (4) is true. But here we've changed from a truthmaker involving a substance and a property to one involving abstract times. And, as with the Lucretian, one might object not just to the shift in truthmakers, but to what the truthmakers shift *to*. The proper ground for (5) (at t_1 and at t_3 where Frank is annihilated) would seem to involve Frank and a property. That's what (5) seems to be *about*. This is the sort of thing that only the eternalist may avail herself of; the presentist (at t_3) doesn't have Frank around as a truthmaker. Crisp could ground (5) at t_2 in Frank's having a past-directed property, but that would defeat a main virtue of his theory: he has only one primitive hypothetical property (the *earlier than* relation), and it's not at all an implausible one. But even if he did ground (5) at t_2 in Frank's having a property, (5) at t_3 must be grounded in a time. The proper ground of the truth of (5) doesn't seem to be a time. It ought to have something to do with Frank's having a property. So once again, we have a metaphysic that allows presentism to be consistent with TSB and the truth of propositions like (1) and (2), but once again there seems to be more to grounding truths than satisfying TSB.

6. Brute Past Presentism

Brian Kierland and Bradley Monton ([Kierland and Monton 2007]) argue that the past can serve as a truthmaker for propositions like (1) and (2). So far, this sounds eternalist. But it's not, and this comes out in a discussion of what the past is. Kierland and Monton write

...[T]he past is an aspect of reality, but it cannot be reduced to things or the properties they possess (i.e., how these things are). Call this brute past presentism; from here on out, in speaking of a 'brute past', we have in mind a past which cannot be so reduced... The brute past has an intrinsic nature...[W]e like to think of this intrinsic nature in terms of the past having a certain 'shape.' This shape does not consist in a structure of things having properties and standing in relation to one another...The crucial feature of brute past presentism is that it postulates a *sui generis* metaphysical category, one independent of things and how they are. ([Kierland and Monton 2007], p. 492)

It is the shape of the past that makes true propositions about the past true. The grounding problem for presentism is solved with this *sui generis* entity, the Past, (which exists now) and its having the right shape.[98] Because the past has the shape it does, (1) is true and

(6) Socrates had a button-nose

is false. Indeed, the Past having the shape it does entails that (1) is true. So we have a supervenience base for past-truths.

It will be immediately obvious that such a view would be considered a "cheater", according to Sider. The Past clearly "points beyond" itself in a manner that can't be reduced to categorical notions. Kierland and Monton are unphased by this, calling Sider's wholesale rejection of irreducibly-hypothetical entities "sheer metaphysical prejudice" (494). But for those who are concerned with irreducibly-hypothetical entities, there is cause for concern here.

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[98] I will call their past "The Past" so that the reader is clear when I'm speaking of their sui generis entity. At least it solved in this manner for past-truths, one wonders if there will be a 'brute Future' for future-propositions.

It's also worth noting that this view suffers from the problem of shifting truthmakers, in the same way Lucretianism and the ersatz B-series solution does. (4) is made true by Frank's having a property. (5) is made true by the Past (both at t_2 and t_3). But this shift involves a move from the right sort of truthmaker for a proposition like (4) or (5) to one that simply isn't the right sort of truthmaker. So, again, it's not just the shift in truthmakers, but it's the shift from the proper sort of ground to an improper ground.

Third, accepting a *sui generis* Past whose *sui generis* shape makes true propositions about the past seems a high cost to pay to preserve the truth of propositions like

(1) and (2). Indeed, we've already seen an account (that of the ersatz B-series) that also uses the past to ground past-truths. But we know what the past is on the ersatz B-series solution. It's a maximal proposition or state of affairs. We also know, on this view, what about the past makes past-truths true: Entailment (or inclusion if one takes times to be maximal states of affairs). So it's not at all clear to me at least why one would be drawn to a solution like Kierland and Monton's over a solution like Crisp's. Crisp's seems to cost much less.

7. Temporal Distributional Properties

Ross Cameron ([Cameron 2010]) draws on the work of Josh Parsons ([Parsons 2000], [Parsons 2004]) on distributional properties and appeals to temporal distributional properties to provide truthmakers for past truths for the presentist. To get a handle on Cameron's solution, consider first *spatial distributional properties*. These are properties that give the distribution of qualities across a region of space. Consider a white object with flecks of color on it. There is a spatial distributional property the having of which entails that flecks of color of those shades will be distributed thus-and-so on the object. Typically we might think that the having of such a property supervenes on or can be reduced to spatial parts of the object's having certain properties. However, suppose the object

in question is an extended simple. Now it has the distributional property it has and it doesn't have it in virtue of its spatial parts having properties; it has no spatial parts.[99]

Similarly, one might think that there are temporal distributional properties of which the presentist may avail herself. These detail the way an object is at various times it exists, in the same sort of way the spatial distributional property above details the way the flecks of color are distributed across the surface of the object. The property isn't reducible to properties of the temporal parts of the object in the same way that the extended simple's distributional property isn't reducible to properties of the spatial parts of the object. As Cameron says,

> If there are temporal distributional properties then I have a temporal distributional property in virtue of which, together with my age, I am now an adult, was a child and will be (hopefully) an old man. These properties are both difference makers, in settling my present intrinsic nature, and past settlers, in settling how I was intrinsically (9).

This will help with grounding truths like (2). But what about propositions like (1)? Socrates isn't around to instantiate any distributional properties.[100] Cameron thinks that to ground truths like (1) we should appeal to a distributional property that the entire world has, "the distributional property in virtue of which it has the history it in fact has" (10).

There are, it seems to me, several problems with Cameron's proposal. First, there still is cheating occurring here. Obama's having a temporal distributional property still "points beyond" the present moment and irreducibly so. Cameron thinks there isn't; he

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[99] For those who think that an extended simple is incoherent, it's not clear it is. Van Inwagen ([van Inwagen 1990], p. 98) claims that Aristotle might think of organisms as extended simples. Also, it's not implausible to read Spinoza as saying there is one giant extended simple – the universe.

[100] Here again I assume the truth of serious presentism.

thinks that Sider objects to properties that point beyond the object in question that don't say anything about the intrinsic nature of the object. But I think this misreads Sider. Suppose that Bigelow's Lucretian properties *merely* point beyond their instances, and Cameron's distributional properties point beyond their instances and say something about the intrinsic nature of the object. They *still* point beyond their instances in an irreducible fashion. This is Sider's concern. Now, one may be unimpressed by Sider's intuition here (as Kierland and Monton and Crisp seem to be). But Cameron pretty clearly is cheating by the parameters Sider sets out.

Second, it's not clear to me that the presentist can avail herself of Cameron's temporal distributional properties. Consider again the spatial distributional property that characterizes the flecks of paint of the surface of the simple object. We can suppose the object's having this property doesn't reduce to the parts of the object having various properties (as the object has no proper parts). But the object still is spread out in space; the distributional property tells how the flecks of paint are distributed on the surface of an object across a region of space. In the case of temporal distributional properties, for the presentist there is no past or future over which the temporal distributional properties are distributed. So it's not at all clear that there can be these sorts of temporal distributional properties for the presentist.

Third, Cameron is committed to the world having a temporal distributional property that sets out the history of the world. If he already needs this for truths like (1), why have objects that have temporal distributional properties to ground propositions like (2)?

Giving up objects' having temporal distributional properties would, of course, allow him to avoid this second objection. But keeping them actually helps with the shifting-truthmaker objection. It allows Cameron to keep the truthmaker for (4) and

(5) at t_2 an object's having a property. So this uniformity is good. Of course there is a shift in the truthmaker for (5) at t_3; suddenly it will be the world's having a temporal distributional prop-

erty that will ground its truth. Again, it's not just the shift in truth-makers that is a problem here. It's a shift to something that doesn't look to be the proper grounds for the truth of (5) at t_{3} or (1).

It's not at all clear to me that it is coherent for an object to have a property that distributes across times that don't exist. So this presses Cameron in the direction of a view like Bigelow's; it's just that the sort of property involved in the truthmaking differs But his view inherits the problems of Bigelow's in this regard.

8. Conclusion

Of the solutions we've examined, it seems to me that the ersatz B-series solution of Crisp is the least costly for the presentist. It does have trouble with the shifting-truthmaker objection. But it is difficult to see how any presentist grounding of non-present truths wouldn't have trouble with it. For the presentist, the passage of time eliminates the natural truthmakers that always are available to the eternalist. This is, it would seem, a cost of those who adopt presentism in a non-Merricksian manner.[101]

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Grounding Past Truths:
Overcoming the Challenge

Brian Kierland

1. Introduction

Presentism is the view that reality is exhausted by present reality; it contrasts most importantly with *eternalism*, the view that reality includes past, present and future reality. The *grounding objection* to presentism is that it cannot account for the truth of past-and future-tense truths.[102] Although I am not myself a presentist, in this paper, I explore a novel version of presentism. I argue that it offers an attractive answer to the grounding objection, one that is superior to the answers offered by other versions of presentism.

The main motivation for presentism is that, arguably, it's the common sense view of time. As a result, a natural strategy for answering the grounding objection is to look to common sense, a

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[102] For paper-length characterizations of presentism and eternalism see, respectively, [McKinnon 2013] and [Baron and Miller 2013] (both in this volume). For some other statements of presentism, see, e.g., [Cameron 2010], p. 2, [Markosian 2013], pp. 127-9, [Caplan and Sanson 2011], p. 196, [Sanson and Caplan 2010], p. 24, [Rhoda 2009], p. 41, [Tallant 2009], p. 407, [Crisp 2007], pp. 90 and 107, fn. 1, [Kierland and Monton 2007], p. 485, [Merricks 2007], pp. 119–125, [Keller 2004], p. 84, [Markosian 2004], p. 47, fn. 1, [Davidson 2003], p. 77, [Sider 2001], p. 11, [Bigelow 1996], p. 35 and [Hinchliff 1996], p. 123). All these latter authors except [Markosian 2004], [Davidson 2003] and [Hinchliff 1996] directly discuss the grounding objection.

strategy which I adopt in this paper. What does common sense say about how past-and future-tense truths are grounded? Arguably, the common sense view of future-tense truths is that they are grounded in present facts which determine how the future will be; to the extent that this determination is incomplete, then com-mon sense arguably says there is to the same extent indeterminacy in the truth value of future-tense claims. However, for reasons of space and to avoid issues unique to the future, I focus on the problem which past-tense truths pose for presentism.[103] I argue that the common sense view of past-tense truths, when conjoined with pre-sentism, has the implication that such truths are grounded in a present record of the past.

I proceed as follows. In section two, I present the grounding objection in more detail. In section three, I give the argument to which I just alluded in the previous paragraph and upon its basis articulate an important constraint on presentist views; I further support this constraint in section six. Beginning in section four, I proceed to discuss the answers that various presentist views give to the grounding objection. Along the way, I defend another impor-tant constraint on presentist views (section five) and formulate my preferred view, primitive record presentism (section seven). The main argument for this view is its superiority in meeting these two constraints, as compared to the alternatives discussed. I conclude in section ten by considering an objection to primitive record presen-tism (one which also faces other versions of presentism).

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[103] Many of the presentist views discussed in the paper tell parallel stories about how past-and future-tense truths are grounded. However, I will consider them as just views about past-tense truths.

2. The Grounding Objection

In attempt to capture the idea that truth depends on being, some philosophers endorse the *truthmaking principle*:

Every true proposition has a truthmaker.[104]

where:

T is a *truthmaker* for proposition *P* iff *T* is a thing whose existence necessitates that *P* is true.[105]

If the truthmaking principle is correct, then the grounding objection can be formulated as the challenge: if presentism is true, what are the truthmakers for past-tense truths? But many object to this principle. Arguably, that there are no unicorns necessitates that <There are no unicorns> is true, and that the sun is hot necessitates that <The sun is hot> is true, although there are no *things* (such as facts or states of affairs) whose existence necessitates the truth of these two propositions.[106]

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[104] This principle is also sometimes called *truthmaker maximalism*, and it is endorsed by, e.g., [Cameron 2008b], pp. 410–415, and [Armstrong 1997], especially pp. 13–14 and 149–150). Some truth-maker theorists allow that certain kinds of truths do not need truthmakers; see, e.g., [Smith 1999], pp. 284–285.

[105] For this view of the truthmaking relation, see, e.g., [Lewis 2001], p. 604 and [Armstrong 1997], p. 115. An objection to it is that, consequently, everything (including my left thumb) is a truthmaker for necessary truths (such as that 2+2=4). For this and other objections, see [Cameron 2008a], pp. 295–296, [Merricks 2007], pp. 5–11 and 22–28 and [Smith 1999], pp. 278. As a remedy, for *T* to be a truthmaker for *P*, [Cameron 2008a], pp. 295–296, claims that it must also be of the *essence* of *T* that *P* is true, and [Merricks 2007], pp. 26–34, and [Smith 1999], pp. 279–283, claim that *P* must also in some sense be *about T*; packaged as a more general constraint on theories, I discuss the latter idea in section 10.

[106] For this objection based on negative existentials and intrinsic predications, see, e.g., [Lewis 1999], p. 204. In this paper, I will use angle brackets to denote the proposition expressed by the sentence written inside of them.

Many thus think that, although the truthmaking principle is false, truth nonetheless depends on being in the sense that it depends on what exists and how those things are (including how they are related). Most often this thought is formulated as "truth supervenes on being" in the sense of the *truth-supervenience principle*:

Two possible worlds exactly alike with respect to what exists and how those things are (including how they are related to one another) are exactly alike with respect to which propositions are true.[107]

But there is both a "positive aspect" and a "negative aspect" to this principle, given the phrase 'exactly alike'.[108] This means that the principle's content can be understood in terms of necessitation claims of the sort given at the end of the previous paragraph. What defines the sort in question is that, in describing what necessitates the truth of a proposition, such a claim only makes reference to what exists, how those things are, what does *not* exist, and how existing things are *not*.[109]

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[107] For such a formulation, see, e.g., [Sider 2001], pp. 36, and [Lewis 1999], p. 206.

[108] For example, when one world is exactly alike another with respect to what exists, it contains all the objects of the other world *and no more.* Compare [Merricks 2007], p. 62: "Moreover, *that there are exactly n black ravens* has a 'negative aspect'. . . ."

[109] For some confirmation of this, notice [Lewis 2001], p. 611, admits: "So the proposition that there are no unicorns is true just because there are no unicorns!" [Merricks 2007], pp. 71–73, observes that the truthsupervenience principle is a global supervenience thesis and offers, as an alternative, a thesis of "worldwide local supervenience". The content of this alternative can be understood in terms of necessitation claims of the sort discussed in the main text, *except* that no reference to what does not exist, and how existing things are not, is allowed. As Merricks notes, without positing a questionable "nothing more" property or relation (or something relevantly similar), this alternative thesis will not be able to handle true negative existentials.

Supervenience and necessitation, however, are just modal relations. Since one core idea of philosophers sympathetic to some such principle is that truth is not *fundamental*, it's better to formulate an explicitly *explanatory* principle upon the slightly different thought that "truth is explained by being".[110] In this spirit, I offer the *truth-explanation principle*:

Which propositions are true is explained by what exists, how those things are, what does not exist, and how existing things are not.

Its content can be understood in terms of explanation claims of this sort: that there are no unicorns *explains* that <There are no unicorns> is true, and that the sun is hot *explains* that <The sun is hot> is true. What defines the sort in question is that, in describing what explains the truth of a proposition, such a claim only makes reference to what exists, how those things are, what does not exist, and how existing things are not.[111]

In this paper, I assume that the truth-explanation principle is correct (and thus put aside responses to the grounding objection which reject all such principles). In addition to capturing the idea that truth is not fundamental, it amounts to a substantive metaphysical thesis: reality is exhausted by what exists, how those things are, what does not exist, and how existing things are not.[112]

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[110] For specific problems with a modal principle like the truth-supervenience principle, see [Merricks 2007], pp. 87–89. These problems are overcome when we move to an explanatory principle.

[111] In offering an explanatory principle, I've been influenced by [Caplan and Sanson 2011], p. 202, [Sanson and Caplan 2010], p. 26, [Rhoda 2009], p. 46, [Tallant 2009], p. 408, [Merricks 2007], p. 30, and [Keller 2004], p. 86.

[112] All principles in the neighborhood combine the idea that truth is not fundamental with some substantive metaphysical thesis. [Merricks 2007], xiv, emphasizes this substantive metaphysical aspect of the truthmaking principle, and [Kierland and Monton 2007], p. 487, while implicitly assuming the idea that truth is not fundamental, in effect do the same for the

As a result, some will reject it.[113] However, many will find it plausible, and it's certainly worthwhile to see what conclusions we can reach when employing it. In this spirit, let's return to the grounding objection, which can now be formulated as the challenge: if presentism is true, how are past-tense truths explained by what exists, how those things are, what does not exist, and how existing things are not?

That this challenge is both real and difficult arises from three kinds of facts that constrain our theorizing (within an approach employing the truth-explanation principle).[114] First, there are *alethic constraints*, which consist in facts about what sorts of propositions are true. Here the relevant alethic constraint is: some past-

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truth-supervenience principle (there called 'the Being-Supervenience Principle').

[113] [Kierland and Monton 2007], pp. 490–491, [Merricks 2007], pp. 137–139, and [Sanson and Caplan 2010], pp. 37–38) defend presentism from the grounding objection by rejecting principles that attempt to capture the idea that "truth depends on being". [Merricks 2007], p. 84, would accuse the truth-explanation principle of making an unprincipled exception. Here is a reconstruction of Merrick's reasoning. The idea that "truth depends on being" is the idea that "truth depends on what exists and how those things are". But that idea cannot handle true negative existentials and perhaps certain other truths, so we retreat to the back-up idea that "truth depends on what exists, how those things are, what does *not* exist and how existing things are *not*". But then why not also qualify the idea with "how things *could have been*", "how things *should be*", "how things *were*", etc.? Although I don't have the space to defend this here, my answer is that (i) all along the idea that "truth depends on being" has been the idea that "truth depends on matters of being", understood as equivalent to the "back-up idea" just mentioned, and (ii) whether or not ultimately correct, there is principled motivation (based in our experience of the world) for the idea that "truth depends on matters of being".

[114] Here I follow [Cameron 2010], p. 2, except that he only explicitly mentions alethic and metaphysical constraints. In this paragraph and the rest of the paper, I use the word 'fact' in the common way simply as a convenient device, not in a way that commits me to the existence of things I'm labeling 'facts', things of the sort often posited by proponents of the truthmaking principle.

tense propositions are true. Second, there are *metaphysical con-straints*, which consist in facts about what sorts of objects and properties exist (or even can exist). Sider's hypotheticality worry for presentist solutions to the grounding objection involves one such constraint and is discussed in section five. Third, there are *explanatory constraints*, which consist in facts about what sorts of explanations can be given for what sorts of truths. It's because of such constraints that it is unacceptable for the presentist to say "That Obama is smart explains that <Lincoln was tall> is true", although doing so meets the relevant alethic constraint and (pre-sumably) all metaphysical constraints. I defend an important ex-planatory constraint in the next section. There will, of course, in many cases be controversy over which candidate constraints are genuine.

3. The Record Constraint

There is an intuitive sense that *reality carries its history along with it* as time passes. The following is thus plausibly part of common sense: past-tense truths are grounded in what constitutes reality's carrying its history along with it, whatever that is. One way in which reality could do this is if eternalism is true, since then the past itself is a part of reality. But there is also a way for reality to do this if presentism is true. In that case, although the past itself is not part of reality, reality can nonetheless be said to carry its his-tory along with it so long as it retains a *present record* of its his-tory. Hence my claim in section one that the common sense view of past-tense truths, when conjoined with presentism, has the im-plication that such truths are grounded in a present record of the past.[115]

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[115] None of this is to claim that common sense *says* that past-tense truths are grounded in a present record of the past (even if presentism is part of common sense). Such a claim seems dubious. But it is to make the much more plausible claim that, if presentism is part of common sense, then common sense is *committed* to that view of past-tense truths. There is no reason to think that what common sense says is closed under entailment or anything similar.

At least, this seems right so long as we construe the record a certain way, namely, as having four features. First, the record must be an effect of the past.[116] Second, the record must carry complete information about the past ("carry information" in the sense in which effects generally carry information about their causes). In other words, the record must be perfectly information-preserving. These two features might alone seem to suffice, on the ground that the general idea of a record is just that of an information-carrying effect. However, I think there is another aspect to *this* record, one which can make good on the intuitive sense that reality carries its history along with it as time passes. This is the hazy thought that the effect which serves as this record doesn't just happen to be such a record, rather its very "purpose" is to be such a record; in other words, there is such an effect only because it's part of the very "construction" of reality that it keeps a record of its own history. We don't need to interpret this literally, but we do need something which plausibly captures its meaning when taken as metaphor. In this spirit, I suggest two more features. Third, the record is some sort of "imprint" that the present makes on a record-keeping medium as it passes into nonexistence. Among other things, this means that it "mirrors" what it is a record of and consequently that it shouldn't take the deployment of fancy mathematics to recover from the record the information it carries about reality's history. Fourth, the record and the process which produces it are *sui generis*

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[116] A presentist is entitled to talk about present effects of past causes only if the *problem of cross-temporal relations* can be solved; see, e.g., [Ciuni and Torrengo 2013] and [Brogaard 2013] (both in this volume), [Davidson 2003], [Sider 2001], pp. 25–35) and [Bigelow 1996], pp. 37. I here assume that the problem can be solved. An answer to the grounding objection may, but does not necessarily, give (or provide the basis for giving) a solution, since it does not necessarily answer this charge: the relata of instantiated relations are co-existing, but, on presentism, the relata of instantiated cross-temporal relations are not co-existing. I believe that the answer to the grounding objection I offer in section seven of this paper (namely, primitive record presentism) also provides a basis for answering the problem of cross-temporal relations, but I don't have the space to explain here.

in the sense that they have no "role" in reality aside from this re-cord-keeping one.

The above constitutes an explanatory constraint on our theoriz-ing within a presentist framework: what explains past-tense truths involves a record of reality's history possessing these four features. I will call this the *record constraint*, and I will call such a record a *reality record*.[117]

4. Nomic Presentism

Let 'the ordinary present' include present objects like dogs, rocks and electrons (and their current properties like shape, size and elec-tric charge) but exclude anything posited solely in order to meet the grounding objection. Then a natural proposal – call it *nomic presentism* – is that the ordinary present itself amounts to a reality record, given how the laws of nature determine that it fixes the past. For simplified exam-ple, given Newton's laws of motion and the absence of any forces, collisions or other interfering events, the present locations and velocities of objects entail their previous locations and velocities. Generally, the view says: that the ordinary present is a certain way and that the laws of nature are of a certain sort explain that various past-tense propositions are true.[118]

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[117] This is similar to the "trace constraint" of [Rhoda 2009], p. 43, though his constraint only incorporates the first feature I discuss (the second may also be implicitly assumed). [Caplan and Sanson 2011], p. 200) discuss the idea of "the present contain[ing] a perfect record of the past", but they say nothing explicitly about what makes something such a record (not even that it must be an effect of the past).

[118] For statements of this view, see [Markosian 2013], pp. 131-2, [Sider 2001], p. 37, (who does not endorse it) and [Ludlow 1999], pp. 97–100. Additionally, [Dummett 1978], pp. 362–374, expresses sympathy with a verificationist position about the past that's similar to this view. Given how I articulate the grounding objection in section two, I formulate all versions of presentism as explanatory claims (regardless of how their own authors formulate them).

Nomic presentism actually fails to meet the record constraint. To begin, as it *has already happened*, the past is surely completely determinate: for every past-tense proposition, either it is true or its negation is true.[119] However, since the laws of nature may to some extent be present-to-past indeterministic (say, because of quantum mechanics), there may be past-tense propositions such that neither they nor their negations are entailed by facts about the ordinary present (together with the laws of nature).[120] This has the related consequences that some past-tense truths are given no explanation by nomic presentism and that the ordinary present fails to possess the second feature of a reality record (viz., being perfectly information-preserving). Further, the ordinary present fails to possess the third and fourth features of a reality record, the features which capture the sense in which it's part of the very "construction" of reality that it keep a record of its own history. The ordinary present fails to "mirror" the past, as recovering information about the past from the ordinary present requires the fancy mathematics involved in articulating the laws of nature. And the ordinary present obviously fails to be a *sui generis* record.[121]

5. Global Property Presentism

Other versions of presentism are available. One is *Lucretianism*, on which the possession of fundamental past-directed properties (i.e., properties fundamentally "about the past") grounds past-tense

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[119] At least – keeping in mind the strategy of this paper – it's surely *part of common sense* that the past is completely determinate. It's important that I here speak of *propositions*, since past-tense *sentences* can be vague and so indeterminate in truth-value for that reason.

[120] In other words, as some have put it, the view allows that the past is "open" in the same way that some think the future is open; see, e.g., [Sider 2001], p. 38. [Markosian 2013], pp. 135-7 embraces this consequence, and [Dummett 1978], pp. 366–367, seems willing to accept it. For related discussion, see [Ludlow 1999], p. 149, especially fn. 4, and pp. 228–229).

[121] [Sider 2001], pp. 37–39, also criticizes nomic presentism on the grounds that it unhappily restricts how we understand both velocity and the laws of nature.

truths. This general idea leaves open which objects possess these properties. The most-discussed specific view of this sort is Bigelow's *global property presentism*, on which it's the world that possesses them.[122] Put fully, the view says: that the world possesses certain fundamental past-directed properties explains that various past-tense propositions are true. For example, that the world possesses the fundamental property *being such that dinosaurs once existed* explains that <Dinosaurs once existed> is true.[123]

One problem with global property presentism is that, as it stands, it violates the record constraint. The world possesses some of these past-directed properties, but that's it. This is easily fixed, however: simply add that the world's possession of these properties is an effect of the past. Then the world's possession of these properties amounts to a reality record.

Another problem is Sider's well-known objection that it makes objectionably "hypothetical" posits. This objection offers a metaphysical constraint on our theorizing, what I'll call the *hypotheticality constraint*. Sider puts the intuitive worry thus: "Whether the world has the property *previously containing dinosaurs* is not a matter of what the world itself is like, but points beyond itself, to the past". But he notes that the "distinction between categorical and hypothetical is admittedly elusive", so what exactly are we to make of it?[124]

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[122] See [Bigelow 1996], pp. 44–48. Other specific views take different objects to possess these properties: haecceities or eternally existing atoms ([Keller 2004], pp. 96–101, who does not endorse either view); abstract objects ([Chisholm 1990], p. 416); tracts of earth or the spaces occupied by such (Lucretius, as reported in [Bigelow 1996], p. 45).

[123] I will use general propositions for purposes of illustration, as singular propositions raise special issues: since, on presentism, Socrates does not exist, what is the proposition <Socrates was a philosopher>, if it even exists at all? For relevant discussion, see [Keller 2004], pp. 96–101, and [Markosian 2004], pp. 51–58 and 65–73.

[124] See [Sider 2001], p. 41.

I offer two points in clarification. First, the constraint should be taken to rule out positing certain *fundamental* properties. For example, whether I have the property *being such that Obama is smart* is not a matter of what I myself am like, but points beyond myself, to Obama. Nonetheless, at least arguably, I possess that property (the only worry being whether there is such a property at all). It's just that, if I do, that's *in virtue of* Obama's being smart: that Obama is smart explains that I have the property *being such that Obama is smart*. I.e., the property is not fundamental. Second, the constraint should be taken to rule out positing *monadic* properties that do not concern the *intrinsic nature* of objects which possess them. The relevant sense in which *previously containing dinosaurs* is hypothetical is that its possession by the world (conceived in presentist fashion, viz., as a present-bound entity) would not concern its intrinsic nature, but rather the previous existence of dinosaurs.[125] Putting these points together: there are no fundamental monadic properties that do not concern the intrinsic nature of objects which possess them.[126] So understood, I accept this as a genuine constraint on our theorizing and thus agree with Sider that global property presentism should be rejected.[127]

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[125] Some may be willing to deny this; in fact, [Crisp 2007], p. 98, seems open to doing so for *being past*, a fundamental past-directed property of propositions. It's hard to know what to say at this point except that, if such properties really concern intrinsic natures of present objects (and nothing more), then (whatever label they are given) how can they have anything to do with the past?

[126] In giving this characterization, I closely follow the lead of [Cameron 2010], pp. 3–5. Sider's hypotheticality objection extends beyond monadic properties and points the way toward plausible constraints on other things, e.g., states of affairs. I discuss such a constraint on relations in section eight.

[127] This constraint also rules out other versions of Lucretianism. It additionally rules out the presentist view of [Cameron 2010], pp. 6–11, which says: that the world possesses a certain fundamental temporal distributional property and a certain fundamental age property explains that various past-tense propositions are true. [Caplan and Sanson 2011], p. 201, grant that Cameron's temporal distributional properties concern the intrinsic natures of what possesses them, but claim that they are hypothetical anyway, nonetheless "pointing beyond their instances"; they thus seem to

6. Further Support for the Record Constraint

I initially defended the record constraint as an implication of common sense when conjoined with presentism. We are now in a position to give further defense to the claim that, within a presentist framework, what explains past-tense truths must be information-preserving effects of the past, i.e., must at least possess the first two features of a reality record. (Support for the other two features will have to rest on my initial defense.)

There is a dilemma for views which do not posit information-preserving effects of the past: does the view posit things (properties, states of affairs, etc.) which are fundamentally past-directed? Horn one: yes. But then the view violates the hypotheticality constraint. Horn two: no. But then the view violates a vague, but still important, explanatory constraint. This is the *non-arbitrariness constraint*: what explains past-tense truths is non-arbitrarily related to the past.[128]

Let me explain. Consider a view which posits neither information-preserving effects of the past nor fundamentally past-directed things to explain past-tense truths, one which (*i*) posits the *X*-objects and some fundamental intrinsic properties, the *Y*-properties,

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think that the "intrinsic nature" characterization of the hypotheticality constraint is not adequate to rule out Cameron's view. I disagree, so long as we read 'concern' as meaning "*wholly* concern" in that characterization. That the world has one of Cameron's temporal distributional properties does not *wholly* concern the world's intrinsic nature: the world (again conceived in presentist fashion) could have its actual intrinsic nature without having this property, as it could have a different temporal distributional property which nonetheless has the same "implications" for the present. Furthermore, Cameron's age properties clearly violate the hypotheticality constraint as characterized. (In his fn. 17, Cameron offers an alternative to age properties that involves "building tense into" the temporal distributional properties, but doing so only makes the latter's violation of the hypotheticality constraint more obvious.)

