Presentism, roughly, is the thesis that only the present is real. The opposite view is *eternalism* or *four-dimensionalism*, the thesis that reality consists of past, present and future entities.[1] After spelling out the presentist's thesis more carefully, I shall say something about why one might think it true. Finally, I'll develop four prominent objections to presentism and say something about how the presentist might reply to each.

1. PRESENTISM EXPLAINED

Presentism is a thesis about what there is, about the range of things to which we're ontologically committed. Simply put, it's the thesis that *everything* is present. Though we'll eventually need a refinement or two, we can put it thus:

(Pr) For every x, x is present,

where an object x is present iff x *occupies* or *exists at* the present time. Four comments. First, (Pr)'s quantifier is to be taken as *unrestricted*, one which ranges over *everything*. Its domain is our most inclusive domain of quantification rather than some sub-domain of our most inclusive domain.

Second, we shall think of *the present time* as follows. Say that an object x is *slim* iff, for any y and z, if y and z are parts of x, then there is either no temporal distance or a temporal distance of *zero* between y and z. A *time*, let us say, is a maximal slim object: an object such that the mereological sum of it and anything which isn't a part of it is not slim.[2] The present time, intuitively, is the maximal slim object that includes as a part every event[3] that occurs *now*.

Third, say that something *exists at* or *occupies* the present time iff it is a part of the present time. And finally, I leave undefined the notion of temporal distance, though the intuitive idea should be clear enough. If our most inclusive domain of quantification includes past as well as present entities, it presumably includes Lincoln and his assassination. The temporal distance between his assassination and the present is a little over 137 years.

Some will complain that (Pr), as it stands, is either trivially true or manifestly false.[4] Since the universal and the existential quantifiers are duals, (Pr) can be re-expressed as

(Pr$_e$) ~(there exists something x such that ~(x is present)).

Now, what is the tense of the verb "exists" in the above quantifier phrase "there exists something x such that …"? Is it present tensed? If so, (Pr$_e$) amounts to the denial of the claim that something which exists now (i.e., at the present time) is such that it is not present. But, trivially, nothing which exists at the present time isn't present. (Pr$_e$), so read, amounts to a trivial truth.

Perhaps "exist" here is to be read *disjunctively*, yielding:

(Pr$_e$$'$) ~(there existed, exists or will exist something x such that ~(x is present)).

But this doesn't look promising since (Pr$_e$$'$) amounts to the denial of the claim that there existed, exists or will exist something which isn't present. But surely there existed something which isn't present. Who can deny that there existed something identical with the Roman Empire which is no longer present? If (Pr$_e$$'$) forces us to deny this, it is a trivial falsehood.

Maybe the verb should be read *tenselessly*:

(Pr$_e$$''$) ~(there exists (tenselessly) something x such that ~(x is present)).

Those who "take tense seriously" will object that there *are* no tenseless verbs.[5] But even if they're wrong, (Pr$_e$$''$) doesn't fare any better than its predecessors. It's a simple matter of logic that (Pr$_e$$''$) implies

(Pr_e''') ~(there exists (tenselessly) a past, present or future thing x such that ~(x is

      present)).

But the latter, presumably, is true iff it is false that there existed, exists or will exist something x

such that ~(x is present)—iff (Pr_e') is true. The upshot: (Pr_e'') implies (Pr_e'''), which is logically

equivalent to a trivial falsehood. Since it's obvious that this is so, it's obvious that (Pr_e'') is false.

      In sum: if (Pr_e)'s "exist" is present-tensed, it is a trivial truism. If disjunctively tensed or

tenseless, it is manifestly false. Since it's hard to see how else to read it, it looks as if (Pr_e) is

either trivially true or manifestly false. And, since (Pr) is presumably equivalent to one or

another of these readings of (Pr_e), (Pr) fares no better. Presentism is either a trivial truism or a

manifest falsehood.

      I reply that the foregoing complaint—call it the *triviality complaint*—trades on a *de re/de*

dicto ambiguity. Take the disjunctively tensed reading of (Pr_e), the denial of

      (4Dism) There existed, exists or will exist something x such that ~(x is present).

(4Dism) admits of a *de re* and a *de dicto* reading. Read *de re*, its quantifier phrase "there existed,

exists or will exist" expresses quantification over the domain of temporal things, the domain of

things which existed, exist or will exist. (4Dism), on this reading, comes to something like:

      ($4Dism_r$) Quantifying over all temporal things, for some x, x was, is or will be such that it

          doesn't exist in t_α,

where "t_α" names the present time. Presentism ((Pr)) is logically equivalent to the denial of this

claim.