[128] This is similar to, but weaker than, the relevance constraint discussed in section 10.

which the *X*-objects can possess or not, and (*ii*) claims that the distribu-tion of *Y*-properties across the *X*-objects explains past-tense truths. (*ii*) should be rejected, as it's arbitrary simply to assert that the distribution of *Y*-properties across the *X*-objects *explains* past-tense truths. After all, why would that be any better than claiming that properties of the set of prime numbers explains past-tense truths? Or claiming that the amount of mass in spherical shells various distances out from Pluto explains past-tense truths? Even if there was a one-one mapping between past-tense truths and facts of the offered sort (and even if, by fortuitous luck, this map-ping had certain nice features, such as making possible a David-son-style compositional truth theory of sentences expressing past-tense propositions), we would not take any of this as *explaining* past-tense truths. And there's no reason to think the situation im-proves simply when facts of the offered sort involve things and/or properties newly posited in the face of the grounding objection.

Of course, if some of these posits were fundamentally past-directed, then arbitrariness would be avoided, but the hypothetical-ity constraint would be violated (horn one of the dilemma again). Aside from that, it seems arbitrariness would be avoided only if facts involving these posits were appropriately *connected* to the past, and the only candidate for that of which I'm aware is these facts being *effects* of the past.[129] And, once we've gotten this far, we'll need that these facts (at least jointly) are information-preserving effects of the past, so that we have an acceptable indi-vidual explanation of each past-tense truth. In other words, if a view is to avoid the dilemma – i.e., is not to violate the hypotheti-cality constraint or the non-arbitrariness constraint – then it must posit things which are information-preserving effects of the past.

7. Primitive Record Presentism

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[129] Compare [Rhoda 2009], p. 43).

I'll approach my preferred version of presentism by considering how we could modify global property presentism so that it meets the hypotheticality constraint. The first step is to is replace the past-directed properties it posits with fundamental properties whose possession by the world *does* concern its intrinsic nature. This means we are positing properties that are not fundamentally past-directed. As we've seen, the properties posited by global property presentism fail to concern intrinsic natures *because* they are fundamentally past-directed. So, in concerning intrinsic natures, our replacement properties are not fundamentally past-directed.

But in only taking this first step, not only does the resulting view (like global property presentism) fail to meet the record constraint, it also consequently violates the non-arbitrariness constraint: why think that the world's possessing these newly posited fundamental properties has anything to do with past-tense truths? Minimally, as we did with global property presentism, we need to take the further step of adding that the world's possession of these properties is an *effect* of the past, in which case we can call them *trace properties*. But this move is not here sufficient, since it leaves undetermined which aspects of the past cause the world's possession of which trace properties. As a result, not only does the view still not possess the "informationpreserving" feature of the record constraint, but it is unable to offer specific explanations of the form: that the world possess trace property *T* explains that proposition *P* is true. A final step gives us the solution: additionally posit a *sui generis* law of nature governing how the world's possession of
trace properties is an effect of the past; I'll call it the *law of history*.[130]

The result is a version of *primitive record presentism*, and put altogether it says: (*i*) there are fundamental trace properties which

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[130] Someone might worry that laws of nature (as a presentist must understand them – see [Sider 2001], pp. 37–38 – violate the hypotheticality constraint, but see fn. 50 for discussion.

the world can possess or not, (*ii*) there is a *sui generis* law of history which governs how the world's character at one instant causally determines which trace properties it possesses at later instants, and (*iii*) that this law of history exists and that the world possesses certain trace properties together explain that various past-tense propositions are true. For example, for some trace property T, we get: that this law of history exists *and* that the world possesses T together explain that <Dinosaurs once existed> is true.[131]

There is an obvious similarity with nomic presentism, insofar as both explain the truth of past-tense propositions in terms of certain effects of the past together with the law (or laws) of nature governing how the past determines these effects. But, unlike nomic presentism, primitive record presentism satisfies the record constraint. To begin, the distribution of trace properties possessed by the world has the second feature of a reality record, viz., being perfectly information-preserving. Or, at least, it does as long as the law of history has an information-preserving character. For nomic presentism, empirical considerations might require (as noted in section four) that we take the relevant laws of nature not to have an information-preserving character. But, for the current view, since the motivation for positing the law of history is the explanation of past-tense truths, and since (as also noted in section four) there is no indeterminacy in the truth of past-tense propositions, we have

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[131] Some remarks of [Keller 2004], pp. 96–101 (especially 96) suggest what I'll call the *structure con-straint* and formulate as: what explains past-tense truths must have a structure which parallels, or is suffcient to capture, the structure of those truths. My defense of primitive record presentism is committed to this explanatory constraint, given the third feature of a reality record (viz., "mirroring" what it is a record of). As a result, simply matching trace properties one-one with past-tense propositions is inadequate. Instead, some trace properties will in fact have to be taken as non-fundamental, built up out of fundamental trace properties in various ways. I don't have the space here to carry out this task, but I believe it can be done, at least if we opt for the first alternate version of primitive record presentism given at the end of this section; cf. fn. 34. A different way of meeting this constraint is offered by the second alternate version of primitive record presentism given at the end of section 8; cf. fn. 45.

every reason to take the law of history to have an information-preserving character. Further, the world's distribution of trace properties has the third and fourth features of a reality record. It is obviously a *sui generis* record. And it also "mirrors" the past, or it does as long as the trace properties and the law of history have the right character. But for reasons similar to those just given, theoretical considerations (including the record constraint) will favor such a character. So the world's distribution of trace properties is a reality record.

Another difference between nomic presentism and primitive record presentism is that the latter, but not the former, posits non-empirical properties in a significant sense.[132] On nomic presentism, the reality record is a matter of objects like dogs, rocks and electrons having properties like shape, size and electric charge. Instantiation of *these* properties either can be perceived (e.g., I see that my dog is tannish brown) or partially causally explains what can be perceived. On primitive record presentism, the reality record is the distribution of trace properties. Instantiation of these properties neither can be perceived nor partially causally explains what can be perceived. Given the law of history, and now to speak a bit loosely, empirical properties cause trace properties, and trace properties cause other trace properties (the reality record at one time is a function of the reality record at an earlier time together with what happened between those two times), but that's it. So trace properties cannot be perceived and do not cause anything that can be perceived. However, there is no plausible metaphysical constraint (like Sider's hypotheticality constraint) on positing properties which are non-empirical in this sense. Of course, epistemically, there are fewer kinds of reasons that can be given for positing non-empirical properties. But such reasons are given in this paper.[133]

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[132] Eternalism is like nomic presentism in not positing any non-empirical properties. Many other versions of presentism (e.g., global property presentism) are like primitive record presentism in positing non-empirical properties.

[133] Given the non-empirical character of trace properties, and given that they (together with the law of history) explain past-tense truths, one might wonder how we can have historical knowledge. For example, how can I

Other versions of primitive record presentism are available. For example, instead of simply positing trace properties and taking the world to possess them, consider an alternate version which additionally posits a *sui generis* object and instead takes *it* to possess the trace properties. The distribution of trace properties possessed by this entity would then (given a similar law of history) be our reality record.[134] This alternate version might have advantages over

know that dinosaurs once existed if I can't empirically verify the relevant aspect of the present distribution of trace properties? I don't have space to fully respond here, but the core of my answer is: our historical knowledge is grounded in ordinary historical evidence *together with* the fact that ordinary historical evidence and trace properties have a *common cause*. Dinosaurs' once existing is both a cause of the present existence of dinosaur fossils and (given the law of history) a cause of the relevant aspect of the present distribution of trace properties.

[134] This version of primitive record presentism bears a significant resemblance to how [Caplan and Sanson 2011], pp. 200–202, and [Sanson and Caplan 2010], p. 31, fn. 10, seem to misinterpret (and thus argue against) the brute past presentism of [Kierland and Monton 2007], pp. 490–497. On this misinterpretation, the view is that (i) there exists a *sui generis* thing or object (labeled "the past") and it has an intrinsic nature (described as "the shape of the past"), and (ii) this intrinsic nature, all on its own, explains past-tense truths. I agree with Caplan and Sanson that this view is not adequate. For (ii) to be correct, this intrinsic nature must be fundamentally "about the past", and that combination is not available. In my discussion of the hypotheticality constraint in section five, I agreed that fundamental past-directed properties fail to concern the intrinsic nature of anything possessing them. That's why, in addition to positing a *sui generis* thing or object and its intrinsic nature, one would need to posit something which connects the intrinsic nature of this object *to the past*, something like the law of history I posit in the present paper. Although perhaps understandable, the misinterpretation of Caplan and Sanson is a result of not heeding what [Kierland and Monton 2007] (especially fn. 3) say directly about existence and existents (and so indirectly about how to understand singular terms); according to them, any aspect of reality can be said to exist and thus counts as an existent, but that doesn't mean it's a thing or object in any strict, metaphysically interesting sense. So in talking about the "brute past" and treating it as an existent, Kierland and Monton do not take themselves to be referring to an object or thing. Rather, brute past presentism takes the past to be a *sui generis* aspect of

the original. First, it would allow us to avoid positing the literal existence of "the world". Second, even if we don't mind positing this, the world is most naturally understood as the mereological fusion of all objects. But then – unless we are willing to countenance emergent properties – we should see the world as inheriting its intrinsic nature from the intrinsic nature of its parts (and the intrinsic relations between them). This requires the original version of primitive record presentism to take things like planets or people or electrons to have the non-empirical trace properties (and what we can call *trace relations*) ultimately doing the explanatory work. And, while this is not disallowed (see above), it might be preferable simply to see a *sui generis* object as having these properties.[135]

8. Abstract Times Presentism

It's worth considering two other answers to the grounding objection. One comes from *abstract times presentism*, the basic idea of which is that features of *abstract times* ground past-tense truths. I'll begin by discussing the most straightforward version.[136] Ac-

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reality that concerns, as they put it, "what *has* happened: what things exist*ed* and how they *were*" (p. 491, their italics). As a result, as indicated in fn. 12 of the present paper, their view is really a way of rejecting anything in the neighborhood of "truth depends on being". It's for this reason that brute past presentism is set aside in the present paper.

[135] Additionally, this alternative version might be better equipped to satisfy the structure constraint from fn. 30, since we could then take the *sui generis* object to have mereological structure. As a result, it could have different non-fundamental trace properties in virtue of its different parts having different fundamental trace properties or standing in different fundamental trace relations. Putting aside the point in the main text, one might suggest the mereological structure of the world could serve the same purpose. But since, on presentism, its parts are all and only presently existing objects (such as dogs), such mereological structure may not help much in capturing the structure of past-tense propositions (such as those about this or that dinosaur).

[136] [Markosian 2004], pp. 75–79, offers something like this version, although not as answer to the grounding objection; instead, he offers it as a way the presentist can make sense of ordinary talk of times.

cording to it, there are abstract times, maximal tenseless propositions of a certain sort. As Thomas Crisp puts it, an abstract time is, "intuitively, an abstract representation of an instantaneous state of the world" ([Crisp 2007], p. 99). Additionally, there are fundamental past-directed properties which some abstract times possess, properties such as *being past* and *being past five days ago*.[137] Finally, that various abstract times possess certain of these properties explains that various past-tense propositions are true. For one example, that an abstract time containing <Dinosaurs exist> possesses *being past* explains that <Dinosaurs once existed> is true. For another, that an abstract time containing <Dinosaurs exist> possesses *being past 100 million years ago* explains that <Dino­saurs existed 100 million years ago> is true.[138]

One problem with abstract times presentism is that, as it stands, it violates the record constraint. Abstract times possess these past-directed properties, but that's it. This is easily fixed, however: simply add that their possession of these properties is an effect of the past. Then the distribution of such properties across abstract times amounts to a reality record.

Another problem with this version of abstract times presentism is that it violates the hypotheticality constraint. One way to see this is as follows. These fundamental past-directed properties are supposed to be monadic, but they do not concern the intrinsic nature of propositions which possess them, as the intrinsic nature of a proposition is exhausted by (*i*) its propositional nature, and (*ii*) its

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[137] Since these are *fundamental* past-directed properties, an abstract time's having one of them *does not consist in* (and so does not in and of itself require or necessitate) the existence of a corresponding concrete time. [Markosian 2004] (p. 78) would use the word 'true' to express these properties, as in '*was-true-tendays-ago*' (his own example concerns a future-directed property he expresses as '*will-be-true-in-ten-years*', but the parallel is clear). However, even if the word 'true' is used in expressing them, these past-directed properties are not truth properties: for none of them does possession of it entail possession of truth.

[138] An abstract time *contains* a proposition just in case it entails that proposition.

specific content.[139] Thomas Crisp's version of abstract times presentism seems to offer a way around this problem.[140] One abstract time is the *present time* in the sense that it is simply true (recall, an abstract time is a maximal proposition representing an instantaneous state of the world). Additionally, some other abstract times then bear the fundamental *earlier than* relation to the present time.[141] Finally, that various abstract times bear the *earlier than* relation to the present time explains that various past-tense propositions are true. For example, that an abstract time containing <Dinosaurs exist> bears the *earlier than* relation to the present time explains that <Dinosaurs once existed> is true. (To explain past-tense truths such as <Dinosaurs existed 100 million years ago>, I presume we'll additionally need *metrical earlier than* relations, such as *100 million years earlier than*. Crisp himself doesn't address the issue.)

However, this move does not really avoid the problem, as there is an equally plausible hypotheticality constraint on relations. On one view, there are fundamental dyadic spatial relations between objects. Whether or not the view is correct, why is it that no hy-

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[139] This point is in the neighborhood of some remarks of [Rhoda 2009], p. 52, but he does not directly consider this version of abstract times presentism; cf. fn. 43.

[140] [Crisp 2007], pp. 98–107; [Bourne 2006], pp. 52–61, offers a similar view. Crisp approaches this view by discussing Lucretianism. He rejects Sider's hypotheticality objection as he interprets it, but then goes on to consider a worry which invokes the hypotheticality constraint as that is being understood in this paper. Having previously analyzed the property *being a place where dinosaurs roamed* as *being an x such that the proposition that x is roamed by dinosaurs is past* (93–98), Crisp articulates a worry for the claim that *being past* (a property of propositions) could be fundamental: multiple propositions sharing it would not make "for sameness of intrinsic qualitative character" (97–98). Crisp himself doubts we can confidently make this last claim, but aware that many will disagree, he proceeds to offer his version of abstract times presentism.

[141] And, for Crisp, the present time bears the *earlier than* relation to some other abstract times, but I'm setting that aside here; cf. fn. 2. Crisp helpfully describes the abstract times that are ordered by the *earlier than* relation as an "ersatz B-series" ([Crisp 2007], p. 102).

potheticality constraint rules out positing such relations? Because those relations plausibly concern the intrinsic relatedness of objects they relate. Philosophers are not accustomed to thinking of the *intrinsic relatedness* of objects, but the idea parallels that of intrinsic natures. Just as an object's intrinsic nature is a matter of how it *substantially is independent of all other objects*, some objects' intrinsic relatedness is a matter of how they are *substantially related independent of all other objects*.[142] Now, consider this candidate fundamental dyadic relation: *being formerly one meter away from*. One electron's bearing this relation to another would not plau-sibly concern their intrinsic relatedness, any more than a single electron's possessing the property *being formerly spin-up* plau-sibly concerns its intrinsic nature (at least, that is, when electrons are conceived in presentist fashion, viz., as present-bound entities). So I offer this hypotheticality constraint on relations: there are no fundamental relations that do not concern the intrinsic relatedness of the objects which are related by them.[143]

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[142] We may want to add that the intrinsic relatedness of some objects is also independent of the individual intrinsic natures of those objects; that way, internal relations wouldn't count as concerning the intrinsic relatedness of objects. Also, the inclusion of 'substantially' here is important. An object's intrinsic nature involves a "substantial contribution to being". This is an intuitive idea I don't know how to characterize in any deeper way, but without it the hypotheticality constraint on properties has no bite: the reason most will agree that the world's possession of a property like *previously containing dinosaurs* would not (within presentist metaphysics) concern the world's intrinsic nature is because of an intuitive sense that possession of such a property would make no substantial contribution to being (as it would make no substantial contribution to present being). Similarly, then, the intrinsic relatedness of some objects should also make a substantial contribution to being (which, within presentist metaphysics, means a substantial contribution to present being).

[143] I'm assuming that no internal relation is fundamental, on the ground that an internal relation's holding between some objects can explained solely in terms of the individual intrinsic natures of those objects. But if you disagree, then you should take this constraint just to be one on non-internal relations; cf. the first sentence of fn. 41. Whether or not they are fundamental, entailment relations are an example of internal relations between propositions.

As we've just seen, *being formerly one meter away from* violates this constraint on relations. More importantly, Crisp's *earlier than* relation does so as well. I'm not saying that there can't be fundamental relations between propositions, just that the *earlier than* relation is not one of them (at least within presentist metaphysics). Recall from above that one way to see that our first version of abstract times presentism violates the hypotheticality constraint on properties is to pay attention to facts about the intrinsic natures of propositions. But a second way to see this is simply to observe that *being past*, like *formerly containing dinosaurs*, is a fundamentally past-directed property. Thus, possession of *being past* by <Dinosaurs exist> no more concerns that proposition's intrinsic nature than possession of *formerly containing dinosaurs* by the world concerns the world's intrinsic nature. As a result, *even if* you think that the intrinsic nature of a proposition can go beyond its propositional nature and specific content, you should think that a proposition's possession of *being past* would not concern its intrinsic nature.

Unfortunately for Crisp, moving from a fundamental property of propositions to a fundamental relation between them fails to avoid the basic worry behind this second observation; it just exchanges violation of the hypotheticality constraint on properties for violation of the parallel constraint on relations. Just as *being past* is fundamentally "about the past", Crisp's *earlier than* relation is fundamentally "about temporal ordering", and so one abstract time's bearing it to another would not concern their present intrinsic relatedness (which on presentism is their entire intrinsic relatedness). This may help to see the point: on Crisp's view, we can take *being past* to be the non-fundamental property *bearing the earlier than relation to the present time*. Even so, the property still has (although derivatively) the past-directed character discussed above. But this would not be the case if its constituent fundamental

relation – the *earlier than* relation – only concerned the present intrinsic relatedness of propositions it relates.[144]

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[144] [Crisp 2007] considers the objection that his "*earlier than* relation on abstract times is not plausibly thought of as fundamental" (p. 106), but his reply amounts to the bare assertion that there is no reason to think this (and that his imagined objector hasn't provided one). I've now explained the reason to think this; it's the same sort of reason as the one which explains why it's not plausible to think that the property *formerly containing dinosaurs* is fundamental.

[Rhoda 2009] (p. 52) objects that Crisp's *earlier than* relation is supposed to be both internal and contingent, but all internal relations between abstract objects are necessary. However, this is probably not Crisp's view. First, Crisp never says that it's supposed to be an internal relation. Second, were this Crisp's view, Rhoda's objection would then be an obvious worry, but Crisp discusses no such worry. Perhaps Rhoda is thinking that there can be no non-internal relations between abstract objects or, more charitably (although his discussion is not specific to fundamental properties), that there can be no fundamental non-internal relations between abstract objects. While considerations of parsimony might reasonably make us prefer, other things equal, not to posit such relations, I see no plausibility in a blanket metaphysical constraint on doing so.

What of the view that the *earlier than* relation *is* an internal one (which Roberto Ciuni has independently suggested to me)? First, there is Rhoda's objection. Plausibly, facts about the present (excluding facts about laws of nature) do not necessitate facts about the past. However, this view says otherwise, as long as the intrinsic natures of abstract objects is a necessary matter (as is standardly thought). (Crisp himself would doubt that we can confidently make this standard claim; cf. the last sentence of fn. 39.) Second, it's then not clear why we should take facts about which abstract times bear the *earlier than* relation to the present time to have anything to do with the past; cf. fn. 24. For example, suppose that the *earlier than* relation is some intrinsic similarity relation. (More exactly, suppose that it's something like an intrinsic similarity relation, except that it's transitive, irreflexive and antisymmetric. For an analogy, instead of supposing it to be like *being similar in color to*, suppose it to be like the ancestral of the relation *being slightly closer to red on the color spectrum than*.) Why should we take the fact that an abstract time is intrinsically similar in such-and-such fashion to the present time to have anything to do with the past?

However, just as we modified global property presentism so that it satisfies the hypotheticality constraint on properties, we can modify Crisp's abstract times presen-tism so that it satisfies the hypotheticality constraint on relations. What we need to do is re-place Crisp's *earlier than* relation with a different fundamental relation – call it the *E-relation* – such that one abstract time's bear-ing it to another does concern their intrinsic relatedness. (We'll also need metrical versions of the E-relation.) However, given the discussion above, this means the E-relation is not fundamentally "about temporal ordering". As a result, making this single modification leaves us with a view that violates the non-arbitrariness constraint: why think that some propositions bearing the E-relation to other propositions has anything to do with past-tense truths? To fix this – and to make the view satisfy the record constraint – we need additionally to add (as we similarly did with our initial modification of global property presentism) a law of history which governs how the world's character at one instant causally determines the distribution of the E-relation across ab-stract times at later instants. In that case, that this law of history exists and that certain abstract times bear the E-relation to the pre-sent time together explain that various past-tense propositions are true. For example, that this law of history exists *and* that an ab-stract time containing <Dinosaurs exist> bears the E-relation to the present time together explain that <Dinosaurs once existed> is true.

We thus end up with a second alternate version of primitive re-cord presentism, one on which the reality record consists of the distribution of the E-relation across abstract times. However, there might be reasons to prefer one of the other versions. First, one might (on nominalist grounds) doubt that there is any good inde-pendent reason to posit the existence of propositions. And, if there isn't, then, other things being equal, it might be better to avoid positing them at all.[145] Second, even if one anyway believes in the

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[145] I have spoken of propositions throughout the paper, but I here remain offcially neutral on the question of their existence. The grounding objec-tion and the answers to it provided by versions of presentism could be put in terms of the truth of past-tense sentences or utterances.

existence of propositions, considerations of parsimony might mean that, other things being equal, it is better to avoid positing fundamental non-internal relations between them (cf. the second paragraph of fn 43).[146]

9. Theistic Presentism

Another answer to the grounding objection comes from Alan Rhoda's *theistic presentism*, on which God exists and his possessing certain memories explains that various past-tense propositions are true.[147] For example, that God remembers that dinosaurs once existed explains that <Dinosaurs once existed> is true. Rhoda's reasoning is similar to my own. He thinks that a successful answer to the grounding objection requires positing "a universal, reflexive, error-proof recording device".[148] And he argues that any other version of presentism which posits such a device suffers problems. However, he does not discuss primitive record presentism, and I will argue in this section that it is superior to theistic presentism. But before doing that, I will distance myself from an objection to theistic presentism in the literature.

Ben Caplan and David Sanson object to theistic presentism on the grounds that it violates the hypotheticality constraint.[149] They write, "memories in the mind of God are just as hypothetical as the tensed properties and tensed facts that other Pre-sentists appeal to; they all 'point beyond' what is actually going on at a given time" ([Caplan and Sanson 2011], p. 201). In a footnote, they add that "the claim that God remembers that Plato had a beard would seem

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[146] But there might also be a reason to prefer this second alternate version of primitive record presentism, namely, that it straightforwardly satisfies the structure constraint from fn. 30. For any true past-tense proposition *P*, the structure of the tenseless proposition involved in the explanation of *P*'s truth will parallel the structure of *P*.

[147] [Rhoda 2009], pp. 53–59. As he notes (p. 53), this view requires a temporal conception of God.

[148] [Rhoda 2009], p. 53. I here put aside the issue Rhoda has in mind in using the adjective 'reflexive'.

[149] [Caplan and Sanson 2011], p. 201).

to be *partly* about the past and partly about the present, and so partly, but not wholly, hypothetical" (p. 205, fn. 41). I assume the thought is that God's memory is partly about the present insofar as it is a *memory* of the past (and so concerns God's present intrinsic nature), but partly about the past insofar as it is a memory *of the past*. Rhoda himself emphasizes the former (noting, for example, how God's memories could inform "his ongoing providential dealings with creation" ([Rhoda 2009], p. 54)), but it's the latter which bothers Caplan and Sanson.

There is not, or at least need not, be any problem here. To see this, consider that many humans have memories (not just apparent memories) of the past, and yet there is *no* violation of the hypotheticality constraint. This is because human memory is not fundamental – more exactly, properties which humans possess and are of the form *remembering that P* are not fundamental – and because, as previously discussed, only fundamentally past-directed properties are problematic. The way to deal with Caplan and Sanson's worry, then, is to see God's memory as similarly nonfundamental. In this spirit, although Rhoda does not say enough to determine whether he'd be happy with it, I offer the following on Rhoda's behalf. There is a class of fundamental intrinsic properties, some of which God possesses at any given time (but none of which are fundamentally past-directed); when God possesses such a property, let's say he has a certain *quasi-memory*.[150] In addition, there is some sort of immutable process by which God's quasi-memories are systematic information-preserving effects of the past; call this *the QM process*. In that case, for example, that the QM process exists and that God has a certain quasi-memory (which we might as well call the *quasi-memory that dinosaurs once existed*) together explain that <Dinosaurs once existed> is true. As far as I can see, this story need not impugn God's greatness, since the QM process could itself be a feature of God, even an essential feature.

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[150] [Rhoda 2009] (p. 54), also employs the device of quasi-memory, but for a somewhat different purpose.

This story makes no posit which violates the hypotheticality constraint. God's quasi-memories don't violate it, since God couldn't have his actual present intrinsic nature without having those quasi-memories. And I don't see any reason to think the QM process violates it; the issue here parallels that for laws of nature. Although they do not explicitly say this, it seems as if Caplan and Sanson think that there is a violation of the hypotheticality constraint whenever something "points beyond" itself, and that something does that whenever it has *entailments* for matters beyond itself. But that can't be right. If it were, then nomic presentism – which only posits the ordinary present and ordinary laws of nature – would violate the hypotheticality constraint, since the ordinary present and ordinary laws of nature together have at least *some* entailments concerning the past.[151]

Theistic presentism, as I'm suggesting it be understood, is rather similar to primitive record presentism. Rhoda might none-

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[151] At least, nomic presentism would violate the constraint so understood, were it to use a robust, non-regularity conception of laws of nature, the most prominent example of which is the Arm-strong/Dretske/Tooley conception; see [Armstrong 1983], [Dretske 1977] and [Tooley 1977]. And [Sider 2001], p. 37, persuasively argues that any presentist must accept some robust, non-regularity conception. Given how robust laws of nature (or similar things, like immutable processes) are thus crucial to the entailments in question, someone might claim that it's these which violate the hypotheticality constraint. However, robust laws of nature couldn't have their intrinsic nature and make different contributions to such entailments, so they don't violate the hypotheticality constraint as I'm understanding it. Someone might doubt that anything could have such an intrinsic nature, but that's to endorse a hypotheticality constraint that's very like the Humean injunction against positing necessary connections between distinct existences. And, whatever its actual merits, the proponent of the grounding objection to presentism can't expect everyone to find it acceptable in the way that Sider thinks everyone should find his constraint acceptable. In other words, a dialectically convincing grounding objection must not assume a Humean metaphysics, and that requires putting aside the "entailment" interpretation of the hypotheticality constraint and sticking to the "intrinsic nature" interpretation of the constraint.

theless argue that there is reason to prefer the former, as it, unlike the latter, meets a further constraint. I'll call it the *informativeness constraint*, and here's how Rhoda describes it: "An account of the truthmakers for truths about the past must provide an informative characterization of how real-ity is different from what it would have been if what is true about the past had not been true" ([Rhoda 2009], p. 47).[152] Rhoda thinks that theistic presentism satisfies the constraint because it characterizes what explains past-tense truths as "representational mental states of God, specifically, his memo-ries", the latter being a significant characterization given the "anal-ogy with human memory and other recording devices" (p. 54). What about primitive record presentism? Consider trace properties. The original version of the view characterizes them as (*i*) funda-mental properties (*ii*) possessed by the world (*iii*) whose distribu-tion is caused by the past (*iv*) in accord with the law of history, and (*v*) whose distribution (together with the law of history) explains past-tense truths. Has an informative characterization in Rhoda's sense been given? One way of interpreting the constraint is as say-ing: do not take something as explaining a truth unless enough has been said about that thing to make apparent *how* it explains the truth. On this interpretation, primitive record presentism satisfies it.[153] Another way of interpreting the constraint is as saying: do not

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[152] Also see how he applies the constraint at [Rhoda 2009] (p. 54). De-spite what Rhoda suggests, this is not the hypotheticality constraint. The latter tells us not to posit fundamental monadic properties that do not concern the intrinsic nature of objects which possess them; it does not tell us that we must additionally give an informative characterization of those properties (or how their possession affects the intrinsic nature of objects). Furthermore, the informativeness constraint is not plausibly seen as an independent *metaphysical* constraint. Metaphysics does not offer up as fact: everything can be informatively characterized by humans. Finally, although Rhoda labels his constraint an 'explanatory constraint', it's also not plausibly seen as an *explanatory* constraint in the terminology of this paper. There is no fact: in order to explain a truth, something must be informatively characterizable by humans. So I think the informativeness constraint must be some distinct sort of *methodological* constraint.

[153] That is, with the exception of not carrying out the task discussed in fn. 30 re. the structure constraint (but also see fns. 34 and 45). At one point, Rhoda's constraint sounds like the structure constraint. To quote in full a

take something as explaining a truth unless you've characterized its intrinsic nature. On this interpretation, primitive record presentism violates it, but then I deny that we've been given a genuine constraint. Surely we may posit a property when we've given a description of its theoretical role (such as its causal or explanatory role), whether or not that description says anything about the property's intrinsic nature. To see this, simply observe that physics is up to its ears in posits of this sort. For one example, physics has a lot to say about the causal role of the property of having +1 electric charge (such as its role in electromagnetism and its role in CPT symmetry), but it has nothing to say about its intrinsic nature.

Furthermore, there are two reasons to prefer primitive record presentism over theistic presentism. First, the latter requires belief in God; if you don't believe in God, then theistic presentism is not available to you as an answer to the grounding objection. Of course, if theistic presentism were the *only* viable answer to the grounding objection, then there would be no problem: any reason to believe presentism would be a reason to accept theism.[154] However, primitive record presentism provides a viable alternative. Second, theistic presentism actually fails to meet the record constraint. Recall, the guiding idea behind the constraint is that *reality* carries its history along with it as time passes, which is different from saying that *God* does so.[155] In fleshing out the record con-

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sentence I only partially quote in the main text: Analogy with human memory and other recording devices makes it reasonably clear how those representational states could bear the requisite structure to reflect the past" ([Rhoda 2009], p. 54). But the idea of structure is usually absent in Rhoda's discussions of the informativeness constraint.

[154] [Rhoda 2009], p. 42: "Consequently, unless other satisfactory alternatives come into view, it seems that someone who wants to be a presentist probably ought to be a theist as well".

[155] [Rhoda 2009], p. 59: "If my argument is correct, however, then any satisfactory account will need something functionally equivalent to an error-proof, universal, reflexive recorder. Whether that be distinct from 'God' or not may turn out to be a merely semantic issue". So long as we conceive of God in the traditional way (as an agent, etc.), then it is *not* a semantic issue whether God is distinct from the "universal recorder"

straint on the basis of this idea, I claimed it requires that the reality record and the process which produces it be *sui generis* in the sense of having no "role" in reality aside from a record-keeping one. This description fails to hold of God. This may seem a flimsy basis upon which to reject a view so similar to primitive record presentism, but recall from section one the strategy of this paper: since common sense is the main motivation for presentism, look to common sense for an answer to the grounding objection. As I argued in section three, if presentism is indeed part of common sense, then common sense is committed to the record constraint, and theistic presentism simply does not satisfy it. It's certainly implausible that common sense in any way supports the idea that past-tense truths are somehow grounded in God.

10. An Objection

In section six, I claimed that certain views violate the non-arbitrariness constraint: it's arbitrary to claim that just any old things explain past-tense truths. What could be non-arbitrarily offered in such an explanation? There I made the intuitive suggestion: anything appropriately connected to the past. A more restrictive answer is: only whatever past-tense truths are *about*. This forms the basis of a stronger candidate explanatory constraint, what I will call the *relevance constraint*: what explains past-tense truths is what those truths are about.[156] To use an example from section

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posited by primitive record presentism; they are straightforwardly distinct.

[156] I take the name from [Markosian 2013], p. 138 and [Smith 1999], p. 279. Also see [Merricks 2007], pp. 28–34, who distinguishes two sense of 'about'. First, there is the intuitive sense in which ghost stories are about ghosts, even if such stories are false and there are no ghosts. Second, there is supposedly an additional sense which is involved in the relevance constraint and which is such that, if a proposition is about something, then that something exists. I'm skeptical of this second sense of 'about' – skepticism with which Merricks himself expresses some sympathy (p. 34) – at least if it's not supposed to be intimately related to the first sense. ([Merricks 2007], p. 152, does end up claiming the two senses are inti-

six, why couldn't possession of various properties by the set of prime numbers explain past-tense truths? Because, someone might claim, past-tense truths (except in rare cases) are not about the set of prime numbers. And this constraint can be used in objection to more serious versions of presentism. For example, in objection to Crisp's abstract times presentism, someone might claim that, whatever it's exactly about, a past-tense truth like <Dinosaurs once existed> is not about one abstract time bearing a fundamental relation to another.[157] Similarly, one might object that this past-tense truth is not about any sort of present record of the past, let alone a *sui generis* record of the sort posited by primitive record presentism.[158]

A presentist has two options in the face of such an objection. The first is to accept the relevance constraint as genuine, but to argue that his version of presentism meets it. This is what Ned Markosian does in attempt to defend a version of nomic presentism.[159] I have some sympathy with this move, but I want to briefly explore (though not necessarily endorse) the presentist's second option. This is to deny that the constraint is genuine, i.e., to deny that what explains past-tense truths must be what they're about.

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mately related in a certain way.) So I have in mind a relevance constraint based on the first sense. The sense in which ghost stories, even if false, are about ghosts is that it's part of their *content* that ghosts exist (i.e., that creatures with such-and-such features exist); ghost stories can have this content even if ghosts don't exist. So, one might plausibly argue – employing the relevance constraint I have in mind – that, if true, what explains the truth of such stories must involve the existence of ghosts (i.e., ghosts themselves).

[157] [Merricks 2007] (pp. 132–133) in fact gives this very objection.

[158] Putting it under the rubric of "explanation" rather than "aboutness", Caplan and Sanson ([Caplan and Sanson 2011], p. 202 and [Sanson and Caplan 2010]) give the general version of this objection to presentist views, applying it to versions of Lucretianism, the brute past presentism of [Kierland and Monton 2007] (pp. 490–497), the abstract times presentism of [Crisp 2007] (pp. 98–107), the theistic presentism of [Rhoda 2009] (pp. 53–59) and some other views.

[159] [Markosian 2013], pp. 138-9.

To begin, think of the grounding objection as concerning true past-tense sentences (or utterances) and true past-tense beliefs (or thoughts). After all, it's the truth of such things that ultimately needs explaining. Similarly, think of the relevance constraint as saying that what explains the truth of past-tense sentences and beliefs must be what those sentences and beliefs are about. Here, then, is one view which motivates denial of the relevance constraint. On the one hand, what a sentence or belief is *about* has to do with a certain kind of cognitive role involving its deployment in reasoning and imagination. (What a sentence or belief is about in this sense can be captured by saying that, in virtue of its cognitive role, it expresses a proposition with a certain content.) On the other hand, whether a sentence or belief is *true* is in part a matter of our practice of judging sentences and beliefs to be true; of particular importance is that, in this practice, we take various kinds of sentences and beliefs to be *beholden* to certain things and not others (beholden in a constitutive, not just evidential, fashion).[160] (A sentence or belief is then true also in part because of how the world is. Putting both components together: a sentence or belief is true just in case the world is the way our truth-judging practice requires for that sentence or belief.) And the upshot of these two points is that nothing in principle *requires* that this truth-judging practice mirror or in some other way relate to what sentences and beliefs are about in the sense of cognitive role (although it would be surprising if this were never *in fact* the case).[161]

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[160] Although he does not explicitly endorse the general idea of a truth-judging practice, and he is not explicitly concerned with the relevance constraint, compare the remarks of [Ludlow 1999], p. 99, about our "procedures for determining whether a past-tense proposition is true".

[161] The relevance constraint for propositions can then be denied in similar fashion. On the one hand, what a proposition is *about* is a matter of its content. ("Aboutness" is a representational notion and so perhaps shouldn't be applied to propositions independently of some relation to intentional agents. In that case, we could just say: on the one hand, a proposition has a certain content.) On the other hand, whether a proposition is *true* is also in part a matter of our practice of judging sentences and beliefs to be true. (Considered on its own, it's most natural to think that a proposition's truth consists in its content "corresponding to the world".

Let me illustrate with a view of claims about fictional entities, one which is plausible, but which I do not necessarily endorse and will serve its illustrative purpose whether or not actually true.[162] Consider the sentence 'Harry Potter wears glasses'. On the one hand, this sentence is about a person, not a book. Why is this? Because of its cognitive role, how we deploy it in reasoning and imagination. The latter provides the easiest means of illustration. When you consider what 'Harry Potter wears glasses' says, what do you visually imagine? A boy with glasses, of course, not a book. But the point is not restricted to imagination. For example, you might reason that Harry Potter probably wears glasses because of a visual impairment, most likely myopia; this is reasoning about a person, not a book. On the other hand, 'Harry Potter wears glasses' is true, not because there exists a certain boy who wears glasses, but because a particular book has a certain content. Why is this? Because our truth-judging practice takes this and similar sentences to be beholden to the contents of books. There is nothing inconsistent in this combination of claims.

I am suggesting the presentist take a parallel view of past-tense sentences and beliefs. Consider the sentence 'Dinosaurs once existed'. On the one hand, this sentence is not about the world, or abstract times, or a present record of the past, and is instead about dinosaurs. This is because of its cognitive role. When you consider what 'Dinosaurs once existed' says, you'll visually imagine dinosaurs, not any of these other things. You may also engage in reasoning; perhaps you'll reason that, once upon a time, life would

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But – at least in this sort of context – our interest in propositions is that a sentence or belief, in virtue of its cognitive role, expresses a particular proposition. So – in this sort of context – we should think of a proposition's truth as derivative of the truth of a sentence or belief which expresses it. It's for this reason that the present denial of the relevance constraint is best put directly in terms of sentences and beliefs.) And nothing in principle requires that this truth-judging practice mirror or in some other way relate to the contents of propositions (which sentences and beliefs express).

[162] For a nice sampling of views of claims about fictional entities, see the discussions and references in [Woodward 2011] and [Friend 2007].

have been more difficult for humans (given the threat posed by dinosaurs) than it is now. On the other hand, 'Dinosaurs once existed' is true, not because of the existence of dinosaurs (in any sense), but because. . . . Here's where different presentists will give different answers. But whichever answer is given, I'm suggesting the presentist can consistently defend it on the ground that it articulates that to which our truth-judging practice takes this and other past-tense sentences to be beholden.[163] I, of course, recommend that the presentist say that this practice takes them to be beholden to a *sui generis* present record of the past.

To be sure, I have offered just the barest of sketches. There are many question about the basic idea of this section. But answering them is beyond the scope of this paper.[164]

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[163] We end up with a view that is something like the following. In a loose sense, we engage in a fiction in thinking about the past. In everyday practice, our thinking about the past is as if past objects exist "somewhere" non-present, engaging in their various activities, etc. As a result, past-tense sentences are not about present matters. But, at the end of the day, we think that only present things literally exist. This crucially affects our truth-judging practice for past-tense sentences, which thus takes them to be beholden to present matters (whether present matters concerning abstract times, trace properties, or whatever).

[164] For helpful comments on an earlier draft of this paper, I'd like to thank Roberto Ciuni, Alex Jackson, Kristie Miller, Brad Monton and Giuliano Torrengo.

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Presentism and Cross-Temporal Relations

Roberto Ciuni & Giuliano Torrengo

1. Introduction

Imagine a presentist who spells out her main tenets (see chapter 1.1 of the present volume), and an eternalist who immediately asks: "So, how do you explain that I bear the relation of *being a descendant* to my late great grandfather?". Relations of this sort we shall label "cross-temporal relations" (CTR, from now on), while by "CTR-claims" we shall denote those claims that express one or more of such relations. CTR raise challenging problems for presentism. In the following we shall review the two main strategies that the presentist can endorse to withstand such a problem. The presentist may either endorse an "eliminativist" stance and claim that there are no CTR after all; or she can endorse a "reductionist" stance and argue that we can accommodate CTR within a presentist framework. We shall argue that both stances (in their many varieties) fail to work. The paper has three main sections: section 2 in which we set forth the problem, section 3 in which we criticize the eliminativist strategies, and section 4 in which we criticize the reductionist strategies.

2. Cross-temporality and the Argument from Relations

Ontic and Factive Cross-temporality

The fact that CTR are troublesome for the presentist has received a certain amount of attention in the literature. However it has rarely

been explicitly noticed that the expression 'cross-temporal relation' is ambiguous. The expression has indeed what we may call an ontic and a factive sense, respectively:

OCTR   A relation between a presently existing entity and a non-presently existing entity.

FCTR A relation that is cross-temporally exemplified by its terms.

We call the "thesis of ontic cross-temporality" (OCT) the thesis that there are cross temporal relations in the ontic sense, namely OCTR, and the "thesis of factive cross-temporality" (FCT) the thesis that there are cross-temporal relations in the factive sense, namely FCTR. Let us focus on the distinction and on the different predicaments that OCT and FCT raise for presentism, respectively. In ordinary speech, when we say that a relation R *holds* at t between $x_1,...,$ x_n, we are necessarily focusing on the time of exemplification of R – that is that moment t at which the relation holds between the terms. By contrast, when we say that $x_1,..., x_n$ *enter* the relation R, we are not constrained to focus on one time only: we can focus on many times, one for each term that enters the relation, in order to differentiate the times of exemplification of the same relation. Thus, by exploiting the more flexible "enter" vocabulary, we can spell out FCTR – the factive sense of CTR – as follows:

FCTR[*]   A relation R is cross-temporally exemplified by $x_1,..., x_n$ – *viz*. isa FCTR – if and only if each x_i enters R at a different time than some x_j.

A relation may be cross-temporal in the ontic sense without being cross-temporal in the factive sense. In other words, OCT does not entail FCT. For the sake of example, consider the sentence

(1) Jules is a descendant of his great grandfather.

The relation 'being a descendant' between Jules and his great grandfather is *not* a case of factive cross-temporality, since there is nothing wrong in claiming that *now* Jules is a descendant of his

great grandfather and that *now* his great grandfather is an ancestor of his. However such a relation fits the requirements for being a case of OCTR, since it ties a presently existing entity (Jules) and a non-presently existing one (his late ancestor). These circumstances have already been noticed by Berit Brogaard, who has also recently pointed out that it is also the case that a relation may be cross-temporal in the factive sense, but it can fail to be cross-temporal in the ontic sense. The reason is that if relations may be cross-temporally exemplified at all, two (or more) presently existing entities may enter a relation at different times. Suppose for instance that both John and Michael are still living persons. Then, (2) would express such a case.

(2) John is taller than Michael was.

In one quite natural reading, the sentence expresses a cross-temporal exemplification of the relation *being taller*: John enters the relation *being taller than* at a different time than Michael does. That is why there are *two* tenses in (2). Think of the role of tenses in the monadic case. When we say "Robert is wise" we are saying that Robert exemplifies wisdom now, and when we say "Socrates was wise" we are saying that Socrates exemplified wisdom in the past. As in the monadic case, tenses indicate the time of exemplification, in the non-monadic case tenses indicate the time at which the terms enter a relation: by claiming (2) we are saying that Michael entered the relation *being taller than* in the past, while John enters it in the present. Therefore, (2) shows that FCT does not entail OCT: although entering the relation at different times, John and Michael are presently existing objects, and (2) does not represent an instance of OCT – at least if evaluated when both John and Michael are still alive.

Past Facts in the Weak Sense and in the Strong Sense

On the semantic level, presentism inspires two restrictions on language, which we call Quantificational Principle and Existence Entailment Principle, respectively:

QP The presentist quantifiers range on the domain of what presently exists.

EEP If $R(t_1, t_2,..., t_n)$ is *presently* true, then the referents of $t_1, t_2,..., t_n$ exist.

(Where *R* is a meta-linguistic variable for predicates, and $t_1, t_2,..., t_n$ are metalinguistic variables for singular terms). To the presentist, "presently existing" entails "existing *simpliciter*" and vice versa: nothing exists that does not exist presently and nothing exist presently without also existing *simpliciter*.[165] Hence, the so-called "presentist quantifiers" – the ones proposed in QP – are just unrestricted quantifiers to the presentist. In addition, EEP tells us that only present objects can enter a relation according to the presentist. In other words, the presentist does not conceive QP and EEP as restrictions, but simply as the expression of the only viable perspective on existence and involvements in relations.

The problems OCT brings to presentism are then easy to see. Indeed, if there are relations between presently existing entities and entities that do not presently exist (and hence do not exist *simpliciter* according to presentism), such relations should not entail the existence of their terms, but that would explicitly contradict EEP. It is perhaps plausible to maintain that certain kinds of relations, for instance "intentional" relations such as *desiring* or *seeking*, do not entail the existence of their terms, but it is much harder to defend the idea with respect to relations such as causation and perception. Thus, once we accept some *existence entailment principle* for non-intentional relations (such as EEP), OCT becomes a predicament for the presentist. It is important to notice that the problem connected with OCT lies in the restrictions imposed on ontology by presentism, and not in the fact that the terms enter the relation at different times. We can distinguish the problem raised by ontic cross-temporality from those connected to factive cross-temporality as follows: there are two theses that lie at the ground of

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[165] See [Torrengo 2012].

the intuitions supporting presentism.[166] The thesis of *ontic presentism*, which concerns the domain of quantification:

(OP) There are (quantifying unrestrictedly; i.e. there exist *simpliciter*) only presently existing entities

And the thesis of *factive presentism*, which concerns the composition of reality:

(FP) Only the facts that hold at the present time compose reality

Basically, OP is the philosophical concept behind QP, the conceptual thesis which motivates the "restriction" above. It is evident that OP – together with EEP or some analogous existence entailment principle for relations – implies that there are no cross-temporal relations in the ontic sense (OCTR), and thus is incompatible with OCT. No wonder then that OCTR are problematic *if* OP is assumed (or, in turn, if QP and EEP are assumed). By contrast, FCTR are problematic *if* FP is assumed:[167] indeed, when FCTR are exemplified, we can have the exemplification of something which is *partially* present and *partially* past (see comment to (2) above). If the pastity implicitly included in FCTR refers to facts that no longer hold, then FCTR are at odd with FP: the former would give expression to something that does not compose reality, and hence is not presentist-friendly (at least in the sense of FP). In addition, it must be noticed that FP really says something different than OP, as it is clear by the fact that there are cases that fulfil OP but not FP. For instance, take the sentence "There are two individuals x and y such that yesterday x and y were talking together". The sentence is satisfied by many pairs of presently existing persons – thus not contradicting OP – *and* respects EEP. However, its conformity with FP depends on whether facts of the form "— was talking to —" are presently holding or not: if they are taken not to hold presently, then the sentence will not fulfil FP. At the same

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[166] See [Fine 2005], pp. 298–299.
[167] Remember that OCT does not imply FCT. As a consequence, the problematic nature of OCT does not necessarily transmit to FCT.

time, if we took *all* the facts of the form "— was talking to —" as presently holding, then we would have cases that respects FP but not OP.[168] Thus, OP and FP are mutually independent – exactly as for OCT and FCT. Needless to say, the presentist will try to forge a view that includes both OP and FP, and yet neither principle is *per se* in a relation of logical consequence with the other.

Something more is worth saying on FCT. The principle takes cross-temporal exemplification as just a "particular" form of past exemplification – one that is only "partially" past. The fact that there are prima facie true statements about exemplification of properties and relations in the past (both by objects that do not exist now and by presently existing objects) is a general problem for the presentist, known as the grounding problem (see chapter 2.3 of the present volume). Now, what is the connection between the problem raised by FCT and the grounding problem? To put it roughly, the problem raised by FCT is nothing but a (particular) case of the grounding problem: *true* CTR-claims seem to presuppose truth-makers conferring ontological dignity to entities which are troublesome for the presentist. So the fate of any presentist attempt to deal with cross-temporality is linked to the success the presentist gets in facing the grounding problem. However, the problem raised by OCT is independent from the problem raised by FCT and the grounding problem. For the sake of clarity, in the present paper we shall apply the following methodological strategy: we shall assume that the presentist can solve the grounding problem by accepting *past facts* as grounds for presently true past-tensed claims. Those facts are "past" in a sense that is acceptable for the presentist. We distinguish two kinds of past facts.

(SPF) Past facts in the *strong sense*, are facts constituted by present-tensed properties or relations *that obtained in the past*

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[168] Many of the presentist which defend the idea that facts like '— was talking to —' are presently holding will also defend a stronger claim: they will consider as presently holding also facts of the form '— ruled the Roman Empire', where explicit reference to a past object is made.

(we shall call them *strong past facts* for the sake of brevity).

Suppose now I am standing and it is afternoon, but this morning I was sitting all along: the fact *that I am sitting* is a strong past fact (now), and it has obtained this morning. We could attribute the strong past fact above the following form: [It *was* the case that I *am* sitting]. Here, the past-tensed clause "It *was* the case" clearly places the holding of the fact in some earlier moment, while the present-tensed clause "that I *am* sitting" fixes the holding of its content to the relevant earlier moment. Strong past facts are present-tensed facts in the sense that they are composed of present-tensed determinations (properties and relations) which have taken place in the past. Strong past facts are *not* acceptable for the presentist, since they are not presently holding entities, and thus they do not constitute reality according to FP.

(WPF) Past facts in the *weak sense*, are facts constituted by past-tensed properties and relations *that obtain at present* (*weak past facts*, for the sake of brevity).

Coming back to the above example, we can build an example of a weak past fact. Indeed, the past-tensed fact (i.e. the fact composed by past-tensed determinations) *that I was sitting* obtains now, and is a weak past fact. Contrary to strong past facts, weak past facts are composed of past-tensed determinations which are conceived as holding *now*. The logical form of the weak past fact above could be: [It *is* the case that I *was* sitting]: the present tense in the first clause says that the fact is presently holding, while the second clause says that the temporal aspectuality of its content is pastity. Since weak past facts are facts that presently hold, accepting them does not clash with FP, and since we have granted that the presentist can solve the grounding problem, it follows that the acceptance of weak past facts is also (somehow) compatible with the ontic side of presentism OP.[169]

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[169] In a sense, "weak past fact" here is merely a label for whatever ground the presentist adopts to solve the grounding problem. More precisely, the

The Argument from Relations

Now, in which sense can cross-temporal exemplification be seen as a "particular" form of past exemplification? As weak past facts can contain past-tensed (properties and) relations that are exemplified at present, *cross-temporally tensed relations* can be past-tensed "on the one side" and present-tensed "on the other side" (for the sake of simplicity, we are limiting ourselves to the dyadic case). Sentence (2) is helpful here: the relation of *being taller than* is present-tensed on the left side and past-tensed on the right side. Exemplification of such relations obtains at present: it is now that John enters the present-tensed side of the relation and it is now that Michael enters its past-tensed side. Thus, they can constitute "cross-temporally tensed facts" in the weak sense. Such facts are as acceptable to the presentist as any "ordinary" example of a weak past fact. We take for granted, then, that the presentist can solve the factive problem of cross-temporality by extending somehow her strategy for the grounding problem and admitting cross-temporally tensed facts in the weak sense.[170]

Yet, the ontic problem is still with us. Indeed, once we grant that true claims concerning FCTR are grounded, and that certain FCTR are also OCTR, the following argument seems irresistible:

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characterisation of weak past facts that we have provided is a "second order" constraint on what are weak past facts, and it is compatible with many types of past facts, according to the adopted solution of the grounding problem.

[170] Note that cross-temporally tensed facts, although acceptable for the presentist as past-tensed facts are, they are not *reducible* to those – as the seminal [Brogaard 2006] has made clear. Besides, since our focus here is the prsentist ontology, for the sake of the argument we are granting that a solution to the grouding problem would generalize to the problem of factive cross-temporality. Yet this generalization is no trivial matter, as it is argued at length in [Torrengo 2010].

The Argument from Relation (AR)

(i) Certain presently existent objects bear a relation R to objects that do not exist any more; that is, OCT is true

(ii) If *x* bears *R* to *y*, then both *x* and *y* exist simpliciter

(iii) (At least certain) things that do not exist any more do exist simpliciter

To the presentist, (ii) is nothing but a variant of EEP. Needless to say, (iii) entails that OP is not true, and thus it is incompatible with presentism. How should the presentist react to AR? In the first place, notice that the fact that the presentist can explain what makes true CTR-claims true (or so we have granted) does not stop the *inference* from (i) and (ii) to (iii). The inferential pattern looks sound. Therefore, the presentist is left with either denying (i) or (ii), or claiming that there is an equivocation. In what follows, we consider in turn the options that the presentist has for withstanding the problem raised by the argument from relations – the AR-problem for short.

Eliminativism and Reductionism

Eliminativist positions deny (i): to them, the world contains CTR in no sense. Roughly, eliminativists deny that there *really* are any CTR,[171] appearance notwithstanding. Here we are focused on the metaphysical side of the issue, and thus we have chosen the label "eliminativist" also for those philosophers who deny (i) but do not deny that there are true CTR-claims. Of course, an eliminativist who is not ready to embrace a pervasive error theory with respect to CTR-claims is committed to a radical "hermeneutic" manoeuvre on ordinary (and scientific) language. But even accepting the ma-noeuvre or "circumventing" this semantic issue (we shall soon see

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[171] More precisely, they deny that there really are OCTR. From now on, unless we specify it (or the context is clear enough), CTR will stand for OCTR.

how), there are further problems for eliminativism. In section 3 we shall consider the main ways of shaping an eliminativist strategy and we shall argue that none of the different ways in which eliminativism can be pursed is convincing.

Reductionists accept that there are CTR in some sense and that CTR-claims may be true, but they argue that facts about CTR are compatible with presentism. In order to do so, they usually follow one of two strategies: (A) they deny (ii); (B) they deny that reading of (i) that brings troubles in and construe the tenet in such a way that – when combined with (ii) – it does not entail (iii). The first strategy is tantamount to dropping EEP, the second strategy is tantamount to claiming that there is an equivocation on "existence" between (i) and (ii). Now, whether reductionism is a tenable position or it is just eliminativism in disguise (which, *per se*, is not necessarily a drawback) depends on how the reductionist construes his or her reduction of CTR to elements of reality that are compatible with presentism. In general, presentists can expand their preferred solution of the grounding problems to the AR-problem.

In other words, the presentist will aim at construing the weak past facts that ground true CTR-claims in a way that either elicits a non-problematic construal of (i) or motivates a denial of (ii). That allows the presentist to argue that reality is both how she says and such that there are relations between presently existing objects and objects that existed but no longer do – that is she can argue that there are not only FCTR, but also OCTR. It is important to notice that given that reductionism is not *straightforwardly* wrong, ontic presentism and ontic crosstemporality are not *straightforwardly* incompatible, i.e. *the central tenets of presentism alone are not in contradiction with* OCT. That means that the presentist cannot exploit AR to argue "modus tollens" against CTR, by claiming: "since we have independent reasons to think that presentism is true, and presentism and CTR are incompatible, so much the worst for CTR". This is due to the fact that not every version of presentism is incompatible with OCT. However, as we shall argue, every version of presentism that is compatible with OCT is not worth its price.

The link between the grounding problem and the AR-problem is that the presentist can extend to the AR-problem the solution that she has applied to the grounding problem.[172] In section 4 below we shall present the main reductionist strategies and argue that even granting a solution to the problem of grounding, the "extensions" will bring predicaments in. Hence, ontic presentism and ontic crosstemporality are eventually "indirectly" incompatible, in the sense that in order to account for CTR, the presentists have to "do some extra work" (and to pay some extra theoretical cost), which will get them into trouble.

Finally, we wish to stress that none of the positions we shall discuss is a straw man, and yet most of them are incompatible with most of the others. On the one hand, there is no agreement among the presentists on what is *the* solution to the problem of CTR, but on the other hand it is pretty clear (and not only to eternalists) why AR is a problem for presentism. Dialectically, this seems to play into the hand of eternalism

3. Eternalism vs. Eliminativism

The Internalist Strategy

The eliminativist claims that reality does not contain relations between present objects and past ones, and that CTR-claims are either all untrue or they have to be construed as expressing something very different from what it seems at first sight. What in the presentist world, then, plays the role that CTR play, according to

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[172] Of course there is no need that a presentist that embraces a certain solution X of the grounding problem also will embrace an expansion of X as a solution to the AR-problem. We are only claiming that any solution proposed by the reductionist can be seen as an "extension" of some solutions to the grounding problem. This follows from the higher-level characterisation of weak past facts as a means to solve the grounding problem, assuming that the class of past facts can be enlarged to encompass crosstemporal facts too.

an eternalist ontology? In certain cases the answer is very easily given. Consider a cross-temporal comparison, such as

(3) I am taller than my great grandfather was.

(3) can be construed as a claim about a relation between two abstract entities, i.e. my height and my great grandfather's height. Insofar as the presentism *per se* has no quarrel with abstracta, such a relation is compatible with its main tenets.

However, can we extend the strategy to non-comparative relations? Focus on *internal* relations: roughly, relations that can be reduced to properties instantiated by the "relata" (at possibly different times). *Resembling*, *having a certain property to a lesser or higher degree*, for instance, are internal relations in that sense. Every internal CTR can be reduced to the present instantiation of a property by one of the alleged relatum, the instantiation of a property of the other alleged relatum in the past, and a relation between two abstract entities relevantly related to the properties instantiated at different times by the "relata". In so doing, the presentist eliminates any trace of cross-temporality from reality: nothing in the present stands in a relation with something in the past. The *relation* is between abstract entities. For instance, I can resemble someone that existed three centuries ago simply by having certain figural properties that bear similarity to the figural properties that someone *had*. If we grant the presentist a solution to the grounding problem, no problem really arises here.

However, CTR are not always internal: in particular, it is hard to see how *causation* or *perceptual relations* can be reducible to the properties of their alleged relata, while it is easy to see how they can hold between present and past entities. For such *external* relation, comparison cannot be taken as a model, and thus the "internalist" strategy is at best a partial one.[173]

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[173] See [van Inwagen 2000], and the critiques in [Davidson 2003].

The Overlapping Strategy

Presentists may try to eliminate all CTR, even the external ones, by claiming that there is always a "chain" of non-cross-temporal relations between the entities that the eternalist considers to be the *relata* of CTR. In order for this solution to go, we need a chain of relations that must be presentist-friendly *and* long enough to connect the two relata in the relevant times. Yet, how could we be warranted that there are in every case enough presentist-acceptable relations to form such a chain? Well, once again the presentist may have recourse to *abstract entities*: they abound and – since they never fail to exist – they exist in the present time (if they exist at least once in time). If presentists accept such entities, they should not be afraid that there are "missing rings" between any two entities, no matter how distant in time.[174]

However, the main problem with this solution is that in many cases it does not seem plausible that a chain of non-cross-temporal relations can "play the role" of a CTR. The presentist must comply with certain explanatory standards in providing grounds for past-tensed propositions, even though a solution to the grounding problem is granted. Let us suppose that the presentist endorses the so-called "Lucretian solution" to the grounding problem: past-tensed properties are presently exemplified by the (present state of the actual) world.[175] Thus, a sentence such as (4)

(4) Dinosaurs roamed the Earth

is made true by the present state of the world being *such that*
dinosaurs roamed the Earth. The explanatory standards with which the Lucretian solution complies can be expressed as follows:
(ES) Given a proposition *p* saying that things were in a certain
way, in order for *p* to be true, the (present state of the)

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[174] See [Chisholm 1990a] and [Chisholm 1990b], and [De Clercq 2006].
[175] In section 4 we shall see such a view as a variant of what we call "Stoic Presentism".

world t^* – or at least one object in it – must instantiate a property P which 'is about' the same thing as p.[176]

The notion of aboutness involved above has clearly a loose, intuitive sense. It can be explained away by saying that a property P and a proposition p are *about the same thing* if and only if, were eternalism true, P could be analysed (*viz.* defined through abstractions operators) in terms of the object(s) and the property that ground p. For instance, assuming that the eternalist explanation of the truth of (4) entails

(4′) There are things that at a previous time were Dinosaurs and roamed the Earth

the presentist has an account of the truth of (4) which is explanatorily sufficient if the property that grounds the truth of (4) could be analysed along the lines of (4′), were eternalism true. The Lucretian property of *being such that Dinosaurs roamed the Earth* complies with those standards. Now, ES sounds reasonable independently of the endorsement of a Lucretian solution: if I want to give a presentist explanation of what makes (4) true, my explanation is expected to somehow talk about "that portion of reality" that (4) talks about. If my explanation fails in doing this and talks about something else, well, it was actually no explanation at all.