      Read *de dicto*, (4Dism) says something like:

      ($4Dism_d$) It was, is or will be the case that: something is such that it doesn't exist in t_α.

(4Dism$_d$) is a *de dicto* claim predicating of the *dictum* or proposition *something is such that it doesn't exist in t$_a$* the property of either having been true, being true now, or being such as to be true in the future. (Pr) is not logically equivalent to the denial of (4Dism$_d$): it's possible both that (a) for every x, x is present, and (b) the proposition *something doesn't exist in t$_a$* was, is or will be true.

Now, the triviality complainer proposes that (4Dism) is trivially true on the grounds that there existed something *x*—viz. the Roman Empire—such that *x* existed, and *x* isn't present. Take the *de re* reading of (4Dism) first. Does the past existence of the Roman Empire render (4Dism)—so construed—trivially true? No. It is not a trivial truth that the open sentence following the quantifier in (4Dism$_r$) is satisfied by the Roman Empire. This is because it's not a trivial truth that our most inclusive domain of quantification is still populated by something identical with the Roman Empire. Were it trivially true that the four-dimensional view of space and time is correct—that our most inclusive domain of quantification includes past, present and future entities—I suppose it would be obvious that our widest quantificational domain still includes the Roman Empire. But four-dimensionalism *isn't* trivially true. It may *be* true, but if it is, we require serious argument to see that it is.

Construed *de dicto*—that is, read as (4Dism$_d$)—(4Dism) is trivially true all right, and this because it's an obvious fact of history that

WAS(something identical with the Roman Empire will not exist in t$_a$).[6]

But nothing interesting follows. The preceding argument presupposed

(P1) (Pr$_e$), read disjunctively, is a trivial falsehood because it is the denial of (4Dism), a

trivial truth.

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Read *de dicto*—as (4Dism$_d$)—(4Dism) is a trivial truth and (P1) comes out true. But this helps the triviality complainer's case only if it's also true that

(P2) (Pr$_e$), read disjunctively, is logically equivalent to (Pr)

(her strategy, remember, is to claim that (Pr) fares only as well as (Pr$_e$) since the two are logically equivalent). Here there's trouble. (Pr$_e$), construed as the denial of (4Dism$_d$), is *not* logically equivalent to (Pr) since (4Dism$_d$) is compossible with (Pr). Read *de re*—as (4Dism$_r$)—the denial of (4Dism) (aka Pr$_e$) is logically equivalent to (Pr) and (P2) comes out true. But so read, (4Dism) is not a trivial truth and (P1) comes out false.

Summarizing: (4Dism) admits of two plausible readings, a *de re* and a *de dicto* reading. Read it *de re* and (P1) comes out false; read it *de dicto* and (P2) comes out false. Since the triviality complainer requires the truth of both (P1) and (P2), I conclude that her complaint can be adequately answered. Presentism, construed as (Pr), is neither trivially true nor trivially false.

That said, presentism probably shouldn't be construed as (Pr). To arrive at a proper statement of the thesis, we need one—maybe two—emendations. First, presentism is better construed as the claim that it's *always* the case that, for every *x*, *x* is present. Some philosophers (e.g. C. D. Broad (1923) and Michael Tooley (1997)) think of the spatiotemporal world as a growing four-dimensional block. On this view, the world includes past and present entities but no future entities. As time passes, new entities come into existence and the four-dimensional universe grows by accretion. Presentists reject this view of time. Note, though, that if time has a first moment and the growing-block view is right, for a brief moment at the dawn of time, (Pr) is true. Better, then, to think of presentism as the claim that it's always the case that, for every *x*, *x* is present. And second, most presentists think of their theory as necessarily true if true. I shall

reserve judgment about this latter emendation. The reasons I know of for being a presentist offer

no reason at all for thinking presentism a necessary truth.

For purposes of this article, then, let us think of presentism as the following thesis:

(Presentism) It is always the case that, for every x, x is present.

2. WHY PRESENTISM?

There are no knock-down arguments for presentism; like most other substantive theses in

philosophy, it cannot be established conclusively. It is, however, a natural position to take given

certain metaphysical and linguistic commitments, commitments which I (and many others I

suspect) find attractive. I shall now lay out those commitments and say a few words about why

one might think them plausible. I shall not offer conclusive arguments for them. Though I take

these commitments to accord well with the deliverances of "common sense," I don't think

conclusive arguments are to be had. I'll close this section by arguing that presentism is the only

metaphysic of time consistent with these commitments.