Now, let us come back to the proponent of the overlapping strategy. How can she attempt a solution of the CTR problem? Briefly, she grounds the truth of (4) in a series of relations "connecting" the dinosaurs and (some objects in) the present state of the world. If the presentist grants the atemporal or eternal existence of abstract entities, there will always be objects for doing the job. And

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[176] ES may be seen as a special case of a more general explanatory standard (call it GES), which would state that "Given a proposition p saying that things were in a certain way, in order for p to be true, it has to be a fact that in the present state of the world one or more things exemplify a property, and such a fact has to be explanatory suffcient for the truth of p".

here the problem arises. For one of the explanatory strategies which overlapping admits is that – for instance – in the past the dinosaurs were related to the property of *being blue* and that that property is now related to me. However, such a solution of the AR-problem does not comply with ES, which seems to be indispensable to solve the problem. If the abstract properties that do the work can be *any* abstract property, then there would be properties that ground past truths while not being "about" the same as the true claims are about (not even in the very weak sense of "about" we have mentioned above).[177]

The "bullet biter" solution

A "Moorean" claim is a (logically consistent) claim that can be denied only by arguing from premises that are less certain than the claim itself; in other words, only a fool would deny a Moorean claim. Tom Crisp has argued in [Crisp 2005] that no CTR-claim that entails OCT is Moorean and – as a consequence – the presentist is free to maintain the there are no CTR really, without paying at the same time a high theoretical cost. The idea is that the presentist can deny OCT by using premises that *are* more certain than OCT itself. More precisely, some of the claims that *apparently* express ontic CTR are indeed Moorean, but do not entail OCT and thus do not support eternalism. Other allegedly true CTR-claims do entail OCT and thereby support eternalism, but they are "philosophical" claims that cannot be Moorean. A philosophical claim, indeed, is one that expresses a substantial ontological position and thus it cannot simply follow from Moorean evidence. Thus, no CTR-claim is *both* Moorean *and* supporting eternalism. Therefore, a presentist can deny the problematic CTR-claims without clashing against any blatant evidence. An example of how this should work

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[177] That may sound a bit rushy: cannot the presentist finds chains of relations that are relevant for explaining the grounding of the alleged cross-temporal relation at issue? It seems that at least causal relations can be accommodated in terms of a chain of relevant causal relations. However, If the "overlapper" goes this way, then the same arguments below in section 3 will apply.

is given by (5) and (5$'$): the former may be claimed to be Moorean, the latter cannot.

(5) G.W. Bush is of the same political party as Lincoln

(5$'$) G.W. Bush bears the *same political party as* relation to Lincoln

The evidence on which we rely for believing (5) are truths about the life and opinions of Lincoln – gathered by documents and records – and truths about the life and opinions of G.W. Bush – gathered by direct experience or reliable testimony. Only a fool would deny such evidence, and at the same time the presentist can surely comply with it without threat to her metaphysical beliefs – at least if we grant that the grounding problem is solved. Thus (5) is Moorean and brings no problem to the presentist. By contrast, (5$'$) implies that Lincoln should be granted existence *simpliciter*, and thus it is incompatible with OP. However, (5$'$) cannot be said to be Moorean, since the evidence that would justify believing it cannot simply be the evidence that supports (5): that evidence *is* compatible with presentism. Thus, denying (5$'$) is an easy option for the presentist, since, insofar as the presentist does not deny (5) too, she is not denying any Moorean truths. These are, more or less, the lines along which Crisp's reasoning goes.

Now, we agree with Crisp that eternalism and presentism are two substantial ontological positions. This implies that (i) none of them is blatantly true, i.e. true in virtue of Moorean evidence *alone*, and (ii) it may be that empirical evidence cannot settle the question between them. Yet, not all Moorean CTR-claims are as presentist-friendly as (5). For instance (6), which Crisp too considers Moorean, seems to imply something like OCT.

(6) Past events cause present events (as their effects)

Crisp argues that the presentist can deny that (6) entails OCT by adopting one among the many presentist-friendly accounts of causation. The reductive accounts, which take the causal relation to

be definable in non-causal terms, are compatible with the denial of OCT, and so are certain non-reductive accounts. Roughly, according to such accounts, the causal relation is expressed by a sentential connection between a claim about the past and a claim about the present. Thus, there is no need to take true causal claims to imply OCT.[178]

Let us assume, then, that the presentist can successfully carry about her preferred eliminativist account of the cross-temporality of causal relations, and consider instead a perceptual report such as the following:

(7) Vikash sees the star

Claims of this sort are Moorean. The evidence on which we rely to believe (7) is the behaviour of Vikash and the existence of the entity that he is perceiving. Let us take the "object of perception" in this case to be an explosion somewhere very far away in the sky. Scientific knowledge tells us that the causal relation between the object of perception and the perceiver *cannot* be a relation between two simultaneous events. The presentist may insist that the truth of (7) is grounded in a causal "chain" of events – pairwise simultaneous – that goes from the explosion of the star to the stimulation of Vikash's retina. That is ok since we have granted to the presentist an account of causation.

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[178] Reductive account of causation encompasses the "humean" and the counterfactual (see [Lewis 1973]). Non-reductive accounts take the causal relation as an external and genuine relation between two individual entities (two events, typically). A presentist versions is the "causal chain" proposal: causation "propagates" through chains of simultaneous relation between entities that coexist pairwise (see section 3). [Crisp 2005] refers also to Bigelow's account of causation in terms of relation between propositions (and probably one could adapt the eternalist account of causation in [Mellor 1998] as a relation between facts in presentist terms too; see also [Sider 1999]). We shall consider Bigelow's proposal later in the reductionist solutions. Besides, in this paper, we are not considering the further problems that Special Relativity brings in (see chapter 2.1 of the present volume).

However, (7) expresses a *perceptual* relation, what about it? The presentists who deny OCT put strong constraints on their account of perception. In particular, eliminativism with respect to CTR is incompatible with any *direct* theory of perception in the minimal sense, that is a theory that acknowledges relations between the perceiver and the object of perception as grounds of truths like (7) – possibly along with some causal story in the background too. Consider first the case in which we take the perceptual relation to be a relation between an event of perception in the perceiver and some perceived event. In order to be admissible to the presentist, the perceptual relation must hold between two simultaneous events. However, the perceived event occurs before the event of perception, and thus it cannot be the object of perception. And that holds not only with respect to very far objects, such as stars, but also with respect to everyday objects and events. Consider the case in which the perceptual relation is taken to hold between two enduring entities (or facts or propositions "about" them). The presentist can argue that it may be the case that very far objects have ceased to exist when we perceive them, but in ordinary cases, we perceive presently existing objects. Thus, the presentist may claim that ordinary perceptual reports are grounded in relations between the presently existing perceiver and presently existing objects of perception (or a proposition, or a fact "about" it). This account of perception is too naive to survive even a minimal scientific standard of explanation. Consider my present perception of a chair, it is not the present existence of the chair what explains my present perception of it; it is its (very recent) past existence. If the chair were to come out of existence now, I will still perceive it if existed few milliseconds ago. The reverse goes for the perceiver. It is not my very recent past existence (only) what explains my perceiving the chair, it is my present existence. The conclusion is that the eliminativist of cross-temporality is compelled to an indirect theory of perception.[179]

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[179] "Mixed" accounts in which we take the perceiver to be a enduring entity (or a proposition/fact) and the object of perception to be an event (or the other way around) undergo analogous critiques. Note that the

Maybe this is not too bad a consequence for the presentist. We want to have a direct theory of perception (in the minimal sense above) only if we care to respect our intuitions that perceptual relations between us and the objects of perceptions are part of the world. The eternalist has a straightforward account of that intuition, and that account complies with our scientific knowledge of the limit of velocity of propagation of information. We do not want to claim that denying such intuitions is tantamount to denying any Moorean claim (although it is not implausible to claim that intuitions about our being directly related to objects outside us rely on Moorean evidence). Yet if the presentist maintains that such intuitions led us astray, she has to add some bits to her error-theoretic story. Thus, her position must develop into something that does this job. The quasi-truth strategy goes a little further in that direction. As we shall see, the criticism against this further strategy indirectly applies to the "biting the bullet" solution. Indeed, the "biting the bullet" solution needs "quasi-truth strategy"to be feasible. Thus, if the latter does not go, the former will not either.

Going Quasi-Truth

Let us assume that the eliminativist with respect to CTR has a convincing story and she can argue that the world is in a certain presentist-friendly way every time we talk and think as the world contained CTR – and that OCT were true. If a presentist wants to escape the Scylla of negating the truth of any problematic CTR-claim, then she will face the Charybdis of a massive "hermeneutic" manoeuvre. The bulk of the manoeuvre can be undertaken in the following two steps: (i) take the claims that both are true *and* entail OCT; (ii) re-construe them as if they had a deep logical form that

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presentist who denies OCT is compelled to endorse *not* only some internalist account of mental states, but some sort of sense data theory of perception, where the proposed object of perception is actually a "surrogate" of what science and common sense suggest us to take as object of perception ([Torrengo 2008], p. 145).

allows us to explain how they can be true in a presentist world.[180]
The key notion in this strategy is that of "logical form". Now, at-
tributing deep logical forms to sentences that widely differ from
their grammatical structure is a tricky issue. It is tantamount to
providing non trivial meaning-preserving paraphrases; but – alas! –
it is hard to find agreement on what aspect of meaning is relevant
for preservation, and on whether the intended aspect has been pre-
served in the paraphrase.

The quasi-truth strategy is a way to "circumvent" the impasse,
by means of a convincing error theory. The presentist may note
that people in ordinary talk quantify over every sort of thing, inde-
pendent of their ontological beliefs (if any). All in all, presentists
also do this: they quantify over past things and talk about relations
be-tween present things and past things. Ordinary evidence cannot
support the truth of such claims, since they are false, but it can
support their *quasi-truth* status. A false sentence is quasi-true when
there is a quasi-supervenience basis that "underlies" it. In the case
at issue, a quasi-supervenience basis for *p* is a set of truths that
would entail *p* were eternalism true. Since the difference between
quasi-truth and truth lies only in a substantial metaphysical theory
– eternalism – the notion of quasi-truth is a way to spell out the
idea that CRT-claims are always false, but when they seem to be
supported by ordinary evidence, then we can think to them as true
"philosophical niceties aside". Internal CTR are easily accounted
for in quasi-truth terms, since a presentistcompatible account of the
properties possessed by the alleged *relata* at different times would
suffice as a quasi-superveninent basis for all internal relations,
either cross-temporal ones or not. Were eternalism true, past things
would have properties: those are the basis for the truth of all inter-
nal relations between past objects and any other object, present or

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[180] See [Sider 1999], and [Markosian 2004], who discuss two slightly
different versions of the strategy. For a criticism of the strategy from a
presentist point of view, see [Crisp 2005], pp. 9–10. Note that the presen-
tist could also claim that (7) and other CTR claims have the logical form
they wear on their sleeves but they are *made true* by presentism-
compatible facts. We shall consider that case among the reductionist pro-
posals.

past. For external relations the situation is more complicated, but they can be claimed to "supervene (globally) on the totality of facts about i) where and when intrinsic properties are instantiated, and ii) nomological matters, including causal relations and laws of nature." ([Sider 1999], p. 12). If the presentist finds a quasi-supervenience basis for nomological and spatiotemporal facts, then she will solve the problem of eliminating all external cross-temporal relations (among others), while warranting the quasi-truth of all claims that entail OCT.

There is a number of problems with the quasi-truth strategy. Here we wish to focus on the following: through a general eliminativist strategy, such as that of the quasisupervenience basis, the presentist eliminates ontic CTR by eliminating the *relations themselves* from her metaphysics. Granting that relations between spatio-temporal locations can be treated in terms of conjunctions of tensed non-relational facts,[181] a quasi-supervenience basis for nomological facts would contain only atemporal relations between abstract entities, such as those employed in the formulation of general laws of nature. This means that the eliminativist with respect to CTR will eliminate virtually all genuine and "concrete" relational facts. Not surprisingly, a metaphysics that basically does not contain any relations at all is not concerned with the problem of cross-temporal *relations*! We conclude that in so far as doing away with all relational facts is not in one's grand metaphysical view, the price of solving the AR-problem through the quasi-truth strategy is too high.

4. Eternalism vs. Reductionism

As we have seen, all eliminativist strategies deny OCT (i.e. premise (i) of the Argument from Relations) at expenses that are not worth paying. In addition, such strategies seem to have a *limit of*

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[181] See [Bourne 2006] and [Crisp 2007]. [Sider 1999] notes that reduction of spatiotemporal relations without adhering to absolutist view of space-time is a challenge (we are setting aside this further problem).

scope: on the one hand, the attempt at eliminating OCT from our conceptual apparatus works just in a limited number of cases, on the other hand, we cannot go with the idea that cross-temporal relations never stand for Moorean facts, since some OCT do not, but some others do instead. We have also granted that the presentist can provide grounds for truths about the past, and also that she can accept OP. However the general grounding problem for past-tensed truths, the more specific problem of **OCTR**, and the AR-problem are *distinct* problems and even when granting that the first two are solved, the presentist will need some further work to solve the latter. If a presentist accepts that she must live with cross-temporal relations, then, she needs anyway to dismantle the Argument from Relation: the acceptance of OCT does not *per se* save her from the threaten of the AR-problem. The question arises as to how the presentist can give an account of cross-temporal rela-tions that does not conflict with her basic tenets. In the present section we discuss indeed the reductionist strategies, i.e. the approaches according to which the proper reading of OCT is compatible with presentism, and hence the Argument from Relations does not take off the ground. Such strategies divide into four great families: the ones that see past-tensed facts as a legitimate constituent of reality (views which we label Stoic Presentism and Primitivism), the ones which 'trade the non-eternal for the eternal' (Haecceitist Presentism and Meinongian Presentism), the ones which simply deny **EEP** (Deflationism) and the ones which 'reduce' any kind past entities to the traces they have left to the present.

Full-fledged Reductionism

Full-fledged reductionists, as we shall label them, argue that truths about the past in general can be grounded in certain ordinary facts about the present world. According to [Ludlow 1999], such facts are the "traces" (in a very broad sense) that the past has left (see chapter 2.4 of the present volume). Footprints, fossils, documents, memories and all other traces are ordinary and unproblematic (for both the presentist and the eternalist) constituents of the present word, which ground true past-tensed sentences.

The problems with such an account become clear when one spells out the connection between a trace and the past fact of which it is a trace. Indeed, the usual explanation given by the presentist involves a *causal link* between the past fact and the entity which presently is its trace (or one of its traces): past facts or events have caused present traces, and this would allow the latter to ground truths about the past. Thus, the trace account rests on the cross-temporal relation *par excellance*, namely the cause-effect relation. Obviously, the presentist can try to make such a relation admissible to her, but then the "trace" solution of the AR-problem will rest on the feasibility of a presentist account of cross-temporal causal relations, and the principal argument against such an account is precisely the Argument from Relations. The proposed solution is then circular.

The presentist can drop (singular) causal relations between present events and past ones, and saying that all is needed for grounding past truths are present facts together with the laws of nature, which are explanatory means at the presentist's disposal.[182] For example, if the present state of the world includes a given electron e and certain values of activity at place $l1$ (call it Situation A), the laws of physics tell us that a beta decay has occurred and caused the existence of e.

However, such an account works smoothly only if the laws of nature are deterministic. Now, the philosophical debate on determinism and indeterminism of the laws of nature is still ongoing, and thus the presentist is free to opt for a determinist view, if she likes. If the laws of physics are deterministic, the presentist will avoid the above problem and – in addition – she would agree with the eternalist on what truths about the past and CTR are grounded. But what if the laws of nature are indeterministic? Well, the past fact that has actually let to Situation A could have failed to lead to it, and thus it would not be an adequate ground for Situation A. In

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[182] [Markosian 2013]. The crucial assumption is that the totality of present-tensed facts at any given time is suffcient to determine a unique set of laws of nature that govern the world. See also [Ludlow 1999].

general, if the laws of nature do not determine (along with the present state of the world) the present truth of a claim about the past, then we should take it as expressing an untrue proposition. This is the price that the presentist has to pay if she does not want to rule out a priori the possibility of indeterminism. Maybe, as Ned Markosian has recently argued, that is not too high a cost. On the one hand, if the laws of physics are only mildly indeterministic (as the laws of quantum mechanics seem to be), most of ordinary past tensed truths will turn out to be grounded. On the other hand, if the laws are *widely* indeterministic, then many propositions about the past we ordinarily think to be true will be undetermined (or false) – but in such weird worlds this is precisely what one should expect after all!

Whatever one may think of this answer, the trace approach seems to suffer from a deeper problem: it does not satisfy the intuition that the truth of a sentence should be grounded on something the sentence is about. Suppose God's will is the ground of everything that happens; we would still like to say that what grounds the truth of "this rose is red" is redness (or the redness of the rose) and not God's will (see [Merricks 2007]). In section 3, we have spelled out such an intuition in terms of the explanatory standard ES, which is endorsed by the presentist herself. Well, does the trace approach fit ES? It does not. For consider Situation A: what grounds it? Not the fact that a given case of beta decay has caused it, since having recourse to causality threatens the trace approach with circularity. Let us say that Situation A is grounded on "the values of activity at the present state of the world is n and the laws of nature are so-and-so". The sentence is clearly not about the existence of e, and hence the proposal does not fit ES.

Haecceities, Non-existents and the Deflationist Solution

In this section, we discuss three presentist options which deny **EEP** or propose a version of it in which the essences of the individuals – not the individuals themselves – are involved. Such options are Meinongian Presentism and Haecceitist Presentism. We then briefly take into consideration the Deflationist Strategy.

The basic idea of the haecceitist presentist is that in any tensed discourse we do not actually talk about individuals; we rather talk about their *haecceities*. The haecceity (or "thisness", or individual essence) of an individual *x* is a property that necessarily only *x* exemplifies. Since properties are eternal existents – so the Haecceitist argues – our tensed talk is committed just to entities that do not threaten presentism.[183] Thus, sentence (1) should be understood as saying "the haecceity of Jules and that of his great grandfather together coexemplify the relational property *being a descendant of* ".[184] But what is an haecceity, more precisely? According to the presentist, the haecceity of Socrates – say – is the property *being Socrates* (in the intensional version) or the singleton {Socrates} (in the extensional version). It is then clear that this solution actually presupposes the entities of which it would like to rid. Indeed, singletons presuppose their members, and identity properties presuppose their bearers. For instance, the identity of {Socrates} depends on the identity of its only member: what that singleton is depends on what Socrates is. The same for the property *being Socrates*: what it is depends on what its bearer is. Our talk about a given haecceity makes sense only if the corresponding individual is presupposed, and hence the haecceitist presentist cannot explain reality without presupposing the entities she would rid.[185]

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[183] The basic idea of haecceitism (as we are presenting it here) has been first introduced by Alving Plantinga in [Plantinga 1974] to deal with *de re* modality and solve the problem of *possibilia*. The view has been applied to the problem of non-present entities by Robert Adams in [Adams 1986]. We are here assuming that the heacceities be considered not only a semantic means to give the truth conditions of certain sentences, but they are addressed explicitly to solve the metaphysical problem of the ground of such truths.

[184] Notice that, for (1) to be true at time *t*, the presentist would say, the haecceities of Jules and his great grandfather must be exemplified, that is Jules and his great grandfather must both exist. Consequently, while sentence (1) is presently true for the eternalist, it is false for the Haecceitist presentist.

[185] This argument is developed in depth in [Fine 2005], p. 182, where the tenability of Haecceitist actu-alism is into account – that is, the haecceitist

Meinongian Presentism does not trade individuals for some proxy, but takes *being* and *existence* as two distinct, non-coextensive, notions.[186] While all objects have *being* (including the ones that existed but no longer do, and the ones that will exist but not yet does), only the objects that *exist in the present* posses *existence*. There may *be* things that either exemplify properties or enter in relations with present entities even if those things do not *exist*. By accepting past objects as non-existent objects in her ontology, the Meinongian presentist is able to ground true past claims and at the same time resist the AR-problem. However, many philosophers find the notion of non-existent objects not so easy to make sense of, and the price to pay for endorsing a Meinongian solution to the problem of CTR too costly.

Finally, the presentist may try to argue against EEP while avoiding commitment to a Meinongian ontology at the same time. As Hinchliff has pointed out (see [Hinchliff 1996]), we can distinguish two great "families of presentist theories": *serious presentism*, which accept EEP with no exception, and *deflationist presentism*, which denies any compelling force to the intuition lying behind EEP, and thus gives you presentism while dismantling the AR-problem. Against deflationist presentism some have argued that it actually entails serious presentism and thus leads to incoherence, while according to others it is unclear whether the deflationist is not actually accepting Meinongian entities.[187] we shall not pur-

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strategy to rid possibilia out of modal discourse. However, it is easy to see that the same argument applies to Haecceitist presentism.

[186] This kind of presentism can be attributed to Marie Elisabeth Reicher (see [Reicher 2010]). Note that Adams advances his haecceitist proposal only with respect to the past, with respect to relations between present and future entities he maintains an eliminativist stance: there are none. By constrast, Reicher defends a symmetry between past and future entities. See also the proposal in [Williamson 2002].

[187] See [Bergmann 1999] vs. [Hudson 1997], and also [Keller 2004]. Unrestricted or deflationist presentism is sometimes labeled "frivolous" presentism. Furthermore, if the deflationist maintains that the presentists should "relax" the commitment of their explanatory language and allow

sue these objections here, even if we take them to be serious problems for the position.

You must be Stoic, Presentist!

One of the most influential reductionist proposal has been given by John Bigelow in [Bigelow 1996]. In a nutshell, it consists in denying that cross-temporal relations hold between *individuals* and arguing that they hold between *presently existing propo-sitions*. Bigelow actually tailors his solution to cope with the cause-effect relation,[188] that is one among the many cross-temporal relations. However, Bigelow's idea has been the ground for reduction strategies for all CTR, and thus we shall feel free to present his view as a solution of the AR-problem in its generality. The solutions fathered by Bigelow are usually based on the combination of the following two tenets, which we shall label 'Stoic Presentism':[189]

1) CTR hold between presently existing propositions.

2) Propositions eternally exist.[190]

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that the truth of past tensed true propositions to be explained by past tensed talk, it becomes unclear whether this version of presentism is actually advancing a solution to the problem which is substantially distinct form the eternalist one. [Torrengo forthcoming] pursues this line of thought against the proposal by [Sanson and Caplan 2010] and [Tallant 2009a].

[188] Bigelow aims indeed at circumventing the so-called "Argument from Causation" ([Bigelow 1996], pp. 39–40), which can be seen as a special case of the Argument from Relations (that is the case where '*R*' is indeed the causal relation).

[189] The choice of such a label is due to the fact that the position proposed in [Bigelow 1996] is rooted in the notions of 'sign' introduced by the Stoics (see [Bigelow 1996], p. 43).

[190] Principle 1) is to be found in [Bigelow 1996], p. 42. Notice that Bigelow *does not* propose principle 2) in any of his works. In [Bigelow 1996], p. 42, he explicitly proposes the principle that 'a proposition exists provided that it is true'. Needless to say, the principle stated by Bigelow and principle 2) do not coincide: by following Bigelow's principle, the proposition 'Some man have landed on Jupiter' does not exist *now*, since it is

What does 1 mean? Suppose we must analyse the ontological commitment of the sentence

(8) That *wound* (on Bruce) has caused that *scar* (on Bruce)

where the given wound is already gone and what is *presently* left is the given scar. Clearly, if we think of the causal relation – a CTR – as holding between two individuals (that wound and that scar), then the trap of the Argument from Relation will be triggered, since one of the two individuals (the wound) does not exist anymore. How can a presentist resist this? According to Bigelow, we should regard sentences like (8) as being about propositions and stating a link between them. (8) for one is about the propositions "Bruce has had a wound" and "Bruce has a scar", and it states a causal link between them. If we make this explicit at the linguistic surface, we get:

(8′) *That Bruce has had a wound* has caused *that Bruce has a scar*

Needless to say, *That Bruce has had a wound* cannot help us solve the AR-problem if the proposition is not among the existents of the time where (8′) must be evaluated. Principle 2 ensures that such a situation can be triggered: *That Bruce has had a wound* exists *now*, since – as any proposition – it eternally exists. The inference characterizing the Argument of Relation does not apply. Since principle 2 holds for any possible proposition, Stoic Presentism manages in blocking the AR-problem.

Though the solution we have described presupposes *abstract entities* such as propo-sitions, the above strategy works without

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presently *false*, while it exists according to principle 1), no matter what its truth-value is. Since many presentists adopt Bigelow's strategy while endorsing principle 2), we shall propose it as a part of the Bigelow-style solution. Notice that choosing principle 2) instead of Bigelow's principle of propositions' existence will have no bearing in what follows, other than simplifying matters.

assuming propositions or any other abstract entities. Bigelow himself presents a 'concretist version' of Stoic Presentism, which we shall call 'Lucretianism'.[191] Such a view is committed only to concrete entities such as *facts* and can be resumed as follows:

*1') CTR hold between presently occurring facts.

3) A past fact never comes out of existence after it has once come to existence.

1' simply replaces propositions with facts. Under this new analysis, (8) should be rephrased as

(8") [It is the case that Bruce has had a wound] has caused [It is the case that Bruce has a scar]

where [It is the case that Bruce has had a wound] and [It is the case that Bruce has a scar] are two weak past facts. The reason why the Lucretian should formulate (8") with weak past facts rather then strong ones is clear: strong past facts are not admissible in a presentist ontology, as we have seen in section 1.2). Principle 3 replaces principle 2 in a way that sounds more adequate to facts (indeed, the idea that facts are eternal existents is less widespread than the idea that propositions are eternal existents). It states that, when dealing about past facts, we have no problem about existence. The resulting analysis is then clear: facts (weak past ones, present ones) are the real relata of CTR, and the fact that they do not always exist is no harm for the reduction strategy.

A variant of the proposal (which is actually Bigelow's final word in [Bigelow 1996]) takes properties of the whole (present state of the) world as the ground of present truths about the past and relations between such properties as the ground for causal (and generally cross-temporal) claims (see section 3). For instance, the truth of sentence (4) – 'Dinosaurs roamed the earth' – is grounded

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[191] The label is due to the explicit reference of Bigelow to the materialist theory of Lucretius [Bigelow 1996], p. 44.

in the fact that the (present state of the) world has the *time-property* 'being such that dinosaurs roamed the earth'.

Stoic Presentism presupposes the entities it wants rid of

Well, a number of objections can be cast on Bigelow's solution, both in its Stoic and Lucretian versions. First: how good is an account of *causation* (as one among many CTR) as a relation between present-tensed propositions (facts) and past-tensed propositions (facts)? Firstly, no doubt causation is an open issue in philosophy, but basically no philosopher supports the idea that causation relates *propositions*, and few support the idea that causation relates facts (a notable exception is [Mellor 1998]). Secondly: which kind of "propositions" or "facts" are the Stoics and Lucretians talking about here? We only know that some of those propositions (facts) express past-tensed facts (are past-tensed facts).[192] Let us call a conception of propositions (facts) "Objectualist" if it states that (i) the individuals mentioned in a proposition *p* (occurring in a fact *A*) are constituents of *p* (*A*); (ii) the existence of a proposition (fact) depends on the existence of all its constituents. By contrast, an "Anti-Objectualist" conception of propositions (fact) will deny either (i) or (ii), or both (the Anti-Objectualist on propositions or facts may even deny that they have any structure at all).[193] Well, given the restrictions on the presentist ontology, the

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[192] Roughly, if *p* is a present tensed proposition, the past-tensed fact *that it was the case that p* "correspond" to the (true) past tensed proposition *that it was the case that p* if and only if the world exemplifies the property of 'being such that it was the case that *p*'. Concerning the notion of correspondence, we are a bit vaugue here because how exactly one is to construe it does not really matter for our point.

[193] Two remarks are worth doing here. First, endorsing (i) while denying (ii) sounds really implausible. Second, also endorsing (ii) while denying (i) does not sound tenable: for if individuals are not constituents of propositions, we seem to lose a very reasonable ground to state that propositions cannot exists unless the individuals they mention exist. We could have other grounds for (ii), but literature has not been generous in proposing them. Thus, it looks very plausible that the Anti-Objectualist will actually deny both (i) and (ii).

propositions and facts Bigelow is talking about cannot be "Objectualist": for the proposition *this man has had a wound* exists also *now* – when the wound is gone – and so its existence does not depend on its constituents. The same can be said for the fact [This man has had a wound]. Stoic Presentists and Lucretianists then endorse an "Anti-Objectualist" view on propositions and facts, respectively. The fact that Stoic Presentism is committed to such a view revives the doubts which we have cast about its treatment of the causal relation: for we reasonably suppose that causation involves concrete entities or entities that are at least built up (also) on concrete constituents. However, neither facts or propositions may be such, if an Anti-Objecutalist position is endorsed. Under this perspective, propositions and facts are in a sense abstract entities, since they are not built on concrete constituents. However, the idea that abstract entities are the relata of causal relations proves quite unconvincing.

Things do not change if we appeal to properties: they do not look like sound candidates as relata for causation – or at least, they are widely disregarded candidates. In addition, the opposition between "Objectualism" and "Anti-Objectualism" naturally presents itself also when properties are at stake. We could define "Objectualism on Properties" by a variation of the previous principles. Since it is not clear what a constituent of a property should be,[194] we shall define 'Objectualism on Properties' just by means of an existence criterion: (i″) the existence of a property depends on the existence of some instantiators of it. 'Anti-Objectualism on Properties' is simply the negation of (i″). Well, what is a property? It is a set, many philosophers will reply. Suppose the Stoic Presentist endorses both 'Objectualism on Properties' and an extensional view on properties. Now take the time-property 'being such that that given wound has caused that given scar'. Which set is this property? Clearly, it is the set of those times where it is true that –

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[194] Some have stated, by contrast, that the idea of a constituent of a property is clear and makes good sense. See [Fine 2005], p. 188, where it is stated that the individuals instantiating a property are indeed the constituent of that property. Though we do not oppose this view in principle, we prefer to stay neutral from any view on the constituency of properties.

in the eternalist language – that given wound has caused that given scar. We may legitimately suppose that there is more than one time when this is true. Well, the Stoic Presentist is now forced to face a serious in-desideratum: being commited to the existence of a set implies being committed to the existence of its members (since the latter are indeed the instantiators of the property). But in this case, this means committing to the existence of times different from the present, that is objects that do not exist now and thus are not admissible to the presentist. By contrast, if all the moments different from the present's are negated any existence, any time-property will just be the singleton including the present time. But this would mean that all properties are the same property! Needless to say, this is far from plausible.