First Metaphysical Commitment: Endurantism

Endurantists think that spatiotemporal continuants persist through time by *enduring*.[7] A

thing persists through time, loosely speaking, when it exists at various times. A thing x *endures*,

we'll say, iff (i) it never has a *temporal extent* (i.e., it is not "spread out" in time in the way that

my desk is "spread out" in space) and (ii) for some $m \neq n$, it was (will be) the case n units of time

ago (hence) that, for some y, $x=y$, and it was (will be) the case m units of time ago (hence) that,

for some z, $x=z$.[8] The opposite of this view is *perdurantism*: roughly, the thesis that

spatiotemporal continuants persist through time by being spread out in time in the way that

things like my desk are spread out through space. Perdurantism comes in two main varieties.

Worm-theoretic perdurantism says that spatiotemporal continuants like you and me are spatiotemporal "worms": mereological fusions of *instantaneous temporal parts* or *stages*[9] located at different times.[10] Stage-theoretic perdurantism is the view that the spatiotemporal continuants recognized by common sense, continuants like you and me, are instantaneous temporal stages.[11] (A brief word of explanation about the latter view. One might be tempted to ask: if the spatiotemporal continuants of ordinary belief—desks, chairs and the like—are to be identified with instantaneous temporal stages, in what sense are they *continuants*? A continuant, one thinks, is something with a history, something which lasts longer than an instant. Theodore Sider, a contemporary defender of the stage view, answers that *de re* predication of temporal properties like *being such as to exist in the past* should be analyzed in terms of a temporal version of modal counterpart theory. On this view, to say that my desk has the property of existing in the past is to say that it has a counterpart in the past. So to the question whether, on his view, my desk is really a persisting thing, Sider answers *yes*, since after all, it has the property of existing now and of existing in the past (it occupies the present time and has counterparts which occupy past times).)

Thus far endurantism and its main alternatives. Why might one endorse endurantism over its rivals as an account of persistence? Here is one reason. Whereas endurantism comports nicely with certain obviously true claims, its competitors don't. Consider the distinction between having a property *directly* and having a property *indirectly*. I have a property *F indirectly*, let us say, iff I have *F* in virtue of the fact that one of my proper parts has *F*. For example, I am seated at present. Given worm-theoretic perdurantism, I have the property of being seated at present by virtue of the fact that one of my proper temporal parts is seated at present. I have a property F *directly*, say, iff I have *F* but nothing is, was or will be such that (a) it is a proper part of me and

(b) it has *F*. For example, I have a headache. But, one thinks, I do not have the property of having a headache by virtue of the fact that any proper part of mine has this property: though I have a headache, presumably none of my proper parts does.

Now, I take it as obviously true that I have my headaches directly rather than indirectly. Endurantism implies nothing to the contrary. Not so, however, with worm-theoretic perdurantism. On this view, my having a headache at present is a matter of one of my proper temporal parts having a headache at present. The upshot: on the worm view, I have my headaches indirectly rather than directly. So much the worse, I say, for worm-theoretic perdurantism.

I also take it as obviously true that it was someone numerically identical with me who began typing this sentence. The stage-theoretic perdurantist denies this: on her view, the person who began the previous sentence was someone numerically distinct from the person who ended it, though similar in many ways. The endurantist, on the other hand, is free to suppose that one and the same person, strictly speaking, started and ended the sentence.

So endurantism comports well with certain obvious truths, truths which its rivals must deny. I find it attractive for this reason. I realize that these remarks will persuade few non-endurantists. For one thing, not everyone will agree that it is obviously true that I have my headaches directly or that one and the same person, strictly speaking, started this sentence as ended it. And for another, many will agree that non-endurantist theories of persistence have counterintuitive consequences, but they'll think of the benefits of these theories as outweighing their costs. So I don't pretend to have given a serious argument for endurantism. As advertised, I'm offering only brief comments on why one might find it attractive.

Second Metaphysical Commitment: The Change Thesis

Things change. A complete description of the present moment will describe me differently than a complete description of the world as it was ten years ago. According to the first, I'll have properties and stand in relations such that, according to the second, I don't. We might put the point as follows. Say that successive instants of time are exhaustively described by *instant-descriptions* (*i-descriptions* for short): propositions which express maximally detailed descriptions of an instantaneous state of the world. One i-description describes the present moment; i-descriptions of the past describe what was; i-descriptions of the future describe what will be.

Again, a complete description of the present moment will describe me differently than a complete description of the world as it was ten years ago. More generally and in terms of i-descriptions:

> *Change Thesis*: According to i-descriptions of the past, I have properties and stand in relations which, according to the present i-description, I do not have and do not stand in. I-descriptions of the past represent me as having properties and entering into relations distinct from those I'm represented as having and entering into by the present i-description.