The Stoic Presentist, however, might want to be objectualist *and* see properties as *intensional* entities. The time-property 'being such that Jules is a descendant of his late great grandfather' is not to be explained away by the set of times which extends the property, and the argument above does not threaten anymore. However, the Stoic Presentist would then face a problem we are now familiar with: it presupposes the identity of the entities it should rid. Why? Well, the property 'being such that Jules is a descendant of his late great grandfather' clearly presupposes the identity of the given person who is the late ancestor of Jules (as well as the identity of Jules himself). Reasonably, if I include entities Xs in my ontology, I will also include any entity Ys such that the identity of the Xs depends on the identity of the Ys. If I include the singleton of Socrates in my ontology, then I must reasonably include Socrates himself: I could not make sense of the (identity of the) former, if I did not presuppose the (identity of the) latter.[195] Thus, if the ontology of the Stoic Presentist includes the intensional entity 'being such that Jules is a descendant of his late great grandfather', it will also include that given late individual.

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[195] For such a view on ontological presupposition and ontological commitment, see [Fine 2005], p. 182.

Endorsing "Anti-objectualism on Properties" seems the only way left to the Stoic Presentist. Suppose she denies (i″) and has an extensional view of propeties. Time-properties will be sets of times, but their existence will not depend on their members (by the negation of (i″) and the reduction of properties to sets). However, a given set of times reasonably presupposes the identity of its members, otherwise we could not even say what that set is. Thus, as by the argument above, we have that the antiobjectualist Stoic, when following an extensional view on property, must presuppose at least some of the entities she would like to rid, namely times which are not the present one. Suppose the Stoic Presentist goes with an intensional view instead. We have seen however that 'being such that Jules is a descendant of his late great grandfather' presupposes the identity of *that* given individual. Then, we have once again that the anti-objectualist Stoic presupposes entities that she would like to rid (that is a wound that does not presently exist, with respect to the example above). And, of course, if we substitute past entities with past-existents, uninstantiated haecceities, or other props, we fall back on some of the previous solutions and inherit their costs and problems.

Variants of Stoic Presentism and Primitivism

We shall now consider two positions that can ideally be seen as 'variants' of Stoic Presentism other than Lucretianism. The positions are what we call Presentist Ersatzism and Primitivism, and are due to Tom Crisp and Berit Brogaard, respectively.

Tom Crisp in [Crisp 2007] has provided a variant of Stoic Presentism, which aims at saving the position from a criticism which has been developed by Ted Sider in [Sider 2001]. Sider notices that if the Stoic uses propositions, facts and properties as grounds for past-tensed truths, she is "pointing beyond" what she actually accepts as real: the past has no reality whatsoever in the presentist view of things. Therefore, it is an unacceptable explanatory means by the presentists' very standard. Accepting past-tensed properties instantiated by the present world as what explains the truth of past-tensed claims is a form of cheating. The problem – Crisp replies –

is not fatal to the Stoic presentist, since the past should be analysed in 'ersatzist' terms, where earlier times ('the past') are seen as maximal and consistent sets of propositions[196] and the relation 'earlier than' is read as an "ersatz" temporal relation. Following this reading, the time-property of being such that Dinosaurs roamed the Earth – which should ground (4) – is not an unstructured element of the presentist metaphysics, and it is rather to be analysed as constituted by the present-tensed property of roaming the Earth by exploiting the machinery of "ersatz" times and temporal relations (more precisely, it is analysed as being an *x* such that the proposition that dinosaurs roam *x* is included in an earlier time). Clearly, this variant of Stoic Presentism can read CTR-claims such as (8) without having recourse to 'the past' as an irreducible entity which cannot be further explained (weak past facts, past-tensed propositions and properties). At the same time, the variant is not committed to non-existents or haecceities. The reason why Ersatzism can be seen as a variant of Stoic Presentism is clear: Ersatzism's talk of times being maximal propositions which imply either *p* or not *p* is nothing but another way to say that times have a given time-property (say, that expressed by the proposition *p*).

However, Berit Brogaard has correctly argued that Crisp's proposal cannot account for CTR if it is not radically modified. Indeed, none of the ordinary present-tensed properties and relations can do the job envisaged by Crisp. Consider, again

(3) Jules is taller than his great grandfather was

the natural thought is that the relation expressed by (3) should be analysed in terms of the relation *being taller than* and the earlier relation. This is also – easy to see – the main guideline in Crisp's solution. However, such a thought is not right. It builds on the claim that the proposition that Jules bears the *taller than* relation to

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[196] Alternatively, each past time can be seen as a maximal consistent proposition, that is a proposition *Q* such that, for every proposition *p*, etiher *Q* implies *p* or implies not *p*. For this option, see [Prior and Fine 1977].

his great-grandfather is included in some earlier time. However, at no time do Jules and his great-grandfather both exist and stand in that relation. Brogaard then argues that what we need here in order to have a ground for CTR is *cross-temporally tensed relations*, namely tensed relations that can be differently tensed in each of their "sides". The relation expressed by (3), thus, is

(**TR**) $\lambda x \lambda y[x$ is taller than y was$](j, g)$

where j stands for Jules and g for his great-grandfather, and λ is an abstraction operator. The ground for (3) is the fact that Jules bears **TR** to his great-grandfather. **TR** is in turn a primitively tensed relation and cannot be further analysed by means of the present-tensed relation being taller than and other devices such as tense operators or the ersatz times machinery.[197] Such a position we shall call "Primitivism". More than a variant of Stoic Presentism, Primitivism can be a useful supplement to it: one can have the general view of the past as a property of the present, and at the same time view CTR as irreducible tensed relations – that is, as a kind of particular properties of the present, for instance that of "being such that Jules is taller than his great grandfather was".

Notice that Brogaard's Primitivism does not encounter a problem which is shared by many of the reductionist strategies we have seen, such as Full-fledged Reductionism and Haecceitist Presentism. According to such strategies, truths about any presently existing entity a are not grounded on a, but rather on something else: $\{a\}$ or 'being a' for the haecceitist presentist, some trace of a for the full-fledged reductionist. However, this conflicts with the minimal requirement of explanatory standard expressed by ES. By resuming this with a slogan: if the presentist grounds a truth about a past entity in the present alone, she seems to violate a "relevance con-

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[197] As [Brogaard 2006] stresses "tensed binary relations are not reducible to tenseless binary relations and tensed existence claims" (p. 197). Hence, **TR** is indeed a *primitively tensed relation*, whose cross-temporality is not reducible to tensed attributions plus tenseless relations. For a different critics of Brogaard solution to the ontic problem of cross-temporality, see [Torrengo 2006].

straint" on truth-explanations.[198] Brogaard's proposal is free from the problem. Indeed, Primitivism grounds CTR-claims about – say – Jules and his ancestor in the holding of a cross-temporally tensed fact occurring to them, thus respecting ES. At the same time, it denies that such facts imply the existence of Jules' ancestor, thus following Anti-Objectualism on Facts for (cross-temporally tensed) facts.

Going beyond this issue, Brogaard's Primitivism also denies that there are tense-less cross-temporal relations, and thus combines eliminativism with respect to tense-less CTR, such as (1) or (5), with reductionism with respect to tensed ones, for which she argues that the principle of relations does not hold. In a nutshell, Primitivism extends the repertoire of relations at the presentists' disposal and solves the problems with CTR too, indeed by adding primitive cross-temporal relations such as **TR**. Such a position seems then to allow a reductionist truth-explanation that sounds as satisfac-tory as the explanation of the eternalist. Primitivism gives rise to serious problems, though. Needless to say, endorsing Anti-Objectualism on Facts leads to the same objection regarding causation which we have displayed for Stoic Presentism (see section 4): cases of causation should be taken to hold between entities which are concrete or at least built up (also) on concrete constituents. This requirement cannot be fit by any view that is conjugated with Anti-Objectualism on Facts. In addition, Primitivism falls once again in the objection presented by Sider: since relations like the one expressed in **TR** cannot be explained in terms of the present, they are pointing beyond reality, or better, beyond the reality the presentist may admit.

However, the most relevant objection to the primitivist is that she has no way to express what distinguishes her view on the ground of (3) from the eternalist's view on what grounds the same sentence. As a consequence, Primitivism is targeted by the criticism of the sceptic, who insists that presentism and eternalism are

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[198] For analogous principles, see [Merricks 2007], and also [Tallant 2009b] and [Sanson and Caplan 2010].

just verbal variants. In order to understand why, we must come back to the distinction between strong past facts and weak past facts. Take (9), and suppose the presentist and the eternalist agree on its truth:

(9) Socrates was wise

We can read (9) as expressing the strong past fact [It *was* the case that Socrates *is* wise], where the present-tensed fact [Socrates is wise] is taken to hold at some past time. At the same time, (9) can be read as expressing the weak past fact [It *is* the case that Socrates *was* wise], where the past-tensed fact 'Socrates was wise' is taken to hold now. Remember that, while the eternalist may accept both kinds of past facts, the presentist *cannot* accept strong past facts, in accordance with FP (see section 2). It is a crucial difference between the two positions that they *disagree* on what makes (9) true. The eternalist will be free of choosing [It *was* the case that Socrates *is* wise], or [It *is* the case that Socrates was wise], since she will reduce the latter to the former. By contrast, the presentist will take the weak past fact [It *is* the case that Socrates *was* wise] to be the ground of (9)'s truth, since she cannot opt for a strong past fact. By converting our fact-talk into property-talk, we may say that the crucial difference between the presentist's grounding of (9) and the eternalist's one is that for the former, the property *having been wise* is *now* exemplified by Socrates, while for the latter, the property *being wise* has *previously* been exemplified by Socrates. Well, suppose we ask the presentist to explain the difference between her view of the ground of (9)'s truth and the view of the eternalist. She can display a number of ways to explain what grounds (9)'s truth. In any case, the core of such a number of ways can be explicated by the presentist with the sentence: "To me, (9) is grounded in the fact that a past-tensed property is now exemplified by Socrates, while to the eternalist, it is a present-tensed property which has been exemplified by Socrates to provide a ground to (9)". As Brogaard claims:

"Where 'Socrates was wise' is the presentist's way of saying that there is a time at which Socrates is wise. . . " ([Brogaard 2006], p. 197)[199]

Brogaard's sentence can be also rephrased in terms of facts: it would then state that [It *is* the case that Socrates *was* wise] is the presentist's way to express [It *was* the case that Socrates *is* wise]. So far so good: the primitivist can explain the difference between her grounding of (9) and the eternalist's one.

However, things are different with CTR-claims such as (3) or (2), to which Brogaard would like to extend the intuition above.[200] Indeed, the *tensed* CTR which the primitivist is using cannot be reduced to present-tensed relations. A consequence of this is that there can be *no distinction* between strong facts expressing CTR and weak facts expressing CTR, since the difference between strong past facts and weak past facts presupposes that strong past facts are construed out of present-tensed facts by means of the ordinary tense machinery. If this machinery and construction cannot be displayed – as with tensed CTR – the distinction between a strong sense and a weak one obviously fades. Consequently, the primitivist cannot differentiate between the obtaining in the present of a past fact (that is a weak past fact) and the obtaining in the past of a present fact (that is a strong past fact). Irreducible cross-temporally tensed facts just "partly hold" (so to say) in the past and "partly hold" in the present. Now take *being taller than — was*. Entering now the past-tensed side ("*taller than — was*") of this tensed CTR is nothing over and above having entered a relation with the other relatum in the past. In other words, the presentist cannot explain the ground of (3) by confining herself to say "To me, (3) is made true by a tensed CTR being *now* exemplified by Jules and his ancestor". Indeed, the relation is exemplified *now* by

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[199] Notice that what Brogaard is saying here can be seen as the linguistic counterpart of the ontological principle that weak past facts are presently holding facts, exactly as the ones which are expressed by using only present tenses (that is, the classical "present facts").

[200] See [Brogaard 2006], p. 197.

Jules, and *previously* by his late ancestor. Converting this in fact-talk, the presentist cannot explain the ground of (3) by having recourse to a weak past fact. However, she cannot have recourse to strong past facts either, because of a category issue: the distinction "strong/weak" does not apply to tensed CTR. As a consequence, the primitivist has no mean to distinguish herself from the eternalist when explaining why (9) is true,[201] and this – in turn – makes it impossible for her to reply the sceptic's classic objection[202].

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[201] By contrast, the eternalist can explain the difference, since they can read (3) as concealing between objects and times or between temporal parts of objects. True, she cannot distinguish their position from the primitivist account in a way that meets the sceptical challenge. But this is a problem for the primitivist, not for her.

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Presentism, Primitivism and Cross-Temporal Relations: Lessons from Holistic Ersatzism and Dynamic Semantics

Berit Brogaard

1. Introduction

Metaphysical eternalists occasionally offer presentists the following challenge: If only present things exist, how are we to account for the truth of claims of the following sort:

(1) Al Gore is taller than almost any ancient politician

(2) Russell was smarter than most philosophers of his generation

(3) The short circuit caused the fire

The alleged problem for the presentist is that claims like these would seem to ascribe relations one or both of whose relata do not exist. But this violates the Principle of Relations:

Principle of Relations: if $x, y, z, \ldots$ stand to each other in relation R, then $x, y, z, \ldots$ exist.

Non-serious presentism allows past instantiations and hence entails a rejection of the Principle of Relations. But few have found non-

serious presentism convincing,[203] mainly because it seems to commit us to Meinongian entities.

In previous work I have developed and defended a view I call "primitivism about tensed relations".[204] This view rejects the Principle of Relations but does not commit us to Meinongian entities. Objectors have subsequently argued that my view does entail a commitment to Meinongian entities after all, that there is no time at which my primitive relations are instantiated, that I violate the grounding principle and that my version of presentism does not meet minimal explanatory requirements. On account of these objections, I will expand on the view here. I will also offer a supplementary strategy that even the most hardcore of truth-maker enthusiasts should accept. This strategy borrows from holistic modal ersatzism and dynamic semantics.

2. Reductionism: A Lesson from Linguistics

At first glance, the most attractive way for the presentist to deal with the problem of cross-temporal relations is to learn from the teachings of linguists. The problem of offering a correct semantics of comparative claims, including cross-temporal claims, has long been a central topic of linguistics. Consider the following comparative claims:

(4) John is taller than every girl

(5) John is taller than one of the girls

As Richard Larson argues [Larson 1988], such claims can be dealt with by positing that (i) the quantified noun phrase (e.g., 'every girl' or 'one of the girls') moves to a wide-scope position and (ii) the comparative expression 'taller than' combines with two type e

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[203] Exception are [Hinchliff 1988] and [Sanson and Caplan 2010].
[204] See [Brogaard 2006].

expressions (i.e., variables or referring terms). On this view, (4) and (5) have the following underlying logical forms:

(4a) [Every girl x]taller-than(John, x)

(5a) [One of the girls x]taller-than(John, x)

The problem with this suggestion is that it is difficult to see how it would apply to the following variations on (4) and (5):

(6) John is taller than every girl is

(7) John is taller than one of the girls is

   Applying the same strategy would give us:

(6a) [Every girl x]John is taller than x is

(6b) [One of the girls x]John is taller than x is

However, 'than'-clauses of this form are syntactically akin to relative clauses such as 'that every girl likes' as it occurs in 'John is a guy that every girl likes'. Quantified noun phrases cannot scope out of relative clauses. As 'than'-clauses are syntactically akin to relative clauses, it is extremely implausible to think that quantified noun phrases (e.g., 'every girl' and 'one of the girls') can move to a wide-scope position.

   Moreover, as Irene Heim has argued, even if quantified noun phrases could scope out of 'than'-clauses, modal expressions, adverbs of quantification (e.g., 'Mary *typically* eats breakfast') and floating quantifiers (e.g., the girls all went outside') cannot possibly do that. Out-of-'than'-clause treatments of comparatives are thus unable to account for claims of the following sort (from Heim):

(8) The suit cost more than they had each paid in taxes.

(9) It is warmer here today than it usually is in New Brunswick.

(10) It is warmer today than it might be tomorrow.

(11) George is richer than his father was and his son will be.

After considering and rejecting other traditional analyses of comparatives, Heim offers a theory according to which comparatives ascribe relations between what she calls "degrees" (i.e., abstract entities like heights, weights, etc.). To account for quantifier scopes, Heim suggests that there are semantically vacuous 'wh'-items in the sentence structure of comparative claims. For example, 'John is taller than every girl' has the logical form 'John is taller than every girl is wh'. To a first approximation, 'every girl is wh' is to be read as: 'every girl x. x is *this* tall'. 'Every girl is wh' scopes out of the comparative clause, and the 'wh'-item raises to a wide-scope position. 'John is taller than every girl is' is thus of the following form:

wh2[every girl is t2]1 [John is taller than t1]

The truth-condition for this sentence is: for every girl x, John's height is greater than x's height.

From a semanticist's point of view, Heim's hypothesis is interesting because it makes the right predictions in nearly every case. From a metaphysician's point of view, her theory is interesting because it makes presentism look less unattractive. Consider:

(12) Al Gore is taller than almost any ancient politician ever was

Heim's theory predicts that this sentence is of the following form:

wh2[almost any ancient politician was t2]1 [Gore is taller than t1]

Assuming that the past tense takes wide scope over the quantified noun phrase 'almost any ancient politician', we get the following truth-condition: It was the case that, for almost any ancient politician x, Gore's height is greater than x's height. As this

analysis incurs no commitments to the existence of non-present individuals, the presentist can happily embrace it.

If only life was this easy! Heim's reductionist strategy for dealing with comparative claims works splendidly as a way for the presentist to deal with *internal* cross-temporal relations, relations that supervene on the intrinsic properties of their relata. But it is very plausible that there are also *external* relations, for instance, causal relations. Unlike internal relations, causal relations do not supervene on the intrinsic properties of their relata, which is to say, we cannot account for them by citing intrinsic properties of their relata and using a few analytic skills. So, the reductionist strategy fails to offer an account of causal relations.

The presentist may attempt to evade the problem of causation by introducing the primitive explanatory notion 'BECAUSE'. Suppose you want to say that eating a large lunch an hour ago caused you to have a tummy ache now. With the full range of tense operators available for her to exploit, the presentist can express this as follows:

ONE HOUR AGO(BECAUSE I am eating a large lunch, it WILL be the case an hour later that I have a tummy ache)

However, even if we understand 'BECAUSE' well enough pre-theoretically to let it serve as a primitive notion, this proposal does not offer an adequate account of causal relations. Ted Sider provides the following counterexample [Sider 1999]: "Imagine a world," he says, "where objects pop out of existence, causing distinct objects to pop into existence an hour later, and suppose that [balloons] A and B disappear, and an hour later, [balloons] C and D appear. Which of the two [balloons] appearing were caused by which of the first two [balloons]?" There are two possibilities here:

Possibility 1: A causes C, and B causes D

Possibility 2: A causes D, and B causes C.

How can the presentist distinguish those two possibilities? If the balloons are qualitatively different, she can appeal to the qualities that distinguish the balloons. If A is almond, B bronze, C carmine and D denim, she can say:

> ONE HOUR AGO(BECAUSE almond balloon deflates, it WILL be the case an hour later that carmine balloon inflates, and BECAUSE bronze balloon deflates, it WILL be the case an hour later that denim balloon inflates)

> ONE HOUR AGO(BECAUSE almond balloon deflates, it WILL be the case an hour later that denim balloon inflates, and BECAUSE bronze balloon deflates, it WILL be the case an hour later that carmine balloon inflates)

But, as Sider continues, the problem is that the balloons could be intrinsic copies of each other, or the world could be symmetric, leaving the presentist with no descriptive way of picking out the balloons.

3. You Can't Do That Either

How can the presentist respond to Sider? One possibility is for her to point her finger at the eternalist and say "Ha, you can't do that either!" Few eternalists, besides David Lewis, want to grant that there are concrete non-actual possible worlds. If they allow for possible-world talk but don't go the whole way like Lewis did, then they too are likely to have difficulties distinguishing the aforementioned scenarios.

Why? Because as the counterexample is stated, it doesn't really have anything to do with cross-time relations. Rather, the problem is that if you do not grant the concrete existence of some entity X, you cannot refer to X, you can only represent or describe it. Eternalists who do not grant that non-actual possible scenarios are con-

crete existing entities can only describe the two scenarios; they cannot refer to any entities in the scenarios. But if there is no descriptive way of distinguishing the scenarios, the eternalist cannot distinguish them.

To generate a problem that is specifically a problem for the presentist but not a problem for the eternalist who denies the existence of concrete non-actual worlds, we cannot appeal to indistinguishable possible scenarios. Instead we must appeal to indistinguishable temporal scenarios. I propose the following counterexample to the presentist who proposes to use the primitive 'BECAUSE' to solve the problem of causation. Imagine a balloon scenario in which there are two pairs of times $\{t_1, t_2\}$ and $\{t_3, t_4\}$ and two indistinguishable balloons, A and B, such that the only difference between the two pairs of times $\{t_1, t_2\}$ and $\{t_3, t_4\}$ is that A's deflating at t_1 causes B's inflation at t_2, and B's deflation at t_3 causes A's inflation at t_4. If this sort of scenario were to occur in the actual world, the eternalist would be able to distinguish the two causal facts, but the presentist would not. Or so the envisaged objection goes.

Stating the problem this way makes it more clear how distinguishing different scenarios may pose a special problem for presentism but it is not really a fair objection to presentism, as an analogous problem faces the eternalist who does not want to join forces with the genuine modal realist. The problem that Sider was initially touching on really has nothing to do with causation. Rather, the problem is that of distinguishing non-existing scenarios that differ only in either the haecceities (individual essences) or the non-describable causal powers of the entities occupying them. This is not to say that the problem isn't genuine but only that it is not one that bears directly on whether or not you grant that there can be external cross-temporal relations. I will offer a reply to the problem of distinguishing indiscernibles below.

The real problem with offering 'BECAUSE' as a primitive notion to solve the problem of external cross-temporal relations is not that it reduces the presentist's abilities to describe modal or tempo-

ral facts but rather that it makes causation magical. On the envisaged view, there are causal facts of the form 'Because E_1, E_2', where E_1 is an event that takes place earlier than E_2. But if there are no external cross-temporal relations, then how are we to understand the claim that one event happens BECAUSE of another? We haven't been told that. Magically, E_1 and E_2 are causally related merely in terms of their intrinsic properties and the mysterious primitive 'BECAUSE'.

4. Primitivism to the Rescue

In previous work I have suggested that the presentist accepts what I call 'primitivism about cross-temporal relations'. My proposal was to introduce the notion of a primitive tensed relation. Where 'Socrates was wise' is the presentist's way of saying that there is a time at which Socrates is wise, 'my daughter was taller at age two than my son was at age two' is the presentist's way of saying that my daughter, as she exists at a time at which she is two, stands in the *taller than* relation to my son, as he exists at a time at which he is two. The eternalist would treat the latter claim as a tenseless quaternary relation among my daughter, my son and two times. Tenseless quaternary relations among individuals and times are not reducible to binary relations and quantification over times. Likewise, tensed binary relations are not reducible to tenseless binary relations and tensed existence claims. 'My daughter was taller at age two than my son was at age two', for example, is not reducible to 'it was the case that my daughter is two, and it was the case that my son is two, and my daughter stands in the relation of being taller than to my son'.

We can represent tensed relations using lambda operators. Where the property of having been nice can be represented as $\lambda x(x$ has been nice), the tensed binary relation ascribed by 'My daughter is now taller than my son was' can be represented as $\lambda x \lambda y(x$ is now taller than y was). The former reads: the property of being an x such that x has been nice; the latter reads: the relation between x and y such that x is now taller than y was.

Tensed binary relations such as $\lambda x \lambda y(x$ is now taller than y was) can obtain between individuals that never existed at the same time. So, if there are tensed binary relations, then the Principle of Relations is false. To prevent tenseless relations from obtaining among individuals that do not co-exist, the presentist should assent to a revised Principle of Relations:

Principle of Relations*:   If $x, y, z, \ldots$ stand in the tenseless relation R, then $x, y, z \ldots$ exist.

Given the revised Principle of Relations, the tenseless relation $\lambda x \lambda y(x$ is taller than $y)$ cannot hold between two individuals unless they both exist, but the tensed relation $\lambda x \lambda y(x$ is now taller than y was) can.

In the wake of offering my primitivist theory, I received several responses, some in print and some verbally.[205] I shall briefly reply to them here.

One objection was that since there is no time at which my relations are instantiated, they are never instantiated. By way of reply, I agree with the objector that there is no one time at which my primitive cross-temporal relations are instantiated, but it does not follow that they are not instantiated at all. It only follows that they are not instantiated all at once.

The presentist is already committed to the view that there are properties that are not instantiated all at once. No serious presentist would deny that there are events, such as car crashes, overseas flights, parties, hookups, marriages and lives. We have seen these things, participated in them, enjoyed them and endured them. On a common view of events, events are properties instantiated by an array of entities. But unless we are dealing with an instantaneous event, there is no single time at which an event is instantiated. The

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[205] [Torrengo 2006], [Torrengo 2010], Matt McGrath (personal comment) and Ciuni and Torrengo (present volume).

majority of events are instantiated one bit at a time over long time intervals.

Instantiated tensed relations are similar to events in this respect. There is no single time at which they are fully instantiated. They are instantiated in a piecemeal fashion.[206] Below I will explain in further detail how to make sense of this.

A second, related, objection to my view is that it entails a commitment to Meinongian entities and therefore is not a form of serious presentism. I never fully understood what is wrong with Meinongian entities but for the purposes of this paper, I will grant that they are frivolous entities better avoided.[207] In the end, it doesn't matter anyway whether we allow Meinongian entities into our ontology or not, because my view does not entail a commitment to Meinongian entities. A Meinongian entity is an entity that has being but which does not exist. My theory does not presuppose that there are entities with being that do not exist. Socrates does not exist. Period. But he did. So, I can now be taller than he ever was, and someone pointing to a little super-baby back in Ancient Greece, saying "You shall be named Socrates" (in Greek, of course) can be part of a causal chain connecting my current use of 'Socrates' to a man that once existed.

A third, and related, objection to my view is that it entails that cross-temporal truths do not have truth-makers. I never was a big fan of truth-makers but I have encountered too many truth-maker enthusiasts in my life to feel that it would be irresponsible not to jump on the train (briefly) and address their concern. I reply as follows: Requiring that the presentist conjures up presently existing, instantiated properties and concrete objects to serve as truth-makers for their claims is to dismiss presentism outright. When I go to a party, the party lasts for a while; it does not exist all at once. Do truths about parties have truth makers? Yes, I have seen

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[206] I defend a similar view of objects in [Brogaard 2000].

[207] For a defense of a present framework that allows past instantiations, see [Sanson and Caplan 2010].

them (one bit at a time), enjoyed them and been bored at them. The same goes for cross-temporal claims. They have tensed relations that are instantiated in a piecemeal fashion as their truth-makers.

A final objection I shall address here is one set forth by Roberto Ciuni and Giuliano Torrengo in this volume. They raise the concern that my primitivist view does not meet minimal explanatory requirements. The principle they want the presentist to stick to is this one:

ES Given a proposition *p* saying that things were in a certain way, in order for *p* to be true, the (present state of the) world t^* – or at least one object in it – must instantiate a property *P* which 'is about' the same thing as *p*.

My response is that this principle puts too much of a demand on the presentist for exactly the same reason that the standard truth-maker objection, or grounding objection, does. It does not allow that things that did exist or things that will exist can explain the truth of claims about the past or future. Of course, if I say 'A man called "Socrates" was a philospher', this is true in virtue of the world having the past-tensed property of it being such that a man called 'Socrates' was a philosopher. But 'I am at a party now' is not true in virtue of me being at an event instantiated in a thing that presently exists. What presently exists is not a party. What makes my claim that I am at a party true is that I am in the middle of something that had parts in the past and will have parts in the future.

The eternalist may rejoin that if I cannot describe how the (present state of the) world is without having to resort to something future or past, then non-present states are required in order to explain why the (present state of the) world is the way it is. But then it would seem that the past and future have the same ontological priority as the present.[208] This, however, is not quite right. Pointing to how things used to be is indeed required in order to explain why

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[208] Thanks to Roberto Ciuni for pressing this objection.

the present state of the world is the way it is. However, presentism is a claim about what exists. What exists is the (present state of the) world. So, the (present state of the) world is ontologically prior to what once was and what will eventually be.

If you remain unconvinced and want the presentist to stick to the Principle of Relations, **ES** and strict grounding requirements, I will now argue that you can have your way.

5. Holistic Ersatzism

We cannot use a presentist language to say a lot of what I have said above. For example, if we want to say that the presentist holds that events are not instantiated all at once, we need a tenseless language. The need for a tenseless language, together with the pressure from truth-maker enthusiasts, calls for a supplementary presentist ontology.

A promising way to go for the presentist is to take the ersatz route. Few thinkers embrace genuine modal realism a la David Lewis but many folks think it's attractive or convenient to treat worlds as maximally consistent sentences or Kripke models in which entities in the actual world represent possible worlds, individuals, properties and relations.

Lewis called this approach to modality "ersatzism". Ersatzism, or ersatz modal realism, is a bundle of views which have in common the feature that they deny that there is a plurality of concrete worlds. Instead of a plurality of concrete worlds there is a myriad of abstract or proxy concrete entities purporting to represent ways that this world and its inhabitants might have been. Ersatzism allows us to do lip service to genuine modal realism without being committed to concrete spatio-temporal worlds.

The ersatz option is also open to the presentist, and if nothing else comes from it, at least it gives the presentist a meta-language

in which to say things such as 'events do not occur all at once' and 'cross-temporal relations are instantiated in a piecemeal fashion'.

Because possible worlds are not supposed to interact causally, causation is not a problem that the modal ersatzer has to deal with, but the presentist can construct a causation-friendly version of ersatzism that allows her to talk about causation. There are a couple of ways to go. Craig Bourne (2006) and Tom Crisp (2007) defend inter-esting versions of traditional ersatzism. I prefer a slightly different holistic approach.