What can be said on behalf of the Change Thesis? Other than that it seems obviously true, I have no idea.

Linguistic Commitment: The Univocality of Tense

Were you to insist that there are two equally good candidates for the meaning of the word "was" such that, given the first, it was true that Lincoln is president, but given the second, it was never true that Lincoln is president, I should think you'd been corrupted by philosophy. No

doubt one can think of outré meanings of "was" on which it was never true that Lincoln is president. But there is no plausible candidate for its ordinary language meaning on which it was never true that Lincoln is president. This is because there is just *one* plausible candidate for the meaning of our ordinary language "was", and given this meaning, it was true that Lincoln was president. So too with other tensed expressions. The words "will" in "the meeting will start at noon" and "has been" in "my watch has been malfunctioning" are univocal: linguistic convention together with whatever else it is that fixes meaning[12] has affixed just one semantic value to each of these ordinary language tensed expressions (presumably, a different one for each). What *is* the semantic value of these expressions as deployed in ordinary language? This is not an easy question. More important for present purposes is that they are univocal. In a slogan: tense is univocal. Call this the Univocality Thesis.

What can be said on behalf of this thesis? Here again, other than that it seems obviously true, I'm not sure.

The Argument for Presentism

The best reason for being a presentist, I think, is that presentism is the only metaphysic of time consistent with the foregoing metaphysical and linguistic commitments. I shall now try to show that, among the main alternative metaphysics of time, presentism alone satisfies these constraints.

My argument takes for granted that the following theories exhaust the options: presentism, static eternalism and dynamic eternalism. Let me briefly explain the latter two positions. Eternalism, again, is the view that reality includes past, present and future entities. Better: it's the thesis that our most inclusive domain of quantification includes entities at non-zero temporal distance from one another. Thus understood, eternalism is the opposite of

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presentism. Dynamic eternalism is the conjunction of eternalism and a dynamic or A-theoretic view of time.[13] Static eternalism is the conjunction of eternalism and a static or B-theoretic view of time. One holds a dynamic or A-theoretic view of time, I shall say, iff one subscribes to the following thesis:

> *Absolute Change*: Where C is the most inclusive class of events, either it was false that C is the most inclusive class of events or it will be false that C is the most inclusive class of events.

On the dynamic conception of time, then, the totality of events in existence changes over time. Not so on the static or B-theoretic conception. A static or B-theoretic conception of time, as I shall think of it, is any conception of time on which the Thesis of Absolute Change is false.

My argument has three parts. First, I'll argue that static eternalism is inconsistent with the conjunction of endurantism and the Change Thesis. Then I'll argue that dynamic eternalism is inconsistent with the Univocality Thesis. Finally, I'll suggest that presentism is consistent with the conjunction of all three.

Part I: Static Eternalism is Inconsistent with Endurantism and the Change Thesis

Suppose for *reductio* that static eternalism, endurantism and the Change Thesis are all true. The Change Thesis says, again, that according to i-descriptions of the past, I have properties and stand in relations which, according to the i-description of the present, I do not have and do not stand in. To fix ideas, let us think of i-descriptions of "the past" and "the present" in the following way. Let us suppose that the eternalist's past, present and future entities are embedded in a *spacetime*, a four-dimensional manifold of point-sized entities which contains or embeds all the objects and events of our spatiotemporal world. (We presuppose, then, a *substantival* view of spacetime: the view that the quantifiers of the physicists' spacetime

theories range over an entity, spacetime, which contains or embeds the objects and events of the physical world. Nothing crucial hangs on this: everything I say is easily re-cast in terms of a *relationalist* view of spacetime, the view that all talk about spacetime in our scientific theories is reducible to talk about the spatiotemporal properties of and relations among physical objects.) Say, then, that an i-description of "the past" ("the present") is a maximally detailed description of the objects and events embedded in a past (present) *timeslice*, where a timeslice is a global three-dimensional spacelike hypersurface of spacetime. (Set aside for now questions arising from relativistic physics like: past with respect to *whom*?)

A note about endurantism in the context of our spacetime construal of eternalism. Endurantism says that spatiotemporal continuants persist through time but have no temporal extent. In the context of spacetime eternalism, this amounts to the thesis that spatiotemporal continuants are three-dimensional objects which persist through spacetime by exactly occupying or overlapping disjoint three-dimensional sub-regions of spacetime at timelike separation from one another. Continuants, on this picture, are *multiply located* entities since they exactly occupy or overlap multiple, disjoint regions of spacetime. (So continuants on this view are like David Armstrong's recurring universals which, if they exist, are multiply located constituents of spatiotemporal things.[14])

The Change Thesis, then, amounts to the claim that for some relation R[15] and for some i-descriptions d_1 and d_2 such that d_1 and d_2 exhaustively describe timeslices t_1 and t_2 respectively, according to d_1, I exist and stand in R, and according to d_2, I exist but do not stand in R. Suppose this claim true. Say too that I am an enduring object, multiply located at non-overlapping three-dimensional regions of spacetime at timelike separation from one another. If so, then d_1 describes t_1 as containing a three-dimensional object identical with me which stands in R, and d_2

describes t_2 as containing a three-dimensional object identical with me which does not stand in R. If d_1 describes t_1 as containing something identical with me which stands in R, then quantifying over the occupants of t_1, something identical with me stands in R. Likewise, if d_2 describes t_2 as containing something identical with me which does not stand in R, then quantifying over the occupants of t_2, something identical with me does not stand in R. From this it follows that, quantifying over the occupants of both t_1 and t_2, something identical with me both stands in R and does not stand in R. But nothing could manage that! Static eternalism conjoined with endurantism and the Change Thesis yields contradiction.

Here I expect two rejoinders. First, you might object that this argument pays insufficient attention to *tense*. Suppose that t_2 is the present time and t_1 a past time. If d_1 describes t_1 as containing something which is identical with me and stands in R, then given that t_1 is past, we are entitled to infer only that, quantifying over the occupants of t_1, something identical with me *stood* in R. And if d_2 describes t_2 as containing something identical with me which does not stand in R, then given that t_2 is present, we can infer only that, quantifying over the occupants of t_2, something identical with me does not now stand in R. So from d_1 and d_2, we can infer only that, quantifying over the occupants of t_1 and t_2, something identical with me stood in R but does no longer. Since there's nothing contradictory about this, we see how to avoid the contradiction: simply take the tense of our verbs seriously.

But how does taking the tense of our verbs seriously help here? If I *stood* in R but do no longer, then given the Change Thesis and static eternalism, d_1, the i-description of a past timeslice t_1, describes me as a relatum of R, and d_2, the i-description of the present timeslice t_2, doesn't. Since (given endurantism) I occupy or overlap both t_1 and t_2 (or, for those worried that I'm not being sufficiently attentive to the tense of my verbs: I presently stand in the *occupies* or

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overlaps relation to both t_1 and t_2), we get the bizarre result that a maximally detailed description of t_1 describes me, qua overlapper of t_1, as a relatum of R, but a maximally detailed description of t_2 describes me, qua overlapper of t_2, as not standing in R. But how could this be? Conjoined twins Abby and Brittany share their legs in common. Let A be a maximally detailed description of Abby. A describes a shared leg as the right leg of Abby. Let B be a maximally detailed description of Brittany. Could it be that, according to B, the leg in question is *not* the right leg of Abby? Of course not.[16] Likewise, then, with d_1 and d_2.

Second rejoinder. Static eternalism *is* compatible with change. For, you might think, to change is to be F at some times and not at others, where F is a schematic term replaceable by any monadic predicate expression. But it's perfectly compatible with static endurantism that things endure and undergo change in this sense. For instance, some think that being F at a timeslice t is simply a matter of occupying t and bearing the *F-at* relation to it.[17] According to this proposal, to be fat at a timeslice t_1 and not at a timeslice t_2 is to occupy both t_1 and t_2 and bear the *fat-at* relation to the first but not the second. Since there is nothing contradictory about a thing's wholly occupying two timeslices and being, in this sense, fat at the one and not at the other, we see that static eternalism conjoined with endurantism is compatible with change.

But this argument is an *ignoratio elenchi*. For I did not argue that the conjunction of static eternalism with endurantism is inconsistent with the sort of change described in the previous paragraph. I argued, rather, that the conjunction of static eternalism and endurantism is incompatible with the Change Thesis. And a thing could occupy both t_1 and t_2 and bear the *fat-at* relation to the first but not to the second without changing in the sense specified by the Change Thesis.

Perhaps you'll reply that change, at least the sort given us by common sense, the sort one undergoes when one is F at one time and not at another, does not require the sort of change specified by the Change Thesis. If I occupy t_1 and t_2, bear the *fat-at* relation to one but not the other, then I change, even if there is no property F or relation R such that, according to a maximally detailed description of t_1, I have F or stand in R, but according to a maximally detailed description of t_2, I don't. Since change—the common sense sort of change—is perfectly compatible with the conjunction of static eternalism and endurantism, it's of little interest that change a là the Change Thesis isn't.