Different versions of holistic ersatzism have been proposed and defended by Arthur Prior and Kit Fine ([Prior and Fine 1977], p. 148), Daniel Nolan ([Nolan 2002], chapter 5) and Ted Sider ([Sider 2002]). I am going to take inspiration from Sider's version here. Following Sider's recipe for constructing a holistic modal ersatzism, we can construct an analogous holistic temporal ersatzism. Sider proposes to treat possible-world talk as talk about a single proxy pluriverse that purports to represent all the possible worlds and individuals at one fell swoop. More carefully: Since there will be many entities that represent the pluriverse equally well, possible world talk must be treated as talk about proxy pluriverses (in the plural). But, says Sider, ideally these entities will be either isomorphic (modal models) or equivalent (pluriverse sentences).

I propose that we, in an analogous manner, treat talk of times as talk about proxy temporal pluriverses or universes.[209] The proxy temporal universes are either Kripke models or proxy temporal universe sentences interpreted in these models (i.e., maximal descriptions of a Kripke model). For each eternalist time we want to represent, there is a distinct class of isomorphic models or a distinct equivalence class of sentences. Each of these models or sentences will talk about past, present and future times as if they ex-

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[209] See [Jaszczolt 2009] for an excellent defense of the view that temporality just is modality and should be treated analogously to the standard treatment of modality.

isted. But it is the class of isomorphic models or equivalent sentences that represent real times as they really pass by.

The Kripke models contain sets of entities that represent past, present and future times, past, present and future individuals and past, present and future properties (and relations). Since the models contain only actual entities, proxy temporal universe sentences interpreted in these models do not incur a commitment to past or future times or individuals. For instance, we might treat paper clips as representing times, pens as representing individuals, lamp shades as representing properties, and so on.

Proxy temporal universe sentences are constructed in an infinitary eternalist language. Tensed claims are constructed in an infinitary tensed language. The main difference between the two languages is that where the "eternalist" language contains variables ranging over times, a constant $@$ naming the present time, and the predicates 'exists at' and 'earlier than', the tensed language contains tense operators. The two languages are interpreted in the same temporal models. A canonical proxy temporal universe sentence will have the following form:

> THERE ARE times $t_1, t_2 \ldots$ such that t_1 is earlier than t_2 and THERE ARE properties and relations $p_1, p_2 \ldots$ that are distinct from the following actual properties and relations: $\ldots$, and THERE ARE past and future individuals $x_1, x_2, \ldots$ that are distinct from the following present individuals: ..., such that: ... t_1 ...and ... t_2 ...and ...

The conjunction at the end of the proxy sentence contains an open clause for each time, for example, x_1 and x_2 exist at t_1 and t_2 ...and x_1 and x_2 instantiate the properties p_1 and p_2 ...and x_1 and x_2 stand in the relation p_3. . . The proxy sentences furthermore contain a completeness clause stating that there are no times other than those denoted by the present time $@$ and the variables ti, and no individuals or properties other than those denoted by the constants and the variables xi and pi.

Sentences that have this form will not in general be realistic. Some models contain "past times" at which there are "conscious computers" and "blue swans". Maximal descriptions of such models do not adequately represent the temporal universe. A description (or temporal universe sentence) adequately represents the proxy temporal universe iff it is true with respect to realistic models, where a model is realistic if it is faithful to past, present and future facts.

Truth in a tensed language like English (including truths such as 'I am now taller than Socrates ever was') determines what the past, present and future tensed facts are and thus which temporal models are realistic. For example, since there were no past times at which there were conscious computers or blue swans, there is no realistic model containing a past time at which there are conscious computers or blue swans. So, no proxy universe sentence that adequately represents a proxy universe entails that there once was a conscious computer or that there once was a blue swan, which is as it should be. Since present-tensed truths about the present time are true in the tensed language (English), the present time will encode all non-past and non-future truths about the world in any realistic model. To reinterpret tensed claims, we treat them as claims that are true in every realistic model.

On the holistic ersatz account, there is a distinct proxy universe for each real time. I have not said anything about how the proxy universes corresponding to the real times relate to each other. And for good reasons: The distinct proxy universes don't relate to one other. What determines what each proxy universe contains is the sets of tensed truths corresponding to each real moment.

As 'Brit is working on a paper' is true now, the proxy universe corresponding to the present moment is one in which Brit exists and Brit is working on a paper. As 'Brit is working on a paper' will be false in two hours, the proxy universe corresponding to that moment is not one in which Brit both exists and is working on a paper.

Likewise, 'Brit is taller now than Socrates ever was', when uttered now, is true. So, the proxy universe that corresponds to the real time is one in which Socrates exists before Brit and in which Brit being taller than Socrates at any time at which he exists. If someone had uttered the sentence when I was a baby, it would have been false. So, there is no proxy universe that corresponds to that moment according to which Socrates exists before Brit and Brit is taller than Socrates at any time at which he exists.

Causation in the proxy universe is unproblematic. If 'my dropping the glass two minutes ago caused it to break'is true in English when uttered now, then the proxy universe that corresponds to the real time is one in which Brit's dropping a glass causes the glass to break.

We thus need no coherence between the proxy universes corresponding to real times, beyond what the tensed truths give us. Think of it this way. At each real time really passing by, an omniscient and all-powerful being, WILL, instantly builds a huge LEGO model that contains all the eternalist stuff (earlier-than relations, quantification over times, etc). The red LEGOs represent earlier-than relations, the blue LEGOs represent past times, the yellow LEGOs represent future times, and so on. WILL knows how to build the model because she knows what the past and present tensed truths are. Because past-and present-tensed truths themselves ensure coherence from model to model, WILL need not add coherence between the models she builds. So, she can put together a LEGO representing me, a LEGO representing the property is writing, two LEGOs representing the present moment and a moment two hours from now and a LEGO representing the earlier-than relation. As I am writing now, the LEGO model she built two hours ago contains LEGOs corresponding to "Brit will be writing two hours from now". As I will not be writing two hours from now, the LEGO model she now builds instantaneously does not contain LEGOs corresponding to "Brit will be writing two hours from now".

How is ersatz presentism to account for the fact that there could have been alternative pasts?[210] Two kinds of truths are relevant here. One is of the form 'It has been the case that φ'. Another is of the form 'It could have been the case that φ'. To deal with these sentences we need to include variables ranging over non-actual entities (nonactual individuals y_1, y_2, . . . , non-actual times u_1, u_2, . . . and non-actual worlds w_1, w_2, . . .) within each set of proxy temporal universe sentences. Assuming world-bound individuals and overlapping domains, the ersatz pluriverse must represent multigrade properties with an extra place for worlds and times. Thus, the conjunction at the end of the proxy sentence contains an open clause for each time that specifies modal truths of the form 'x_1 instantiates p_1 at world w_1 and at time u_1, . . . '. The English sentences 'I could have been a linguist' and 'It has been the case that I could be a linguist' then specify a clause in the proxy pluriverse sentence of the form 'x who is presently called "Brit" at the actual world and who is presently a philosopher at the actual world and who . . . instantiates the property of being a linguist at t_1 at w_1, . . . '.

Note that ersatzism is not an alternative to primitivism. As David Lewis pointed out ([Lewis 1986]), ersatzism has no legs to stand on without primitive modal or temporal notions. So, ersatzism is a perfectly natural development of primitivism. We need our new proxy eternalist language to talk about presentism and to provide the presentist with a way of distinguishing swapping scenarios.

So, how exactly does the ersatzer distinguish between the swapping scenarios we looked at earlier? With respect to an imagined popping balloon universe, the realistic proxy temporal universe sentences entail that there are two pairs of times and two indistinguishable balloons, A and B, such that the only difference between the two pairs of times $\{t_1, t_2\}$ and $\{t_3, t_4\}$ is that A's deflating at t_1 causes B's deflation at t_2, and B's deflation at t_3 causes A's inflation at t_4. The reason we can distinguish these two scenarios given holistic ersatzism is that when both scenarios occur

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[210] Thanks to Jens Christian Bjerring here.

in one and the same proxy sentence, we can introduce different variables for the different qualitatively indistinguishable entities.

Standard versions of ersatzism treat each world or time as a proxy sentence. So, qualitatively indistinguishable scenarios will be indistinguishable. This ability to distinguish possibilities that contain indistinguishable items is the main strength of holistic ersatzism compared to non-holistic ersatzism.

6. Ersatz Presentism and the Phenomenological Argument

One might be worried that once we create proxy temporal universes to serve as truth-makers for temporal truths, we no longer have a form of presentism on our hands. As the proxy temporal universes entail that there are present and future times, the proposal entails that past and future times exist. But if there is a past time at which someone called 'Socrates' is walking the streets of Athens barefooted, then there is someone called 'Socrates' who is walking the streets of Athens barefooted. So, it is true that there are past and future things. Doesn't that make the ersatz view a form of eternalism?

This question, however, is just playing with semantics. I could say "yes" but I would add that the way in which the view is eternalist is rather uninteresting, just as uninteresting as the way in which modal ersatzism is a form of modal realism. Typically, the interesting debate is not between modal realism ind modal anti-realism (though there are interesting debates here too), but between genuine modal realism and ersatz (or sometimes fictional) modal realism.

I don't think that we stray too far away from standard presentism by allowing the presentist to quantify over "past" and "future" things in the metalanguage and even occasionally in the osject language. The only "past" and "future" entities to which the presentist grants existence are abstract entities or proxy entities created out of present entities. She does not grant eeisteice to any past

or future physical or phenomenal entity. Because "past" and "future" ersatz entities *do* presently exist, they are not in the past or in the future, physically or phenomenally speaking. They merely serve as stand-ins for such entities. They are actors in a play we set up in order to be able to explain primitivism to those who do not share our pre-theoretical understanding of the primitive facts. So, while we don't get the standard set of presentist truths, ersatz presentism is fully committed to the view that only present things exist.

In my view, despite being able to quantify over "past" and "future" entities, ersatz presentism clearly is a form of presentism, not least because the original motivations for thinking that presentism is true are equally good reasons for thinking that ersatz presentism is true.

To illustrate let me conjure up an argument in favor of presentism.[211] The argument runs as follows: Conscious mental states about the past and mental states about the future have a different phenomenology. Mental states about the past, such as memories, have the phenomenal property of representing something as past, whereas mental states about the present have the phenomenal property of representing something as present.[212] We can have a memory of a scene that is qualitatively identical to a scene that we now perceive. So, leaving aside the possibility of systematic error, there must be a non-qualitative difference between how we relate to past and present objects. This non-qualitative difference could be a difference in the temporal location of the object of our mental states (e.g., 3 o'clock vs. 4 o'clock) or a difference in where our con-scious minds are located relative to their objects. Temporal location by itself need not make a difference to phenomenology. If I don't know what time it is, my experience of typing at the computer could be the same whether it's 3 o'clock or 4 o'clock. What

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[211] Strictly speaking, it's an argument for any view that attributes a special ontological status to the present. But my main purpose here is not to argue for presentism. So, I will ignore that complication here.
[212] I am here following the terminology from [Chalmers 2004].

does make a difference to phenomenology is where our conscious minds are located relative to the objects of our mental states. But the most natural explanation of this difference is that there is a difference in ontological status between past and present.

The important point here is not whether this kind of argument is sound but rather that it is equally effective as an argument in favor of presentism and ersatz presentism, which is why I am tempted to think that the move from old presentism to ersatz presentism does not change the debate between presentists and eternalists significantly.

Ersatz presentism should not be confused with Timothy Williamson's doctrine of necessary existents.[213] When applied to the temporal dimension, this doctrine entails that only present things are concrete. Present things don't cease to exist as times passes; they become abstract. Ersatz presentism is different. According to Ersatz presentism, things come into and go out of existence. When they go out of existence, we use proxy entities to represent them and to serve as the semantic values of our talk about them. So, whereas Williamson's doctrine of necessary existents is a genuine form of eternalism, ersatz presentism is not.

7 Lessons from Dynamic Semantics

Let us return now to the question of how to make sense of a truth-maker that is non in existence all at once, such as at event or on instantiated relation.

One of the deeper reasons for philosophers' attraction to eternalism, I believe, is that classical semantics and logic do not allow information updates to take place. But we are now familiar with the shortcomings of classical semantics and logic. Only a dynamic semantics and logic can deal adequately with discourse. Consider

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[213] For the doctrine of necessary existents, see [Williamson 2002].

the following thought process about what is going on in the cafè in which you are currently drinking your morning coffee:

> There is Lisa standing in the line getting her coffee as usual. She never eats. She is kind of cute. OK, she is coming over here now. Hope she doesn't see my pimple. I almost can't believe it. She is actually sitting down at my table. I'd better say something clever.

This discourse fragment is contradictory. Lisa is not standing and sitting relative to any circumstance of evaluation. The idea of information updating thus becomes significant. For each new piece of incoming information, we must update the circumstance of evaluation in order to correctly evaluate the information for truth or falsity. The above discourse fragment represents an event that serves as the fragment's truth-maker. Importantly, the truth-maker is not in existence all at once.

Following Irene Heim, let us introduce the notion of a filing system, that is, a system that keeps track of variables, names, and descriptive material introduced by the discourse. We expand our filing system as follow:

(11) $John_1$ is now_1 spotting $Susan_2$.

Filing system F1:

x, y, t_1

Now t_1

John x

Susan y

Spot (x, y)

Additions to the discourse give rise to a new system:

(12) He₁ is now₂ walking over to her₂.

Filing system F2:

x, y, t₁ x, y, t₂

Now t₁ Now t₂

John x

Susan y

Spot(x, y) $\Rightarrow$ Walk over to (x, y)

(13) And is now₃ starting a conversation with her₂

Filing system F3:

x, y, t₁ x, y, t_2 x, y, t₃

Now t_1 Now₂   Now t₃

John x

Susan y

Spot(x, y) $\Rightarrow$ Walk over to (x, y) $\Rightarrow$ Start a conversation with (x, y)

(14) She$_2$ is now$_4$ talking to a man$_3$.

Filing system F4:

x, y, t_1 x, y, t_2 x, y, t_3 x, y, z, t_4

Now t_1 Now t_2 Now t_3 Now t_4

John x

Susan y

Man z

Spot$(x, y) \Rightarrow$ Walk over to $(x, y) \Rightarrow$ Start a conversation with (x, y) $\Rightarrow$ Talk to (k, z)

(15) Now$_5$ he$_1$ is talking to the man$_3$ she$_2$ talked to just a moment ago$_4$

Fliing system F5:

x, y, t_1 x, y, t_2 x, y, t_3 x, y, t_4 x, y, t_5

Now t_1 Now t_2 Now t_3 Now t_4 Now t_5

John x

Susan y

Man z

Spot $(x, y) \Rightarrow$ Walk over to $(x, y) \Rightarrow$ Start a conversation with (x, y)
   $\Rightarrow$ Talk to $(y, z) \Rightarrow$ Talk to (x, z)

Discourse fragments express dynamic intensions, which are sequences – of sets of possible (static) scenarios – that share a filing system. Developing a fully adequate dynamic semantics is beyond the scope of this paper. Those who are interested in the details of the proposal can take a look at the dynamic two-dimensional semantics I develop in [Brogaard forthcoming].

The sort of dynamic system outlined above represents events in a way that is compatible with presentism. The full event is not in existence all at once but moves in and out of existence from t_1 to t_4.

The same goes for the relata of cross-temporal relations. Despite not being in existence all at once, the relation and its relata constitute the truth-maker for cross-temporal truths. Consider the cross-temporal truth that I am taller now than Socrates ever was. I prefer to think of its truth-maker in this way. First Socrates comes into existence, then some time passes, then I come into existence and some time passes and now I stand in the *taller-now-than — ever-was* relation to Socrates. The cross-temporal relational truth came into existence just now but parts of the truth-maker popped into and out of existence long before the cross-temporal relational truth came into existence.

Once we pay closer attention to the dynamic nature of everything around us, including our conversations, our thought processes, our belief systems and our person-alities, I think the temptation to build an ontology grounded in the static logic and semantics we were taught to like back in college completely vanishes.[214]

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Part 3

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Alternatives to Presentism

A Heterodox Presentism: Kit Fine's theory

Jonathan Tallant

1. Introduction

Kit Fine ([Fine 2005]) has articulated a position according to which reality is fragmented. In this paper I will refer to this view as 'Heterodox Presentism'. I want to try and do two things. First, I want to try and undermine the arguments presented by Fine in favour of Heterodox Presentism and show that the view is unmotivated – in part by the fact that it fails to meet some of the standards that Fine sets for it. The second target aim is to offer some very informal and sketchy remarks as to how we might better construe the 'standard' view of realism, or 'presentism' to which Fine objects – the view that I will define here as 'only present objects exist'. As we shall see, my own view of presentism differs quite substantially from this pithy slogan.

With these aims in mind let us now turn to Fine's view.

2. Fine's Heterodox Presentism

According to Heterodox Presentism, it is not the case that reality is a single coherent whole. Indeed,

> [u]nder such a view, reality will be fragmentary. Certain of the facts constituting reality will 'cohere' and some will not. Any fact is plausibly taken to be-

long to a 'fragment' or maximally coherent collection
of facts;
and so reality will divide up into a number of differ-
ent but possibly overlapping fragments. ([Fine 2005]
p. 281)

The reasons Fine thinks we should endorse such a view are
complex and varied, but a significant part of the structure of
Fine's argument derives Fine's presentation of McTaggart's
argument. The sophisticated version of this argument, Fine
presents thus:

Realism Reality as composed of tensed facts.

Neutrality No time is privileged, the facts that compose reality
are not oriented towards one time as opposit to another.

Absolutism The composition of reality is not irreducibly rela-
tive, i.e. its relative composition by the facts must be
explained in terms of its absolute composition by the
facts.

Coherence Reality is not irreducibly incoherent, *i.e.* its compo-
sition by incompatible facts must be explained in terms
of its composition by compatible facts ([Fine 2005], p.
273).

Fine claims that these theses are incompatible with one an-
other. We can generate a taxonomy of competing views, and
get a sense of the logical space available to us, by denying
various of these incompatible theses. One may deny *Realism*
and endorse a tenseless theory of time (e.g. [Oaklander 2004]);
one may deny *Neutrality*, and endorse what Fine calls Standard
Realism (e.g. Presentism); one may deny *Absolutism* (and en-
dorse another Non-standard Realism – a move that I won't
touch upon here), or one may take Fine's preferred option and
deny *Coherence*.

Let us get clear on the notion of "realism" in play. Fine talks repeatedly in the above about reality being capable of being fragmented, coherent, absolute, and the like. It will therefore prove useful to have an understanding of quite what is meant by 'real'.

According to Fine, it is doubtful that we can offer up a satisfactory definition of the concept of reality ([Fine 2005], p. 267). However, we can still make two claims: one formal, one elucidatory. The formal remark is that we are to introduce a formal operator 'in reality it is the case that'. The elucidatory remark is that it may help to talk of reality in terms of a 'container'. Thus, we shall say that 'reality contains – or is constituted by or is composed of – the fact that I am sitting' ([Fine 2005], p. 268).

Staying within the informal idiom, then, Fine's Fragtentalism – his Heterodox Presentism– amounts to the view that there is only one container, but that the facts contained within the whole of reality fail to cohere. However, there are various fragments of this reality and within each of these fragments we find only consistent facts. We may thus suppose that one 'fragment' includes the tensed facts that: there were dinosaurs; there is a coalition government in Great Britain; there will be Mars outposts. Another 'fragment' includes the tensed facts that: there were dinosaurs; there is a Labour government in Great Britain; there will be a coalition government. These 'fragments' are partially overlapping in the sense that they both contain the same tensed fact 'there were dinosaurs', but the fragments themselves are obviously distinct. This is, of course, all very informal; but it is as well to have a sense of the view.[215] Since the idiom is Fine's, I see no harm in deploying it here to aid our understanding of the official view.

Now as Fine makes clear, the standard move made by those who look to defend what we might crudely call a 'tensed' the-

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[215] For more on realism in the sense intended here, see [Fine 2001].

ory of time has been to deny Neutrality, and allow that there is a single privileged moment, thereby endorsing Presentism (or some other tensed view). Let us now turn our attention to the arguments that, Fine thinks, undermine Standard Realism and motivate Non-standard Realism.

3. The Three Arguments

The three arguments that Fine brings forward are: the argument from passage, the argument from truth and the argument from the Special Theory of Relativity. I will focus, for the time being, on the first two arguments. For reasons that will become clear I think the argument from Special Relativity to be of only tangential interest.

The argument from Passage

According to the argument from passage, the standard realist, who denies Neutrality, has some difficulty in accounting for temporal passage. In fact, Fine's argument from passage appears to consist of three distinct, though connected, arguments. I will tackle these in order.

Passage 1

Let us begin with the seemingly benign observation that what differentiates time from space is that time flows or passes: 'there is something that one might call the passage of time, the movement of time from one moment to the next, which has no counterpart in the case of space' ([Fine 2005], p. 286). Fine claims that the way in which standard realists about tense have tried to articulate this is via the inclusion into our ontology of a property of PRESENT or NOW, and the observation that for time to pass is for successive moments to bear that property. Plainly, such a property cannot be thought of as a property that is relativised to a time – else we end up with the rather meager

result that every time is present-at-itself. Since every point in space is here-at-itself, so such a temporal property of being now-at-itself would have done little to show time genuinely distinct from space.

Suppose, then, that the standard realist stipulates that a given future time, t^+ will be present, and that a past time, t^- has been present. That, we might think, would give us passage. After all, that permits us to say that a given time will be present, and then, a little later, that a particular time has been present. That looks a lot like temporal passage.

But not so, thinks Fine ([Fine 2005], p. 287). According to Fine saying that, for instance, t^+ *will be present*, amounts to saying nothing more than that t is present and that t^+ is later than t. The picture just presented does not include passage in the sense required. It merely describes a world at which one time is present and other times are earlier than and later than that time. Given that this is the case, Fine does not think that the standard realist can account for passage.

Passage 2

Fine follows this up with an argument that purports to show that 'passage', thus construed, is in fact a tenseless fact. This is supposedly problematic because it leaves us having to provide a tenseless explanation of an allegedly tensed phenomena. This seems to leave us committed to saying:

> it is always the case that some time is present, that all earlier times were present, and all later times will be present. And this is something that even the anti realist [about tense] can accept.' ([Fine 2005], p. 287)

If the tenseless theorist (the anti realist about tense) can endorse the account of passage given, then we nave failed to state what is distinctively tensed about temporal passage.

Passage 3

Finally, Fine argues that the standard realist about tense faces a general difficulty in answering the following question:

> Given a complete tenseless description of reality, then what does he need to add to the description to render it complete by his own lights? The answer is that he need add nothing beyond the fact that a given time t is present, since everything else of tense-theoretic interest will follow from this fact and the tenseless facts. But then how could this solitary 'dynamic' fact, in addition to the static facts that the anti-realist is willing to accept, be sufficient to account for the passage of time? ([Fine 2005], p. 287)

If we cannot find some desideratum that the tenseless theory then fails to satisfy, then it is unclear why to think that considerations of passage militate in favour of the tensed theory.

Up until this point, Fine has been deploying the arguments from passage against Standard Realism about tense. But he also thinks that these arguments can be seen to motivate a Non-standard Realism. Heterodox Presentism can be seen to give us a way of accounting for passage. At each time, t, (that is, at each fragment) reality is constituted by the tensed facts that render *that time t*, present. In Fine's terms ([Fine 2005], p. 288) , 'reality is constituted by the absolute fact that t is present'. Further, we generate succession because within each of these fragments of reality, a different time is present. Thus, '[p]resentness is not frozen on a particular moment of time and the light it sheds spreads equitably throughout all time' ([Fine 2005], p. 288).

Passing on Passage

Two lines of argument will now be pursued: first, an account of passage on behalf of the standard realist (qua presentist); second, a rejection of Fine's claim that Fragmentalism goes any way to securing passage.

Presentism and Passage

To begin the presentist account of passage – such as it is – it is necessary to sketch the presentist metaphysic, as it is conceived of here. The very crude, cursory outline that was given above is that only present objects exist. And although that may well serve to capture at least part of the presentist insight, it misses out (or so I claim) on certain crucial elements of the view. Presentism, as it will be defined here, is a thesis about the *nature of existence*, not merely about what entities happen to exist. These remarks take, as their source, a claim due to Merricks ([Merricks 2007], p. 125): *"existing at the present time* just is *existing"*.

In fact I want to push slightly further than Merricks. Merricks looks to analyse 'existing at the present time' as 'existing'. There are familiar problems with tense that arise in connection with this claim. Consider the tense of the sentence giving the analysis and, specifically, the tense of the verb 'existing'. If 'existing' is read as present tensed, then our analysis says nothing more than that existing at the present time is existing presently. But so much is mere triviality. However, if 'existing at the present time just is existing' is read with 'existing' as committing us to a disjunction of tenses (has existed, exists now, or will exist), then Merricks analysis amounts to a

falsehood: existing at the present time is not to be identified with, for instance, having existed.[216]

So much is familiar enough, and there is a good deal of literature pertaining to wether or not other analysis can be given.[217] I aim to sidestep this argument. In my view – what I call 'Existence Presentism' (EP) – existence is presence. This is not obviously trivial for we have an identity claim on our hands and it is not one that can be held by the eternalist – who will, for instance, claim that the battle of Hastings exists without being present. Nor is it obviously false. There is no obvious reason to disbar the identification of presence with existence.

There is a problem, however. If I am identifying existence with presence then I quite plausibly leave two opaque notions flanking the identity relation. If we are searching for an informative analysis of presentism – the non-standard tense realism – then this is something of a problem. Obviously, more needs to be said and, since the focus of this paper is an analysis and rejection of Fine's view, I lack the space to say very much more. Let me simply note this: it would not be unreasonable to think of existence as an undefined, primitive notion. We cannot say what in is for an object to exist – it is not a property of

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[216] The OED is onside with this argument, defining 'existing' as 'That exists or has existence; that exists at any implied or specified time.' If one considers the latter clause, then the net result is that we find ourselves analyzing existing at the present time in terms of existing at an implied or specified time – presumably, the present time. Thus we find ourselves with a definition of no obvious value. Of course, it is open to the metaphysician to say that they are using the term 'existing', not as it is found in the English language, but instead as a term of art. But, in that case, we must be told how to understand the term, and, at least so far as I am aware, no account is forthcoming from Merricks.

[217] The opening sections of this volume are of obvious interest, as are [Meyer 2005] and [Stoneham 2009]. [Crisp 2004] is also worthy of interest, but I think that the arguments from Meyer and Stoneham supersede it.

objects; rather, it is merely something that objects *do*. We understand this very well, I think, even if we cannot then further analyse existence, or give any account of precisely what it is that it consists in. Well, I claim that existence – this non-property that cannot be analysed – is the same as presence; the existence of an object is nothing more than the presence of an object.[218]

Note that a consequence of treating presence as existence that: '[r]eality *itself* changes in respect of its content as time passes – indeed, it is precisely in this that the passage of time *consists*' ([Lowe 2006], p.285). I think that this allows us to preserve passage as far as we need to. The first charge leveled against the standard realist was that, if we suppose that t is present, then to say that some other time 'will be present' is to say nothing more than shat t^+ is present later than t. Given EP, we can say rather more. We can say that the totality of existence changes, and that this is reflected in the fact that what exists at t differs from thay which exists at t^+ .

In response to 'Passage 2', we can then note that although we agree with the anti-realist about tense, that passage occurs in the minimal sense described, the standard realist about tense (the proponent of EP) can add that the totality of what exists changes as time passes. This is not a claim with which the anti-realist about tense can agree.

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[218] One other thought: systems of ontological categories frequently include a super-category under which all other categories fall; for instance, that of 'entity'. See [Westerhoff 2005], chapter 1, for discussion. For many such systems, the supercategory could reasonably be taken to include a tacit commitment to existence. Thus, if we are to be maximally perspicuous, the supercategory 'entity' ought to be relabeled 'existing entity'. EP, then, could be understood as the claim that this supercategory is to be understood as 'presently existing entity'. I do not offer this as a definition of EP; merely as a way of shedding further light on the thesis.

In response to Fine's question, posed in section 3.1.3 as a part of 'Passage 3', asking what we must add to a complete tenseless description of reality in order for passage to occur, we should pause. For the standard realist, a *complete* tenseless description of reality is impossible for all sentences are tensed; or so we may hink.[219] But, to say that passage occurs is, I think, to say that presence is existence and that various states of affairs will exist, and that various others have existed. This is what we should be taken to mean when we say that temporal passage occurs.[220] This, and nothing more (cf.[Tallant 2010a]).

So I think that the standard realist about tense has a perfectly sensible way in which to respond to Fine and that this serves to undermine Fine's argument against Nonstandard Realism.

Passage in Heterodox Presentism

These points notwithstanding there remains the question of whether or not Fine's Heterodox Presentism does *enough* to satisfy the demands of providing a tensed theory of passage. The view taken here is that it does not, and that this serves to undermine Fine's view. Thus, even if my preliminary sketch of a response to Fine's view ultimately fails to yield fruit, it remains clear that the arguments from passage will do nothing to motivate Heterodox Presentism.

As we saw, Fine seeks to account for passage by specifiying a number of distinct fragments of reality with each reality constituted by the absolute fact that some time is present (as well as other tensed facts). But, as Fine acknowledges, it's not at all clear how this will give rise to passage. Suppose, following Fine, that we consider the first-personal analogue of Fragmen-

[219] See, e.g. Stoneham (2009).
[220] Notice, too, that because we are treating existence as presence, and temporal passage is understood as various states *having been* the case, and various others *going to be* the case, time is very different from space. We do not, after all, think that existence is 'hereness'.

talism, according to which each fragment is constituted by the fact that some person is *ME*; that there is some person in each fragment that has the property of *ME* does nothing to give rise to a moving me, or to give rise to what we might call 'personal passage'. Indeed, I have no idea what such a thing would be.

Fine's response?

> [C]learly, something more than the equitable distribution of presentness is required to account for the passage of time. But at least, on the current view, there is no obvious impediment to accounting for the passage of time in terms of a successive new. We have assembled all of the relevant NOWs, so to speak, even if there remains some question as to why the relationship between them should be taken to constitute a genuine form of succession. ([Fine 2005], p. 288)

Fine is right: there remains a question as to why the relationship between these *distinct fragments* should be taken to constitute a genuine form of succession; but the issue is pressing, I think.

What Fine has given us is distinct fragments. But, presumably, there had better be *some* relation between these distinct fragments of reality, else we simply do not get succession from them. It would, for instance, be false to say that we can have a succession of entities that are *entirely* unrelated to one another (logically, metaphysically etc.). Now such a relation would have to be *in* neither of the fragments that it relates – it must bridge the gap between them. The first (obvious) problem is that it is entirely unclear what sort of relation is suited to relating distinct fragments of reality.