I disagree. Give a maximally detailed description of any 1972 timeslice that contains a toddler-shaped region of spacetime exactly filled by me. Compare that description with the i-description of the present timeslice. To my mind, it is simply incredible to suppose that these descriptions will represent me as having just the same properties and standing in just the same relations. Accordingly, I can make no sense of the idea that the Change Thesis is false. Given that I find endurantism an attractive theory of persistence, it's of great interest to me, anyway, that static eternalism, endurantism and the Change Thesis are jointly incompatible.

Part II: Dynamic Eternalism is Incompatible with the Univocality Thesis

I make various assumptions. First, I shall suppose for conditional proof that dynamic eternalism is true. If so, then (i) the totality of events in existence changes over time in the sense specified by the Thesis of Absolute Change and (ii) the spatiotemporal world is embedded in a spacetime manifold and at least some parts of that world are at non-zero temporal distance from one another.

Next, I shall follow Roderick Chisholm in thinking of events as concrete things which occur iff something instantiates a property.[18] We'll say that, for any x, the event *x-being-F*

occurs at (is located at, exists at) a region R of spacetime iff x is located at R and bears the having

relation to F. Given the eternalist's picture and this account of events, the following seems hard

to deny:

> *Event Thesis*: If for some y located at a past timeslice t, $y = x$-being-F, then x-being-F
>
> *occurred* at t.

To illustrate, the event *Lincoln-being-assassinated* is part of our past: something located in a past

timeslice t is identical with it. It seems quite natural to say, then, that it occurred at t, where here

(and in the statement of the thesis), we use the "occurred" of ordinary language, as in "the

meeting occurred yesterday."

Now, according to the dynamic eternalist, the totality of events in existence changes over

time. Let C be the class which is presently the most inclusive class of events. Then dynamic

eternalism says that it was false or will be false that C is the most inclusive class of events.

Suppose it was false that C is the most inclusive class of events because it was false that C exists.

It was false that C exists, say, because events which are now members of C have come into

existence recently. (An event e has come into existence recently iff something is identical with e

but it was the case not long ago that nothing in our most inclusive domain of quantification is,

was or will be identical with e.) Since (we shall suppose) classes have their members essentially,

if events which are now members of C have come into existence recently, we get that it was false

that C exists. To fix ideas, say that it was false exactly ten years ago that C exists.

Something x is *lonely*, say, iff x does not co-exist with C—iff, for some y in our most

inclusive domain of quantification, $y = x$, but for no z in that domain is it true that $z = C$. ("C",

again, names that class which is presently the most inclusive class of events). Something is

accompanied iff it is false that it is lonely. So everything—quantifier wide open—is

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accompanied. But if we assume with the dynamic eternalist that it was false exactly ten years ago that *C* exists, we may infer that, exactly ten years ago, everything—quantifying unrestrictedly—was lonely.

Now, let Fred be some wholly past object which occupies a past timeslice *t* located exactly ten years before the present. (Say too that Fred is short-lived: he occupies *only t*.) Since everything, quantifying unrestrictedly, is accompanied, Fred is accompanied. That is, the having relation links Fred and the property *being accompanied*. Given our Chisholmian theory of events, we may infer that the event *Fred-being-accompanied* is located at t, exactly ten years in the past. Given this and the Event Thesis, we may infer that *Fred-being-accompanied* occurred exactly ten years ago.

But if, exactly ten years ago, everything was lonely (see the paragraph before last), then exactly ten years ago, Fred was lonely. And if Fred was lonely exactly ten years ago—if, exactly ten years ago, Fred had the property of *being lonely*—then from our Chisholmian theory of events we may infer that, exactly ten years ago, there occurred the event *Fred-being-lonely*. So we get this: exactly ten years ago, the events *Fred-being-lonely* and *Fred-being-accompanied* both occurred. But it should be clear that this is impossible. You might as well say that exactly ten years ago, *the-stick-S-being-bent* occurred, as did *the-stick-S-being-straight*. What's to do?

I see two options. First option: postulate two tenses. *Fred-being-lonely* occurred exactly ten years ago; so did *Fred-being-accompanied*. That is, it was the case exactly ten years ago that *Fred-being-lonely* occurs; and it was the case exactly ten years ago that *Fred-being-accompanied* occurs. Both claims are true. In both cases, we use an ordinary language "was". But "was" in ordinary language is equivocal (more generally, tense in ordinary language is equivocal). There's the "was" we use—was$_1$—when we say truly that it was the case ten years ago that

Fred-being-lonely occurs, and there's the "was" we use—was$_2$—when we say truly that it was the case ten years ago that *Fred-being-accompanied* occurs. Each "was" means something different, and they work in such a way that it is perfectly sensible to suppose both that it was$_1$ the case exactly ten ago that *Fred-being-lonely* occurs, and it was$_2$ the case exactly ten years ago that *Fred-being-accompanied* occurs. In brief, the Univocality Thesis is false.

Second option: reject the Event Thesis. We've supposed that if something located at a past timeslice *t* is the event *x-being-F*, then *x-being-F* occurred at *t*, where the "occurred" in play here is the "occurred" of ordinary language, as in "the meeting occurred yesterday." We avoid contradiction and the need for two tenses in ordinary language if we simply deny the inference from "there is something identical with *x-being-F* located ten years ago" to "*x-being-F* occurred ten years ago." There might be a technical, philosopher's sense of "occurred" on which this inference holds, but given ordinary language use of the word, the inference fails.

I find the latter suggestion to be misguided. If an event is located in the past, then it follows quite obviously, I think, that this event occurred, in the ordinary sense of the word. How could there be past events which never occurred (in that ordinary sense of "occurred")? By my lights, anyway, denying the Event Thesis is not a serious option.

This leaves the first option.[19] I can't see any other way for the dynamic eternalist to avoid contradiction. Thus I conclude that dynamic eternalism is incompatible with the Univocality Thesis.

Part III: Presentism is Consistent with Endurantism, the Change Thesis, and the Univocality Thesis.

The presentist has no difficulty accommodating the conjunction of endurantism, the Change Thesis and the Univocality Thesis. First, nothing about presentism implies that tensed

expressions aren't univocal. Second, the presentist is free to suppose that among the present things are i-descriptions which presently misrepresent the world but *were* or *will be* such as to accurately represent it. The Change Thesis says that, among the i-descriptions which were accurate descriptions of the world are i-descriptions that represent me as having properties and entering into relations distinct from those I'm represented as having and entering into by the i-description which now represents the world. Presentism implies nothing to the contrary. Finally, the thesis of endurantism says that a present thing x has persisted iff (i) x has no temporal extent (and never has), and (ii) for some n, it was the case n units of time ago that something is identical with x. Given presentism, nothing ever has a temporal extent. And it's perfectly consistent with presentism that the proposition that something is identical with me both is and was true.

The upshot: unlike its alternatives, presentism comports nicely with our foregoing metaphysical and linguistic commitments. For those of us who find these commitments attractive, this is good reason for believing presentism to be true. Not conclusive reason, however, since presentism's costs may be severe enough to outweigh this advantage. Many philosophers suppose that presentism's costs are severe indeed. In the next section, I lay out what I take to be the strongest reasons for thinking so. I'll urge that presentism's costs have been greatly exaggerated.

3. THE PRICE OF PRESENTISM

3.1 PRESENTISM AND SINGULAR PROPOSITIONS

Some propositions are *about* me. For example, the propositions *Crisp is a lousy chess player*, and *Alison married Crisp* are about me. So too with *the husband of Alison is a lousy chess player*: it is also about me. But the first propositions seem importantly different from the

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last. The first two, as it is sometimes put, are more *directly* about me than the last. What's to say here? What makes the first two propositions more directly about me than the last? It's not at all easy to specify. Rather than trying, let us take the distinction between these sorts of propositions as primitive and call a proposition which is directly about an individual—in the way that *Fischer is a good chess player* is directly about Fischer—a *singular* proposition.

Some philosophers suspect that singular propositions—some of them at any rate—spell trouble for presentism.[20] Call something *wholly past* if it used to exist, does not now exist and won't exist. (The notion of *wholly future* is defined likewise.) Presentism entails that there are neither wholly past nor wholly future objects. But, it would appear, there are singular propositions about wholly past objects—e.g., *Lincoln was tall*—and maybe wholly future objects too—e.g., *Newman₁ is human*, where we stipulate that "Newman₁" shall name the first person born next century.

This poses a problem for the presentist if we accept a widely held thesis about singular propositions. Following Alvin Plantinga,[21] let us think of *existentialism* as the thesis that singular propositions depend for their existence on the individuals they are about. We can put the thesis more precisely as follows. I shall follow George Bealer in thinking of "[Fx]" as a singular term such that (i) its referent is the singular proposition that x is F, and (ii) it can contain externally quantifiable variables—e.g., $\exists x \exists y (x = [Fy])$.[22] I'll say too that the standard modal operators "□" and "◇"are one-place predicates which apply to singular terms like "[Fx]". Thus armed, we can state existentialism more precisely as follows:

(**Existentialism**) $\Box[\forall F \forall y \forall x_1, x_2, \ldots (y = [Fx_1, x_2, \ldots] \rightarrow \Box[\exists z(z=y) \rightarrow . \exists v_1(v_1=x_1)$.