The second problem is that, even if we can locate a relation to relate the distinct fragments, it remains unclear how this relation is to suffice for passage. If we can find a relation that

will bridge the divide between distinct fragments of reality, then it seems that the relation will have to be regarded as temporal, for not just *any* relation will suffice for succession. We do not get temporal succession, for instance, simply by having two objects *spatially* related to one another: London is not, after all, "later than" Paris by virtue on the fact that it stands in a spatial relation to Paris. Only particular relations can generate temporal order. If that is right, and the relation between distinct fragments of reality *is* temporal, then presumably said relation will have to be the tenseless "earlier than" and "later than" relation, that is the fundament of the B-theory.

The result is not a tensed theory of time, so far as I can see, but a series of distinct fragments of reality, each of which is either earlier than or later than another. Now we can concede to Fine, for the time being, that it is *very hard* to pin down what we require from an account of 'genuine' passage. But that point notwithstanding, what seems highly unlikely is that anyone motivated to endorse a tensed theory of time will acquiesce to the claim that temporal passage is generated via B-relations. If the tensed theorist *did* think that such a relation – a primitive and unanalysable temporal relation that, though similar to a spatial relation, is intrinsically different – is sufficient for temporal passage, then it is hard indeed to see why they would not simply endorse the B-theory of time, and ignore Fine's animadversion on Non-standard Realism. Indeed, once we allow that these distinct fragments are all earlier than and/or later than one another, it becomes very hard to see what is supposed to be added to this by insisting that each fragment is present. If, as Fine claims, the light of presence is spread equitably throughout all time, then it is simply unclear that this is *substantively* different from anti-realism about tense.

One way in which we might respond to this argument is via Fine's claim that each of the fragments of reality postulated will overlap, an that each of them wall consist of some of the same tensed facts. Thus, as we allowed earlier on, two distinct fragments of reality may overlap in that they are both partially

constituted by the fact that 'there were dinosaurs'. This, we may say, generates the connection required between the fragments to gives rise to succession. The idea would be, I take it, that where these disparate realities overlap, this overlapping somehow suffices for these disparate fragments to generate passage.

The idea is slippery, and it is unclear how much work it can really do. But, to be maximally generous to Fine, let us consider the claim that where two distinct frag-ments of reality, F1 and F2, are both partially constituted by the very same *tensed* fact, they are a part of the same temporal sequence. Thus, if it is a part of both F1 and F2 that 'there were dinosaurs', even though very different tensed facts make up the rest of the two fragments, this shared tensed fact is sufficient to give rise to succession between the fragments. The motivation for this line would have to be that, if two fragments share *the very same fact that* 'there were dinosaurs', this somehow unites them into a single temporal sequence. In any case, here is the idea refined: where we have overlap of tensed facts (tensed facts being a part of more than one fragment) that overlap is considered *the right kind of overlap* for succession, precisely because the fact shared by the two fragments is, intuitively, temporal; where we have a temporal fact shared between fragments, perhaps we then have succession.

The trouble with such a proposal, aside from it being extremely controversial, is that these facts are insufficiently refined to act as suitable ground for true propositions about the past (and future) and when they are replaced with facts that *are* suitable, we find that the distinct fragments of reality will no longer overlap. To get clear to the nature of the problem, consider the true proposition <I was hungry five minutes ago>. This is true. However, four minutes ago I ate an apple and so sated by hunger. What I require, then, is not merely some ontological ground for the true proposition <I was hungry>, which the inclusion of the tensed fact *Jonathan's having been hungry* would supply, but ontological ground for the true proposition

<I was hungry five minutes ago>. In order to ground the truth of this proposition, it seems that we must be a little more precise with our tensed facts. Our tensed fact cannot simply be *Jonathan's having been hungry*, but must instead be *Jonathan's having been hungry five minutes ago*. But this new fact that we have postulated, that is more specific, is not one that will overlap with the fragment that constitutes how things will be in another minute's time. For, in another minute, the tensed fact that we will require is not *Jonathan's having been hungry five minutes ago*, but *Jonathan's having been hungry six minutes ago*. Thus, contra Fine, it is not the case that the tensed facts constituting a given fragment will also be a part of some other fragment of reality. It is hard to see, then, how these disparate fragments of reality are to yield passage.

A different route that might be explored is to replace the tensed facts with tenseless facts and argue that what unites F1 and F2 is that they share some tenseless fact in common that suffices for them to be considered a part of the same temporal sequence. The sort of fact that we might have in mind here is 'electrons are negatively charged' or 'bachelors are unmarried men'.

This route seems even less sensible than that which tried to generate succession from the tensed facts. The claim we were considering was that, where two different realities/fragments are constituted of the very same temporal fact – 'there were dinosaurs' – this suffices for the disparate fragments to constitute a temporal sequence. But now we are considering facts that are not tensed; intuitively, they do not seem to be 'temporal' facts, so much as entirely *timeless* facts that we would most naturally think exist (assuming we think facts exist at all) regardless of whether or not time is real. Thus, simply claiming that two fragments of reality are partially constituted by the fact that (for instance) 'electrons are negatively charged' does nothing to generate the kind of overlap that might – albeit only tendentiously – be taken to be the kind of overlap that is sufficient for succession.

4. The First Argument from Truth

Fine's first argument in which the concept of truth plays a substantial role is intended to show that the non-standard realist cannot provide an adequate account of the relationship between truth and reality and that the non-standard realist can.

Truth against Standard Realism

Fine's argument against the standard realist runs as follows. Suppose that, at some time, it is true that, 'I am sitting'. Now, take any two tokens of this, U1 and U2. It is possible to conceive of situations where U1 is true but U2 false. Yet U1 and U2 appear to express the same content, *viz* that 'I am sitting'. Fine then makes three further assumptions:

Link An utterance is true if end only if what it states is verified by the facts (in reality) *Truth-Value Stability* If an utterance is true (false), then it is always true (false). *Content stability* If an utterance states that *P*, then it always states that *P*. ([Fine 2005], p. 289)

From this Fine derives a contradiction. By the content of U1 in conjunction with the left to right implications of **Link**, it follows that there is a fact that verifies that 'I am sitting'. However, by the content of U2, in conjunction with the right to left reading on **Link**, it follows that U2 must be true ([Fine 2005], p. 290). Since one content of U2 expresses a negation of U1, we find ourselves with a contradiction.

The obvious response is just to say that the content of U1 expresses 'the conjunctive proposition that I am sitting at *t* and *t* is the present time' ([Fine 2005], p. 290). Hence, the assumption that U1 and U2 express the same proposition is false. But

Fine thinks that he can reword the argument. He states three further assumptions:

Fact It is not always the case that I am sitting *Factuality* If some facts verify *P* then those facts obtain *Conditionality* If some facts verify *P* and those facts obtain then *P*. ([Fine 2005], p. 290)

The argument then proceeds:

> By $Content_1$, U_1 states that I am sitting; and so by Content Stability, U_1 always states that I am sitting. By $Truth_1$, U_1 is true; and so by Truth Stability, U_1 is always true. By the left-to-right direction of Link, it is always the case that some facts verify that I am sitting. But then by Factuality and Conditionality, it is always the case that I am sitting – contrary to fact. ([Fine 2005], p. 291)

This favours the non-standard realist, since they have the ontological resource of another fragment to meet this problem, for they replace Link with Relative Link:

Relative Link An utterance is true if and only if what it states is verified by the facts that obtain at the time of the utterance.' ([Fine 2005], p. 295)

Since there are many fragments and thus many different tensed facts, there can be many different truths. In other words, across the different fragments of reality it is possible for U to be true *and* false by virtue of the distinct tokens U1 and U2 being true at distinct fragments of reality. By way of explanation Fine states:

> Normally there is no need to be explicit about the target of an utterance, since there is only one reality to which it can be directed. But once we adopt a non-standard form of realism, the target is no longer

exogeneously determined and must be regarded as a function of the utterance itself. (2005: 296)

Standard Realism Fights Back

As Fine rightly acknowledges, Truth-Value Stability *is* up-for-grabs; especially for the presentist. Percival ([Percival 2002], pp. 103–104) (as Fine acknowledges, fn. 22) argues that the standard realist – qua presentist – will simply argue that non-present utterances do not exist and so are not capable of being either true or false. We cannot attribute the property of truth or falsity to a non-existent (though we could reasonably say that they *had* or *will have* that property). Since Truth-Value Stability is required in order to generate the contradiction, so this constitutes a rejection of a Fine's argument.

What reason, then, does Fine give for resisting this move? In a footnote, he claims that, "[t]his [presentism] strikes me as extreme and it would be preferable if we could find a solution that was compatible with more plausible ontological views". ([Fine 2005], p. 291, fn. 22).m But what exactly is supposed to be the problem?

Fine claims that the view – to which he refers as "Ontic Presentism" – fails to make sense. Proponents of this Ontic Presensism will, Fine claims, have to define their view by saying that in is a tenseless fact that only present objects exist, and that this fails to make sense. More fully, that since "all of the facts are tenseless, it makes no sense to restrict the ontology to presently existing things" ([Fine 2005], p. 300). We can then think of Fine's argument as a two-step: first, we are obliged to give up Truth-Value Stability and so endorse presentism; second, in so doing we endorse a view that fails to make sense because presentism must be defined via recourse to tenseless resources, but cannot be so defined.

I don't think Fine should deploy this two-step. The second step (or at least the spirit of the second) argument is of as much threat to Fine as it is to presentism.

Let us think of the general problem as one of defining our view of time. Fine thinks that the Ontic Presentist requires tenseless predication and that, within this context, tenseless predication makes it nonsensical to restrict our ontology to only the present and those objects that reside herein. Now re-call that Fine's view is that there *are* many distinct fragments, each containing consistent tensed facts. The reason for the italicization in the sentence preceding this one is obvious. There are three readings we could give of Fine's view.

(F1) There are-now many fragments of reality
(F2) There have-been and will-be many fragments of reality
(F3) There are-tenselessly many fragments of reality

F1 is not Fine's view. Each fragment consists of consistent tensed facts. Thus it is simply false to say that, now, there is more than one fragment of reality. The term 'now' serves to pick out what is the case at *this* fragment, according to Fine.

F2 fails for similar reasons. At no individual fragment is there more than one fragment of reality. One could try to aug-ment **F2**: perhaps the trouble is that we can borrow a quantificational device – that of a span operator (an operator that quantifies over plural times and/or realities) – call this WERE and use this to help us. We can then say,

*(F2)** WERE: many realities.

I have two objections to this strategy. First, it is not entirely clear now that this serves to differentiate Heterodox Presentism from Lucretian Presentism, LP.[221] LP is a version of presen-tism according to which 'the world' instantiates many distinct

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[221] See, e.g., [Bigelow 1996].

past and future tensed properties, such as *having contained dinosaurs*. These tenses properties then serve to ground our talk about the past and future. Notice, then, that according to Lucretian Presentism at each time the world instantiates all of the consistent tensed properties. LP, thus, is alarmingly similar to Heterodox Presentism. There were many times, each consisting of the world instantiating a different set of tensed properties. Since the presentist will have to find some means of quantifying over spans of past-times[222], the proponent of LP can, thus, agree with Fine: there were many times, each consisting of sets consistent tensed facts. But Fine does not mean to endorse LP, I think.

Second, though clearly related, there is a sense in which Fine seems to want to say rather more than merely (for instance) that there *have been* many fragments of reality. The clear implication of **F2** is that reality *has been* fragmented. There seems to be no idea present in Fine's writing that there are (*sub specie aeternitatis*) many fragments of reality, and that view is certainly not captured by saying merely that there *have been* many such fragments.

Indeed, the best way in which we capture this sort of insight is via **F3**. The trouble with this is two-fold. First, it is not entirely clear that our language admits of tenseless sentences (e.g. [Meyer 2005]; [Stoneham 2009]). If that's right, then Fine's view *cannot* be defined using **F3**. Second, if **F3** *is* the right definition then it then turns out (I think) that it is a tenseless fact that each of these fragments is present (at itself), for it is a tenseless fact that each of these fragments exist and a further fact that each of the fragments is present at itself. Passage, by Fine's own lights, is not a tenseless fact for the tensed theorist, as we saw above. So, if **F3** is the correct definition of Heterodox Presentism, then I don't see how Fine can preserve passage.

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[222] See, e.g., [Brogaard 2007]

Let me conclude this section by noting that in defining the view of presentism that I tentatively sketched above, EP, I make no mention of tenseless facts. Indeed, when explicating the view I was at pains to note that all sentences are tensed, and that the presentist thesis should *best* be regarded as consisting in the explicitly tensed claim that existence is presence. As a consequence I see no reason so think that there is any concern for EP and, if we can properly describe EP as a species of Ontic Presentism, so there is no problem for a particular species of Ontic Presentism.

5. The Second Argument from Truth

There is another issue, however, that we might use to motivate an argument *against* ontic presentism – as Fine refers to it – and this turns on the question of whether or not to adopt **Link**. As a reminder, this is the principle that:

Link : An utterance is true if and only if what it states is verified by the facts (in reality)

Presumably, we can substitute **Link** for some principle that is neutral as to the fundamental constituents of reality, as opposed to presupposing a fact ontology. This,

Link* : An utterance is true if and only is what it states is verified by what exists (in reality)

This principle, **Link***, is of course tantamount to a truth-maker principle according to which every truth requires some existent in order to be true. Now what is clear is that a view such as presentism is going to find it very difficult indeed to accommodate **Link***; simply, there are no non-present existents that will serve to verify/make true claims about the past and/or the future.

So what scope is there, if any, for the presentist to deny that there is the kind of intimate connection between truth and existence that Fine (and similarly minded truth-maker theorists – e.g. [Armstrong 2004]) has suggested? The answer to that question, of course, may well come down to a matter of what we think it is for a sentence, utterance or proposition to be true.

For the remainder of this paper I want to argue that there is a plausible account of truth that does not commit the presentist to the existence of entities to verify/make true their talk about the past; that they should adopt this, and that this blocks Fine's argument.

Link* and the Theory of Truth

Here I propose that the presentist should do two things: first, they should concede that there is a fundamental difference in what is required for a proposition about the present to be true and what is required for a proposition about the past or future to be true.[223] Second, they should exploit this. It seems wholly intuitive to think that a proposition about the present requires the existence of what it describes in order to be true. <The cat is on the mat> can surely be true only if the cat exists, the mat exists, and the cat is on the mat. To coin some terminology: such propositions are existence entailing. In contrast, the presentist does not (or should not) think that truths about the past require anything similar of us. The proposition <there were dinosaurs> should not be regarded as existence entailing. Of course, the presentist well concede that such propositions will be true only if particular objects – dinosaurs – *did* exist. We should grant them that. But the presentist is obviously obliged to take the view that there is a fundamental difference between existing and having existed.

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[223] I mean, here, to be discussing contingently true propositions that are about concrete objects.

Nonetheless, there is a clear sense in which we should want truth to be singular and univocal. Thus, if the presentist wishes to both have their cake and eat it, they should endorse what [Lynch 2009] (p. 73) dubs 'the functionalist theory of truth'. Regrettably I only have space to sketch the view here.

Let us begin by noting that there are a number of truisms that any theory of truth must preserve: e.g. if <p> is true and believed then things are as they are believed to be; other things being equal it is a worthy goal of inquiry to believe that <p> if <p> is true; it is correct to believe <p> if and only if <p> is true.[224] and so on.

We can then say that:

(F) ($\forall x$) *x* is true if, and only if, *x* has the property that plays the truth-role. ([Lynch 2009], p. 73)

The thought is that in different domains different properties may suffice to play the truth-role. In ethics, then, we might not take the view that propositions expressing moral or ethical judgment must correspond to reality – to some moral fact – in order to be true; perhaps they merely have to satisfy some other condition to be true as they are within the domain of moral discourse.[225] Whatever this other property, the having of this property fully suffices for the playing of the truth-role.

The property that the presentist should insist on is the property of 'accurately describing what was the case' (in the case of talk about the past).[226] If a proposition about the past has this property, then the proposition has a property that plays the truth-role within the domain of talking of the past. The proposition is, then, true.

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[224] [Lynch 2009], p. 72.
[225] In lieu of this, Lynch discusses the prospects of 'concordance' ([Lynch 2009], p. 176.
[226] Cf. [Tallant 2010b].

Does the concept of 'accurately describing' commit the presentist to ontological ground? One might think so if one thought that an accurate description of reality required reality to match up to what is said in some kind of correspondence relation.

I lack the space to explicate in any kind of serious detail what is meant by 'accurately describing'. But the essence of the view is simply this: according to the presentist, a claim about the past describes something having existed, but that does not in fact exist. If 'it there were dinosaurs, but they are no longer' is true, then it's true because: (a) dinosaurs did exist; (b) dinosaurs are no part of reality. I take it that this is intuitively obvious. If a sentence truthfully describes reality as not including some entity then by far and away the most obvious explanation of the sentence's truth is that reality does not include the entity in question; if a sentence truthfully describes some entity as having existed, but not still existing, then the most obvious explanation of the sentence's truth is that reality included, but no longer includes, the entity in question.[227]

One putative advantage of taking this route is that we can sensibly preserve the claim that some truths require truth-makers; but not all. If, for instance, we took the view that having a truth-maker just is what it is for a proposition to be true then this claim about truth would rule out presentism (assuming that we also deny that there are truth-makers for true claims about the past). Likewise, if we thought that truth is correspondence, and thought that there were no past objects to which past-tensed propositions could correspond, then that might serve to rule out presentism. And both of these theses might seem to be well motivated by appeal to clear cases where we *do* think that truths depend upon what exists: <the cat is on the

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[227] For *similar* views see [Sanson and Caplan 2010] and [Lewis 1992].

mat> requires ontological ground in order to be true; it would be deeply counterintuitive to think otherwise.

But, if we adopt Lynch's functionalist theory of truth, then we have a way in which we can satisfy these seemingly disparate intuitions. Truths that fall within some domains will require ontological grounds; truths from others will not. Since this is precisely what the presentist wants to say, I think that they should endorse this view – or some similar variant.

6. Relativity

It is a striking feature of the paper that I have, so far, ignored what we might take to be one of the strongest arguments in favour of Fine's position: that the view is compatible with the Special Theory of Relativity. Heterodox Presentism is consistent with STR precisely because it does not privilege the existence of any one set of tensed facts over any other. Thus, we do not have to pick one set of tensed facts and stipulate that this set of facts is 'now'. Since STR is typically taken to deny the existence of such a 'now', this is a good-making feature of Fine's view.

My reasons for not discussing the objection are simple: Fine's view, as we have seen, does not preserve temporal passage. That is, it does not preserve temporal passage over and above that which is provided by the tenseless theory of time, nor does it privilege any one time. Again, much like a tenseless theory of time.

Now the tenseless theory of time is consistent with STR; it is consistent because it posits no passage and no privileged present. In that case, Fine's view is nothing more than a variant on a tenseless theory of time. There are [tenselessly] many distinct fragments. Each of them 'exist'. It is very had to see this as anything other than a variant of the tenseless theory of time.

Thus, the reason that Heterodox Presentism is consistent with STR is that it is simply a form of the tenseless theory of time. That it is not so described by Fine's own taxonomy is not threatening to my point. Unsurprisingly, I don't think that the taxonomy accurately reflects the structure of the logical space. Fine's view is tensed in name only; in spirit it is tenseless. No tensed theorist of time should be tempted by this view. Compatibility wish STR view may, of course, be a virtue of Fine's view – but it is an unsurprising one.

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A Real Present without Presentism

Yuval Dolev

1. Introduction

Priests of the Present, as they may be called, have been promising us for millennia, in many languages and cultures, in popular form but also in some of the profoundest texts, that the present is the gateway to heaven. The art of living, according to both Epicureans of then and Buddhists of now, consists crucially of living in the present. Kierkegaard and the young Wittgenstein point to the present as the site on which one brushes with eternity.[228] And in popular self-help manuals and psychological internet sites, one is presented with easy techniques for meshing one's life with the present moment.

Celebrators of the present moment are usually either oblivious to or dismissive of a rival crowd, which has been amassing followers at an increasing rate, recruiting its disciples from among philosophers and philosophically inclined scientists. This camp is united in denying that there even is such a thing as the present. Prompted by a number of powerful arguments that have emerged in the previous century, more and more philosophers are accepting that the division of events into past, present and future has to do with how we apprehend reality but not with how things really are. In reality, it is claimed, events do not possess these tensed attributes, that is, they are neither past, present nor future. Indeed, it is quite common nowadays to hear various authorities quoting Einstein's declaration

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[228] See [Wittgenstein 1961], 6.4311; [Kierkegaard 1979], p. 89.

that the distinction between the past, present and future is merely an illusion.[229] If we think of time's passage as the becoming of future events present and then past, then the denial of the reality of tense amounts to a denial of the reality of time's passage.

The standoff between those who insist that some events are present in reality, and not merely in our apprehension of reality, and those who insist that reality is tenseless is familiar to anyone acquainted with current literature in the philosophy of time. In this paper, I will focus on the debate between presentists and B-theorists. In a nutshell, presentists hold that only what is present exists. B-theorists argue that all events are ontologically equal. It is often supposed that the two doctrines are jointly exhaustive, and so that one must chose: either only what is present exists or else all events, regardless of their temporal location, exist tenselessly. In part 1 of the paper I will explain why I do not accept this forced choice, and argue that a third option can be conceived, in which tense is part of reality, but is not what presentists take it to be. In other words, I suggest that presentists are correct in insisting on the reality of tense, but B-theorists are correct in rejecting the presntist's conception of tense. In the alternative I put forth in part 2 of the paper, tense is analyzed not ontologically, but phenomenologically. In the course of clarifying what this means, I explain why, despite the reliance on phenomenology, the alternative I advocate should count as a form of realism about tense.

2. Part 1

The current debate in the metaphysics of time was initiated a hundred years ago by McTaggart, who purported to show that the notion that reality is tensed, namely, that each event is either past, present or future, harbors a logical inconsistency. Briefly and crudely, McTaggart argues that once we admit that an event has one of these tensed attributes we admit to its having all three, and demonstrates that the fact that an event does not have all three at

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[229] [Einstein 1989].

one time but in succession does not dissolve the contradiction but rather multiplies it.[230] Mellor's rendition of McTaggart's argument makes the contradiction even more evident. Mellor claims that if we insist that tense is real and that present states of affairs are the truthmakers for tensed sentences, then, given that with time's passage different states of affairs become present, the truthmakers of sentences change with time, the result being that one and the same token of a tensed sentence is both true and false.[231]

Another argument against events' being past, present or future is grounded in the supposition that only what can be described non-perspectivally can count as a constituent of objective reality. Again, very sketchily, if the description of something is inescapably perspectival, that is, changes according to one's position, then there must be something subjective about it. Hence, the American Revolutionary War is an ob-jective fact, but its being past is not, since its pastness depends on one's location in time: from our perspective it is past, but it was an ongoing present affair when Paul Revere set out on his midnight ride, and it was yet future during the Boston Tea Party.

Finally there is an argument from relativity theory, which seems to give scientific, empiric clout to the denial of the reality of tense. Famously, simultaneity is a frame-dependent relationship in relativity theory. This entails that whether a distant event is past, present or future will depend on facts about the frame of reference from which this question is being posed. To put it somewhat pictorially, relativity theory gives rise to the possibility that one and the same distant event will be judged to be past, present and future by three moving observers that intersect at the same location at a given moment. Yet observers who are looking at an event from the same place in space and time should not disagree on whether it is

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[230] [McTaggart 1908], p. 469. Of the numerous places in which McTaggart's argument is expounded, a most recommended one is chapter 7 in [Mellor 1998].
[231] [Mellor 1998], p. 82.

happening or not, that is, on whether it is present or not, and so the conclusion seems to follow that it is neither.[232]

Without engaging in the deeper study each of these arguments requires, let me just mention that for many, these arguments are convincing enough to warrant a revolution in their view of reality, and an acknowledgement that, contrary to our initial intuitions, time's passage is an illusion and events age not tensely located, that is, they are neither past, nor present nor future.

Presentists find this denial of the reality of tense unacceptable. Tense and passage are too ubiquitous and too fundamental to be removed from our view of reality. The response to the above B-theoretic arguments, they claim, has to come in the form of a theory that is immune to them, and that provides a solid metaphysical framework for tee basic tenet that only present events are real, or that only they exist.

A major complaint filed by B-theorists against presentists is that the latter give too much weight to language, and that they commit the fallacy of reading ontology from everyday discourse. That tense figures inevitably and, irremovably in language as uncontroversial. But this fact does not establish the reality of tense, argue B-theorists. One cannot make inferences from everyday language to claims about the fundamental structure of reality. To caricaturize the fallacy, imagine that upon hearing me exclaim "what the devil are you doing?" my son learns, not that I disapprove of his creating added motivation not to fail his juggling practice by using for the purpose uncooked eggs, but that the world is actually populated with devils. "The same mistake . . . is being made in much subtler ways in respectable metaphysical disputes"[233], claims

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[232] That tense cannot be part of "a complete description of reality" is explained in an unpublished manuscript by Derek Parfit ([Parfit ms.]). The argument from relativity was first presented by Putnam in [Putnam 1967]. All three arguments are elaborated in my [Dolev 2007], chapter 2.

[233] [Dyke 2008], p.3.

Heather Dyke, referring specifically to the dispute in the metaphysics of time.

Here it is worth noting an important transformation that the B-theory has undergone over the last few decades. From when it was first put forth, the idea that time's passage and the distinction between the past, present and future are illusions was perceived as clashing quite violently, not only with language, but with experience and with our intuitive grasp of reality. True, the B-theory which entailed these counterintuitive claims seemed to be sustained by a powerful logical argument, McTaggart's, and by one of sciences greatest achievements – relativity theory. But the clash with language and experience was troubling all the same. Originally, inquiries were made into the possibility of "translating" tensed language into a "tenseless" one, that is, of either reducing or eliminating tense. These efforts failed. But an alternative way to alleviate the discomfort was found. The new proposal was to square language and experience with the B-theory by showing how tensed sentences and tensed beliefs could be made *true* by tenseless facts.

Nowadays, many B-theorists accept conceptual relativism. According to this doctrine, the facts of reality can have different descriptions that are not inter-translatable yet are all true, and, more importantly, are all underpinned by the same facts and the same set of existents. Physicalism is often invoked as exemplifying this phenomenon. A physicalist does not have to deny the truth of sentences about tables or about the beauty of sunsets. Nor is she obliged to translate these sentences into those of physics. All she needs to do is establish that these sentences can be made true by the things that physics tells us exist. The so called new B-theory relies on conceptual relativism for explaining how tensed sentences can be held as both true and irreducible to tenseless ones, while being made true by tenseless facts.

The moral to draw from this brief history of the B-theory's evolution from its old to its new version is that for B-theorists ordinary language is anything but unimportant or philosophically inconsequential. Both old and new B-theorists invest effort and

ingenuity into negotiating their doctrine's relationship with language. There is a good and simple reason for this: a doctrine that clashes with language risks being utterly misunderstood and even dismissed as incoherent, for it is only by means of the language available to us that we can so much as attempt to comprehend it. After all, B theorists are not putting forth a skeptical thesis. In contrast with the skeptic, whose aim is to shake us rather than get us to actually alter our view of reality (stop believing that there are cars and birds), B-theorists do want us to re-conceive time and to accept, as claims about the world, the unreality of time's passage and of the distinction between the past, present and future. Since they have a different objective from the skeptic, B-theorists do not want to be susceptible to the standard accusation directed at the skeptic, namely, that his thesis is incoherent because it is stated in a language the possibility of which undercuts his hypothesis. To the contrary, it is highly important for B-theorists to be understood and thus to avoid breaks with language and experience.

Hence when B-theorists attack presentists for relying on language, their protest is misdirected. B-theorists, like presentists, acknowledge the importance of being attuned to language in the course of philosophical inquiries. They too must rely on language in the course of investigating what there is. That the recurrent employment of "devils" in discourse does not attest to the existence of devils is not something anyone would dispute. But then there aren't many who would insist that we know about electrons independently of how "electron" is used. The same could probably be said of "before" and "simultaneous with", key terms for the B-theory. The question of when it is legitimate to read ontology from language is a complicated one, but it is not relevant, insofar as criticizing presentism is concerned. The problem with presentism is not that it reads ontology from language, but that it reads into language ontological theses that are not there, and specifically, the thesis that only present things exist or are real.

Indeed, nothing in ordinary, philosophical or scientific language tells us that only what is present exists. What language and experience tell us is that there are significant differences between

the past, present and future, differences which we will attend to in the second part of the paper. Language and experience do not tell us that these differences are ontological. Not that it is always wrong to say that only what is present is real or exists. This formulation may indeed be used poetically, or as a heuristic device, as a phrase that captures in striking form the significance of the difference between events that are present and those that are not. But it cannot be taken literally, as depicting some ultimate ontological fact, or as stating some final verdict on the question of what there is.

To summarize, the problem with presentism is not its reliance on language. From relying on language there is no escape, nor should we seek one. The problem is its imposing on language more than we can find in it. The problem with B-theoretical attacks on presentism is that they misidentify their target. The validity of the arguments against tense deployed by B-theorists is restricted to their attack on the metaphysical doctrine that only what is present exists. But there is nothing in these arguments to shake the role tense plays in our understanding and experience of the temporal aspects of reality.

I will say more about how tense survives B-theoretical attacks in a moment, but I want first to claim that in fact B-theorists commit the same error as their rivals. As just noted, B-theorists, no less than their rivals, are intent on refraining from conflicting with language. That's why at the heart of the new theory are found semantic devices that tenselessly account for the truth of tensed sentences. Yet, just like their presentist counterparts, they impose on language elements that it cannot tolerate. Let me explain.

B-theorists are committed to two theses. The first is negative - they reject the maxim that "only the present is real", or that "only present things exist". They reject the ontological hierarchy that renders present things and events superior in some way to things that are not present. The second thesis is positive and states that all events are on an "ontological par". This thesis is often fleshed out as a semantic theory, namely, that the truthmakers for all proposi-

tions are tenseless truth makers. Folded into this formulation is the theory's sweeping denial of the reality of tense: if there is no need to resort to tensed truthmakers for the sake of accounting for the truth of tensed sentences, then there is no need to insist on the existence of tensed facts.

B-theorists take these two theses to imply each other. If present things are not ontologically elevated with respect to things that are not present, then all things are on an ontological par, a claim which in turn is assumed to be tantamount to denying that in reality things are past, present or future. I don't know if the superficial kinship between "real" and "reality"[234] is partially responsible for the thought that denying that "only present things are real" entails accepting that "in reality nothing is past, present or future". It is a fact, however, that they are regarded as analytical opposites, so much so that for B-theorists establishing the latter requires no more than refuting the former.

This, however, is a mistake. The negative and the positive theses are not equivalent. Rejecting the notion that present events are "ontologically superior" is not tantamount to accepting that there are no real differences between being present and being not present. Indeed, the alternative I will propose in part 2 consists precisely of the claim there are real differences between being present and being not present, only they are not ontological, and so are not captured by the main tenet of presentism.

I believe we ought to fully embrace the B-theoretic arguments against presentism and discard the claim that only what is present is real, or exists, but we must just as vehemently disallow the B-theoretic alternative that denies the reality of tense. The flaw underlying both doctrines is the same: it is the thought that tense is an ontological matter, and that the elucidation of tense must come in the form of ontological theses involving ontological comparisons. Presentists think present events are ontologically superior to those

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[234] I say superficial because in other languages, Hebrew, for example, it does not exist.

that are not, B theorists think all events are ontologically equal. The problem, however, is not with the outcomes of such comparisons but with the thought that such comparisons uncover the nature of tense. And, to repeat, language and experience do not support the appeal to such comparisons, nor do they provide the means for executing them.[235] By supposing that language can be reconciled with the claim that all events are on an ontological par, B-theorists are committing towards language a transgression that is similar to the one committed by presentists.

I hope it is clear now why I said above that tense can survive B-theoretic attacks on it. B-theoretical arguments fall into two categories. One consists of "proofs by negation". Thus, the argument from relativity theory starts off with the assumption that only what is present is real and leads to a refutation of this assumption, which is taken to be tantamount to proof for the correctness of the B-theory. Mellor's rendition of Mctaggart's argument also leads to a contradiction from the assumption that only present facts are real. In the other category we find arguments that make, usually hidden, tenseless assumptions, and thus beg the question against tense. McTaggart's original argument is of this kind. McTaggart situates us on various locations along the timeline and invites us to determine an event's tensed attributes from them. But for us to inhabit these different temporal locations they have to tenselessly exist[236]

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[235] This has to be qualified. When an attempt is made to metaphysically account for tense, the thought that the present is "ontologically superior" to the past and the future is a natural hypothesis. It almost unavoidably arises from reflection on the phenomenological differences between present things and those that are not, and specifically, on the fact that only present things can be experienced. The crude intuition that distinguishes the present can drive a theory, such as presentism, in which it is turned into a fundamental tenet of metaphysics. The theory is then countered by the thesis that all events are on an ontological par. That's how ontological comparisons emerge. My point is that they are not part of language, and that they are ultimately indefensible.

[236] These comments obviously do not constitute an adequate critique of the different arguments in ques-tion.

Much confusion is due to the fact that care is not always taken to separate presentism from tense, the maxim that only what is present is real from the contention that there are real differences between being present and being not present. As a result, arguments of the first category, which effectively undermine presentism, are taken as having established the unreality of tense. Arguments that are not directed at presentism but against tense in general are of the second kind, circular and thus invalid. When the hidden presuppositions of the different arguments are not unearthed and when the difference between presentism and other forms of conceiving tense are not made explicit, it is almost impossible not to take the refutation of presentism as equivalent to the establishment of the unreality of tense. However, a conception of tense that does not explicate tense in terms of ontological comparisons will be immune to B-theoretic arguments of both kinds.

Presentism is just one way of analyzing the reality of tense, and not the one we ought to adopt. My proposal is to remain faithful to the fundamental fact of experience that some events and experiences are present while others are not, but to relinquish both the ontological fairytale this truism is couched in by presentists, as well as the B-theoretic myth that the world is a frozen block consisting of unchanging tensless facts. Tense and passage are real, as opposed to illusory. They pertain to real events, and do not merely reside "in our heads". In particular, it is a feature of reality, not merely of our apprehension of reality, that some things are present. But, while this involves real differences with things that are not present, the differences have nothing to do with "ontological hierarchies" and so nothing to do with only present things being real. Let us go on to see what these differences are about.

3. Part 2

Let se introduce my alternative to presentism by answering two simple questions:

1. Which of the many events that make up the world's history are present?

2. What distinguishes present events from those that are not present?

My answers to these questions will certainly make it look as though what I am about to propose is as far from realism about the present as a position can be. I will soon correct this misimpression.

In telegraphic form, the answers are:

1. For me, present are those events that are co-temporal with my present experiences. You grasp the presenteess of events via the presentness of your firsthand experiences.

2. Present events are distinguishable from those that are not by being *experientiable*.

The difficulties with these responses are evident. To begin with, the answer to the first question seems circular: it says which events are present by referring to a group of present events one's present experiences. Then, it raises questions about past events (with the suitable modifications, analogous questions can be phrased about future events): is their presentness also tied to that of human experiences? If so, how does this answer differ from that of B-theorists, who agree to the tautology that events are present when they occur? And what about the bizarre consequence that seems to be entailed by the first answer, namely, that presentness did not exist prior to the appearance of experiencing human beings? Finally, how can this conception, in which evidently experiences, one's first-hand experiences, play a crucial role, be the basis for realism about the present? How can a conception of the present that is so individual, so perspectival, claim to be of a real, "objective", present?

Let's delve more deeply into the answers and try to meet these challenges. Starting with the circularity worry, for X present events

are those that are co-temporal with X's present experiences. The circularity worry dissolves, obviously, if the presentness of X's firsthand experiences is accounted for in a non-circular manner, or if the presentness of X's firsthand experiences requires no further accounting. A somewhat hackneyed analogy can illustrate the point. You can explain to a child what a meter is by pointing to a meter long table, or, better, by instructing the child how to measure the table with a ruler. But if the child is inquisitive he may press you on the "meterhood" of the ruler. He may demand assurances that the particular ruler you are using is accurate. The only real remedy to this pestering would be to take him to Paris and show him that the ruler is the same length as the standard meter rod. If that does not appease his doubts, you will be at a loss. You may try explaining that the standard meter rod is one meter long "by definition", or that it is an "analytic truth" that it is one meter long, and other explanations. As we know from the substantial literature this case has occasioned, each of these answers encounters problems of its own.

I think that an acceptable way to circumvent the demand for an account of the standard "meterhood" is to point out that the understanding that this rod is one meter long is a precondition for possessing the term "meter", and so for asking questions pertaining to the rod's length in meters. The very act of querying whether the standard rod is one meter long already assumes an understanding that it is, for without such an understanding one does not have at one's disposal the term "meter", as it figures in the question. Similarly, for each person, an understanding that one's experience is present is a precondition for possessing the term "present", and so for asking questions about the tensed location of one's experience. The very act of querying whether an experience one is having is present presupposes an understanding that it is. One's firsthand experiences figure as *temporal standards* to which tense terms, specifically the term "present", are anchored.

Hence, when to the question "which events are present?" one answers "Those that are co-temporal with my experience", one is not answering more circularly than one does when pointing to a

rod in Paris in stating why some object is one meter long. There are, of course, obvious differences between the Paris rod and one's firsthand experiences. The standard meter rod's existence, unlike that of human experiences, does not depend on the existence of human beings. It can be imagined surviving the extinction of the human race, and also preceding it. Also, the rod is a single, public object while experiences are many and private. Moreover, their multiplicity is twofold: not only do they change from person to person, each person witnesses them changing with time's passage.

These are indeed differences. But they are less consequential than may first appear. Being a standard is not an inherent property of any object. A rod becomes a standard by a human act, which is just as dependent for its existence on the existence of human beings as are human experiences. What is important is not the existence of the object, which indeed may precede and succeed the human race, but the existence of the standard, which entirely depends on the object being made into a standard by human beings. As for our so called "presentness rods" being many and private, these facts as well do not undermine their role as standards, that is, as things with respect to which presentness is given but whose own presentness cannot be posed as something in need of an account. The twofold multiplicity they exhibit is due to there being many people, and because there are many events which, in succession, become present after having been future and before becoming past. There is nothing about these facts to block each of our firsthand experiences from fulfilling, for the duration of its transpiring, the role of a "tense standard", that thing to which our grasp of presentness is anchored. Nor is their privacy an issue: we can readily come to agreements as to which events are present, even though we each rely on our own standards. Such an agreement is indeed secured by the fact that events and their properties, including their tensed properties, are public (imagine a group of people agreeing that some object is warm, each relying on the sense she gets upon touching it).[237]

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[237] To elaborate on these points a bit, in the spatial case it is quite obvious that a multiplicity of standards does not block the possibility of agree-

What about the presentness of events that predate the emergence of human beings? There was a time when dinosaurs roamed the face of the earth. That era is now past, but was it ever present? There were no humans to experience it, events involving dinosaurs were never co-temporal with someone's experience. However, each of us, through her own firsthand experiences, understands presentness and possesses the concepts and language with which to refer to it. Specifically, each of us can employ tense concepts and terms to say of past events that they were once present. Reverting again to the above analogy, at the time of the dinosaurs the distance between the earth and the moon was 300000 kilometers, though the standard meter did not exist yet (the rod could have existed, but not the standard). The standard does not fix distances, yet it's only through a comparison with it that distances in meters are given to us. We take the term "meter", which is inextricably linked to a humanly fabricated standard, and use it to speak about facts that obtained in pre-human times. We do the same when we employ the term "present", which is inextricably tied to human experience, and use it to speak about events in pre-human times as having been present. For an event to have been present it did not have to be co-temporal with someone's experience. Nor will future events have to be experienced to become present. Nor, for that matter, do present events have to be experienced in order to be present. But for us to say of events that they were, are, or will be

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ment. Imagine two cultures that independently establish length standards. They can still come to agreements, for example, when trading goods, by communicating. Likewise, communication can facilitate agreement concerning the tensed properties of events, even if these are grasped in relation to numerous, private, standards. Also, note that length standards are replaced from time to time. In the temporal case, they change, not due to human deliberation and convenience, but because with time's passage present events stop being present and new events become present. Our standards have to be updated, as it were, to keep up with this transition. Old standards are left behind and new ones come into play. Noting this gives us no reason to question our experiences' role as standards. It merely highlights the intricacy of the scheme within which they fulfill this role.

present we need the term "present", which is given to us only through the presentness of our firsthand experiences.

One more clarification. There is a sense in which B-theorists may take the above as actually vindicating their position. For what has been said can easily be read as merely stating the triviality that any event is present at the moment at which it occurs. Mellor, for example, points out that if we ask for the tensed locations of an experience that is co-temporal with the asking of the question we tautologically answer that it is occurring now.[238] To put the point differently, it may be objected that the answer given to the question "Which events are present?" concedes what B-theorists have been claiming all along, namely, that "now" is like "here". Events occur "now" when they occur, just as they are "here" where they occur. Just as I am now hearing my next door neighbor practicing her trumpet here in Jerusalem on April 28, 2011, so my cousin is hearing her next door neighbor practicing the tuba there in Manhattan, and my great grandfather is hearing his next door neighbor practicing the fiddle, there, in April 28, 1900. There is nothing special about Jerusalem, it's "here" for me but "there" for my cousin, and vice-versa. Likewise, there is nothing special about April 28, 2011. It's "now" for me but "then" for my great grandfather, and vice-versa. "Here/there", "now/then" are useful linguistic devices, but are subjective in the sense of being perspectival, and say nothing about real properties of events.

There are two problems with this objection. First, the B-theoretic conception of presentness at each moment t, present are those events occurring at t -entirely obliterates tense and passage, which are pivotal in my proposal. There is an obvious asymmetry between me and my great-grandfather: I belong to his *future* while he is in my *past*. It's not that each of us is "there" for the other, as is indeed the case with the spatial "there". True, for each of us, the other's experiences, and the events that are co-temporal with these experiences, are not present. But while spatially there aren't different ways of being "there", temporally, there is all the difference in

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[238] See [Mellor 1998], pp. 44–45.

the world between being past and being future, which, unless we are to beg the question in favor of the B-theory, cannot just be ignored. An account of this difference is beyond the scope of this paper. Let me just say that, like presentness, it cannot be fleshed out in ontological terms, nor can it be reduced to the "tenseless" before/after dichotomy. Rather, as I will shortly explain with respect to presentness, it must be derived from phenomenology, from how our rational and emotional dispositions towards an event depend on whether the event is past or future. Tautologically events are indeed present when they occur. But they differ significantly, for those that have occurred are in the past of present ones, but those occurring are in the future of those that have occurred.

Something stronger can be said. As was observed above, the assertion that events are present when they occur entirely represses tense, the "are" which is used in stating it being "tenseless". But in fact there is no way for us to actually think about events tenselessly. My grandfather heard his neighbor's violin a hundred years ago, and much as I would like to think about that event tenselessly, its being past is not something that can be peeled off of it. A "tenseless" "are" is simply not something we possess.

Matters get clarified further when we look more closely at the comparison between "now" "here". There is a fundamental difference between "now" and "here" which should be illuminated both metaphysically and phenomenologically. Starting with metaphysics, the comparison between "now" and "here" tacitly invokes the supposition that the sounds around my grandfather and those in my vicinity are "equally real". The correct observation that there is nothing special about the events of my time, that they are not "more real", or "ontologically superior", to those of my great-grandfather's times, is taken to be tantamount to the incorrect contention that all events are "equally real". This contention comes into play when we travel with our imagination to "over there", as it were, and hear those fiddle sounds, as though we were back there, with our great grandparents, partaking in their present. Performing this thought-experiment may get us to suppose that things are happening "there", in the temporal sense, in the same way as they are

happening there in the spatial sense. June 1900 is just as "there" as Manhattan is, the events of June 1900 and those occurring now in Manhattan being taken to be "equally real" as those I am experiencing here in Jerusalem now, on April 28, 2011.

But the point stressed in part one of the paper was that just as it is misguided to speak of "ontological superiority", it is misguided to speak of "ontological equality". Once again, ontological comparisons simply do not pertain to tense. In particular, it cannot be asserted that my great grandfather's "presentness-rods" are "just as real" as mine. They are past, which does not render them "less real", but does render them inaccessible in a way that current events in Manhattan are not. The misguided thought that "only the present is real" arises from the utter inaccessibility of past and future events. The correct way to go about investigating tense is to accept this inaccessibility as the basic feature from which the inquiry departs, but to shun all ontological statements that are supposed to underpin and account for it. A corollary of this shunning is that past events are not "equally real" as present ones. And this observation undercuts the B-theoretic attempt to conjoin "nowness" with "hereness". Thus, to the observation that our experiences were future for our great grandparents while theirs are in our past we add that theirs are not "equally real" as ours, and, in contrast with events in Manhattan, are not happening "there" (and note again how grammatically skewed the attempt to make the "now" into a kind of "here" is: we find ourselves speaking of past events as "happening there", rather than as having happened then).

Shifting our focus to phenomenology, let us return to an observation made above concerning the differences between "here" and "now", namely, that our experiences share the temporal, but not the spatial, properties of the experienced. This feature of our experience, rather than render the present "experience dependent", enables us to realize the contrary, namely that the temporal properties of events are also properties of our experiences of these events. In contrast, our experiences do not share the spatial properties of the events experienced. In fact, it is quite odd to speak of our experi-

ences as having spatial properties at all (even if we identify experiences with brain processes).

That the presentness of our experiences is also the presentness of what we experience puts presentness together with other properties of the experienced, as something that is, as it were, given to us, and that has nothing to do with our tastes, preferences, and decisions. This "being given to us" of the "now" manifests itself in another significant way, namely, in the fact that we cannot return to what was present and is now past. This is another difference between "here" and "now". We can return here but not to what was present. We can return home, but not to last night's dinner. In general, one can occupy the same place twice or more, but events are experienced only once. It is wrong to compare "now" to "here". Rather, if we seek a spatial analogue, "now" is like "meter", and is no more subjective than "meter".

To summarize, my proposal differs from a B-theoretic conception of presentness in that it stresses the importance of the difference between the past and the future, regards the present as given, and conceives "now" as phenomenologically and metaphysically different from "here", and specifically, as not sharing its subjectivity.

These points are further illuminated when we move on to the second question posed above, namely, what differentiates present events from those that are not. Presentists are right to insist that the present is special, but they are wrong in their view of what makes it special. Its being special does not consist in its being "more real" or "ontologically superior", but in its being *experientiable*. We can only experience present events. Being experientiable is a property things that were future attain as they become present and lose when they pass on to the past. Things do not have to be actually experienced when they become present. And they may remain outside the realm of what can be experienced they may be too small, buried too deep under the ground, be too far, etc. But insofar as time is concerned, they attain a temporal feature that makes them experientiable, that is, they become present. By becoming spatially pre-

sent an object or an event attains nothing. "Hereness" amounts to no more than being in a certain spatial relationship to someone, and certainly does not condition experience there is no context in which the sun which I am now experiencing can figure as being here. "Presentness", in contrast, has nothing to do with being in a temporal relationship to someone and completely conditions experience. In fact presentness consists of events' gaining the property of being experientiable.

That only present events can be experienced is completely obvious with respect to pains, for example, but quite obvious with respect to other events as well. A lunar eclipse or the passing of a comet are things we can anticipate, or remember, but we can witness only present eclipses and comets. Acknowledging the significance of experientiability is the first step. Next we need to take note of how our psychological and emotional dispositions towards an event, as well as our practical attitudes, as they are expressed in our deliberations and actions, depend on whether the event is present or not. Think about how one's psychological state shifts dramatically as a bungee jump becomes present, and again when it becomes past. Think about how one's practical thinking and behavior alters when a business negotiation one has been preparing for gets underway and after it is concluded. Thus, on top of being experientiable, being present means also being the potential source of a variety of sensations and attitudes that cannot be met with in relationship to events that are not present.

The sensitivity of dispositions and attitudes to tense has to be mapped out and described in detail. What I want to do in the remainder of the paper is explain why the alternative I have offered, in which experience plays such a pivotal, irremovable role, is nevertheless a brand of realism about tense.

Realism about X, as I understand it, means rejection of any form of verificationism about X and an adoption of bivalence with respect to X. In addition to this semantic characterization, I wish to add the following observation about experience. Our access to the world involves human machinery. This is true of all features of

reality. We are unavoidably tied to a particular perspective, we see and experience from a particular location, which grants us a particular angle and denies us many other angels, and from a particular distance, and under given light conditions, and by means of sense organs that are effected by pigmentation, age, nutrition, etc. (not to mention the possible impact on perception of background knowledge, culture, psychological makeup, and other factors). To be a realist is not to believe in some kind of magical access to the world that does not rely on and involve this machinery. It is not to somehow neutralize the impact of these factors. To be a realist is to hold that despite the fact that objects and their properties are given to us by means of our peculiarly structured sense organs and conceptual apparatus, and despite the fact that we cannot so much as describe objects and their properties without recourse to terms that are shaped in part by features of our makeup, objects and their properties are not constituted by us. Acknowledging the role of our human machinery in perception and its impact on perception does not force us to accept the further claim that the reality we access is in some way a product of this machinery, that somehow "we make the world". This realization does not, of course, imply a distinction between things as they are given to us and things as they are.

"Things" in "things as they are experienced by us" and in "things as they are" has the same referents.

Conjoining this characterization of realism with the above conception of tense and passage yields realism about the present. Semantically, realism about tense means that sentences that correctly describe events, and specifically, their tensed locations, are not made true by us. Specifically, the truthfulness of referring to an event, say, a lunar eclipse, as *present* as not derived from us. It is not through some process of verification that the sentence "an eclipse is observable in New Zealand *now*" acquires a truth value. Bivalence applies to it: "an eclipse is observable in New Zealand now" is either true or false, regardless of whether or not anyone is actually observing the eclipse, regardless even of whether anyone is aware that it is observable now. So verificationism does not enter

the scheme at all.[239] To put the point in blunt, non-semantic terms, my seeing the eclipse is not what makes it present. The eclipse has many features and properties, spatial, temporal, and other. As observed above, human machinery, with all its contingencies, is at work when we perceive it. In particular, temporal features of my experience are involved in facilitating my grasp of the tensed properties of the eclipse. But the presentness of experience pertains to how the presentness of the eclipse is given to us, it's not what constitutes it.

B-theorists agree that tensed sentences are often true, that is, they provide faithful and useful descriptions of reality. They even agree that they are not translatable or reducible to tenseless language. But they take this to be an exemplary case of conceptual relativity, of a multiplicity of descriptions which are all sustained by one set of facts tenseless fact.[240]

Physicalism, we recall, offers an analogy. The physicalist does not deny that there are true sentences about chairs and birds. She may even concede that they are not reducible to sentences about fields and particles. She insists, however, that the truth-makers of these sentences are the fields and particles which we know from physics. Likewise, the truthmakers for tensed sentences are tense-

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[239] Of course, the sentence does not exist before it is tokened, and so is neither true nor false prior to its tokening, just as a coffee is neither weak nor strong prior to its making. Truth values are properties of sentences, not of facts, and so to say that a proposition is either true or false independently of anyone thinking that it is either true or false is itself false. Only when someone tokens a sentence does it exist to be true or false, and in this respect truth does not exist independently of language and of speakers. But, once a speaker tokens a sentence, she gives birth to something that is already either true or false, irrespective of whether she can verify whether or not it is true, or of whether she knows, or can know, that it is true.

[240] To be precise, the relevant phenomenon is conceptual pluralism, not relativism, the latter having to do with equivalent descriptions, the former with description that function on different levels, and are in no way equivalent.

less facts. But why should we accept this? Given how fundamental tense is to experience and language, we need a very compelling reason to question its reality. And if, as I argued in part 1, B-theoretical arguments are effective only against presentism, then we have no such reason.

There is a further question, which I will only mention. Let us accept that there are tensed facts, and that these facts are the truth-makers for tensed sentences. Are there, in addition, also tenseless facts? We can answer in the affirmative and be realists about both tensed and tenseless relations. I, for one, think reality does not manifest this duplicity.

Without arguing the point, I would like to suggest that the tenseless/tensed dichotomy is artificial and groundless, insofar as language and experience go. Any statement of a tenseless relation is itself tensed. There is no sense in which the American Revolution tenselessly precedes the French Revolution. Rather, the American Revolution preceded the French Revolution. Let me then note the possibility that temporal reality does not break down into tensed and tenseless facts, and so that conceptual relativism and pluralism have no role in the investigation of time. My aim in this paper, however, was not to argue against the reality of tenseless relations, but to propose a way to be a realist about tense that essentially differs from presentism. Rather than analyze tense in terms of reality claims that make ontological comparisons, I propose to analyze it in terms of its experiential, psychological and emotional manifestations, and in terms of its practical relevance. That this kind of analysis, which would be inappropriate in other cases, is the correct one for time follows from the fact that experience itself has temporal properties, in fact, the very properties of the experienced. In the last part of the paper I strived to establish that this form of analysis can serve as a basis for a form of realism about tense.

Presentists and B-theorists each defend a valid and important claim. Presentist are adamant that tense is real. B-theorists are just as resolute in rejecting the notion that only present things are real,

or exist. The alternative I have offered accepts the reality of tense, but recognizes the meaningless of attributing to present things ontological superiority. Acknowledging experiences as "presentness rods" facilitates a phenomenological study of tense that yields a brand of realism about the present. If we add to this a rejection of the separation between tenseless and tensed truths then we attain a view of temporal reality which is truly and thoroughly tensed, just as our experience tells us it is.

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Abstracts

Characterizing Presentism
Neil McKinnon

This contribution seeks to uncover what is distinctive about the presentist view of time, and how it ought to be distinguished from other views, such as four-dimensionalism and the growing block picture. I begin by outlining desiderata that a satisfying account of presentism ought to accommodate. In particular, these include various metaphysical views that a successful account ought to be consistent with (for example, that time be circular, that things persist by enduring, and that the present has a non-zero duration). These are used to test prospective accounts of presentism. Ultimately, I conclude that what is distinctive about presentism is that it involves irreducibly tensed property instantiation *only*. Other views of time that are typically classified as tensed theories of time (such as the growing block and the moving spotlight pictures) are either varieties of presentism, or else, involve *both* irreducibly tensed and irreducibly tenseless property instantiation.

Characterizing Eternalism
Samuel Baron & *Kristie Miller*

Eternalism is undeniably a popular view in metaphysics. But there is really no single view that the name 'eternalism' reliably picks out; rather, there is a cluster of theses, and the conjunction of some or all of these is variously designated by 'eternalism'. In this paper, we pull apart this cluster of theses to present a more nuanced characterisation of the various different versions of eternal-

ism that one finds. We finish by briefly considering the relationship between eternalism and its chief rival: presentism. We present a new argument for the view that the ontological picture advocated by the eternalist is to be preferred to the ontological picture endorsed by presentists.

The Triviality of Presentism
Ulrich Meyer

This chapter argues that presentism is either trivially true (by claiming that nothing exists now that is not present) or obviously false (by claiming that nothing has, does, or will exist that is not present). This triviality objection does not carry over to the modal case and there is no comparable argument against actualism.

The Fate of Presentism in Modern Physics
Christian Wüthrich

There has been a recent spate of essays defending presentism, the view in the metaphysics of time according to which all and only present events or entities exist. What is particularly striking about this resurgence is that it takes place on the background of the significant pressure exerted on the position by the relativity of simultaneity asserted in special relativity, and yet in several cases invokes modern physics for support. I classify the presentist arguments into a two by two matrix depending on whether they take a compatibilist or incompatibilist stance with respect to both special relativity in particular and modern physics in general. I then review and evaluate what I take to be some of the most forceful and intriguing presentist arguments turning on modern physics. Although nothing of what I will say eventuates its categorical demise, I hope to show that whatever presentism remains compatible with empirical facts and our best physics is metaphysically repugnant.

Presentism and Relativity: No Conflict
Jonathan Lowe

This paper discusses three problems that have puzzled philosophers of time for many years, arguing that none of them really presents a difficulty if one adopts an adequate ontology and properly understands the nature of change. All of the problems turn in some way on the question of whether presentism is a coherent conception of time. Here it is proposed that the key to solving the problems is to realize that all change is fundamentally *existence*-change, that is, the coming into or going out of existence of entities of one kind or another. The three problems, which are interrelated, are McTaggart's paradox, Lewis's problem of temporary intrinsics, and Minkowski's notorious claim that the Special Theory of Relativity implies the disappearance of time 'by itself'. Of these, the last is the most important and in resolution of it the paper argues that presentism, properly understood, is not in conflict with the Special Theory of Relativity.

Presentism and Grounding Past Truths
Matthew Davidson

A number of people have objected to presentism on the basis that on it there is not a grounding for truths about the past. In this paper, I set out the objection to presentism from truthmaking, and I survey and evaluate several attempts to respond to the problem.

Grounding Past Truths: Overcoming the Challenge
Brian Kierland

In this paper, I defend presentism from the grounding objection. I do this by exploring a novel version of presentism, *primitive record presentism*. It says that the truth of past-tense propositions is explained by the world's possession of fundamental trace properties together with a sui generis law of nature that governs how the world's character at one instant causally determines which

trace properties it possesses at later instants. Largely by appealing to certain constraints, I argue that primitive record presentism offers an attractive answer to the grounding objection, one that is superior to the answers offered by other versions of presentism (in particular, nomic presentism, Lucretianism, abstract times presentism and theistic presentism). Additionally, I argue that a plausible response can be given to an important objection facing many versions of presentism, including primitive record presentism.

Presentism and Cross-Temporal Relations
Roberto Ciuni & Giuliano Torrengo

Cross temporal relations (CTR for short) are troublesome for the presentist. Consider for instance the true claim that "Jules is a descendant of his great grandfather". On the face of it, such a claim entail that Jules bear a certain relation tho a past entity (assuming his great grandfather is no longer among us). But how could that be if — as the presentist maintains — past entities lack existence? In the present contribution, we will review the two main strategies that the presentist can endorse to withstand such a problem. The presentist may either endorse an "eliminativist" stance and claim that there are no CTR after all; or she can endorse a "reductionist" stance and argue that we can accommodate CTR within a presentist framework. We will argue that both stances (in their many varieties) fail to work.

Presentism, Primitivism and Cross-Temporal Relations:
Lessons from Holistic Ersatzism and Dynamic Semantics,
Berit Brogaard

Metaphysical eternalists occasionally offer presentists the following challenge: If only present things exist, how are we to account for the truth of claims of the following sort: 'Al Gore is taller than almost any ancient politician', 'Russell was smarter than most philosophers of his generation' and 'The short circuit caused the fire'. The alleged problem for the presentist is that claims like these

would seem to ascribe relations one or both of whose relata do not exist. But this violates the Principle of Relations, *viz.* if $x, y, z, \ldots$ stand to each other in relation R, then $x, y, z, \ldots$ exist. Non-serious presentism allows past instantiations and hence entails a rejection of the Principle of Relations. But few have found non-serious presentism convincing, mainly because it seems to commit us to Meinongian entities. In previous work I have developed and defended a view I call "primitivism about tensed relations". This view rejects the Principle of Relations but does not commit us to Meinongian entities. Objectors have subsequently argued that my view does entail a commitment to Meinongian entities after all, that there is no time at which my primitive relations are instantiated, that I violate the grounding principle and that my version of presentism does not meet minimal explanatory requirements. On account of these objections, I will expand on my view here. I will also offer a supplementary strategy that even the most hardcore of truth-maker enthusiasts should accept. This strategy borrows from holistic modal ersatzism and dynamic semantics.

An Heterodox Presentism: Kit Fine's theory
Jonathan Tallant

Kit Fine ([Fine 2005]) has articulated a position according to which reality is fragmented. In this paper I will refer to this view as 'Heterodox Presentism'. I want to try and do two things. First, I want to try and undermine the arguments presented by Fine in favour of Heterodox Presentism and show that the view is unmotivated—in part by the fact that it fails to meet some of the standards that Fine sets for it. The second target aim is to offer some very informal and sketchy remarks as to how we might better construe the 'standard' view of realism, or 'presentism' to which Fine objects—the view that I will define here as 'only present objects exist'. As we shall see, my own view of presentism differs quite substantially from this pithy slogan.

A Real Present without Presentism
Yuval Dolev

I argue that while tense and passage are features of the fundamental structure of reality, the essence of the differences between being past, present or future cannot be captured by appealing to an ontological analysis. Thus, while eternalists are wrong in denying the reality of tense and passage, presentists are misguided in arguing that what makes certain events present is their being "more real" than those that are not, and that passage consists in the successive conferring of some "ontological superiority" on events as they become present. In order to understand tense and passage we must turn from ontology to phenomenology, and study the experiential manifestations of tense. I propose that the tensed features of our firsthand experiences figure as hinges for our conception of tense but that, despite the reliance on experience, the conception of tense that emerges from a phenomenological inquiry constitutes a form of realism about it.

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