$\exists v_2(v_2=x_2)$. $\ldots])].$

In English: necessarily, for every F and y and every $x_1, x_2, \ldots$ such that y is the proposition that $Fx_1, x_2, \ldots$, necessarily, y exists only if $x_1, x_2, \ldots$ also exist.[23]

To see why the presentist has trouble if existentialism is true, suppose that no present object is Lincoln. Given presentism, this is to say that *nothing* is Lincoln. Though it was the case that something is identical with Lincoln, this is true no longer. But given existentialism, if this is so, it follows that *there are no singular propositions about Lincoln*. And isn't this absurd? Surely there *are* singular propositions about Lincoln; I've just expressed several of them. We believe that Lincoln was the 16th president, that he was wise, that he was tall, etc. In so believing, we grasp singular propositions about him (or, at any rate, singular propositions which were about him). This is utterly obvious. So the presentist faces a dilemma. Either she must deny that there are singular propositions about wholly past and wholly future objects, or she must reject existentialism. The first horn of the dilemma is unattractive: surely there are singular propositions about the wholly past, e.g. *Lincoln was tall*. But the second horn is no better. Existentialism, these days, is *de rigueur*. This is because, on the usual account of singular propositions, they are non-mereological fusions which contain as *constituents* the objects they are about. Like sets, they are thought to depend for their existence on their constituents.

Philosophers have responded in different ways.[24] Theodore Sider (not himself a presentist) thinks that the presentist should grant that there are no singular propositions about the wholly past and that sentences like "Lincoln was tall" do not express truth. Though the presentist can't help herself to the *truth* of sentences like "Lincoln was tall," says Sider, she can regard them as *quasi-true* ("Lincoln is tall" is quasi-true if there is a true proposition that would have been true and would have entailed the truth of "Lincoln is tall" had four-dimensionalism been true (1999: 332-333)). It's a good thing for a philosophical theory if it can "save" the truth

of our ordinary talk and thought about the world. Theories which can't pay a theoretical price.

The price isn't high, though, if they can at least save the quasi-truth of our ordinary talk and

thought. And, thinks Sider, presentism does the latter.

I offer the presentist a different (and I think better[25]) reply. I grant that the presentist

must either reject singular propositions about the wholly past and future or reject existentialism.

And I grant that doing the former is costly. But I deny that rejection of existentialism is costly.

De rigueur or not, existentialism is surely false. This is because it has the outrageous implication

that there are no contingent objects. But you and I are contingent objects—we might not have

existed; so existentialism is to be rejected.

Why think that existentialism has this implication? Here is one reason.[26] Suppose for

reductio that there is a contingent object c. Let "F" name some property had by c so that $[Fc]$ is

a true, singular proposition about c. Existentialism, recall, says that:

$$\Box[\forall F \forall y \forall x_1, x_2, \ldots (y = [Fx_1, x_2, \ldots] \rightarrow \Box[\exists z(z=y) \rightarrow_\bullet \exists v_1(v_1=x_1) \bullet \exists v_2(v_2=x_2) \bullet \ldots])].$$

Together with a few truths of modal and quantificational logic, it implies:

(1) $\Box[\exists z(z=[Fc]) \rightarrow \exists v(v=c)]$.

And (1) together with a thesis I'll call the Necessity Thesis implies

(2) $[\exists z(z=[Fc]) \rightarrow \exists v(v=c)]$ is true in every possible world.

The Necessity Thesis says that, for any proposition p, if $\Box p$ then p is true in every possible

world—where p is true in a world W iff, necessarily, were W actual, p would be true. As we'll

see below, this initially plausible thesis is contentious. But let us accept it for now and move on.

(2) together with a thesis I'll call the Truth Thesis implies

(3) $\Box[\exists y(y = [\exists z(z=[Fc]) \rightarrow \exists v(v=c)])]$.

The Truth Thesis says that for any world W and any proposition p, if p is true in W then p exists in W. This thesis is very plausible. For a proposition p is true in W iff, necessarily, were W actual, p would be true. But it's exceedingly hard to see how a proposition could be true without existing. So it seems that, necessarily, were p true, p would exist, and hence that p is true in W iff, necessarily, were W actual, p would exist. That is, p is true in W iff p exists in W. So, if $[\exists z(z=[Fc]) \rightarrow \exists v(v=c)]$ is true in every world, then by the Truth Thesis, we get that it exists in every world—or, alternatively, that, necessarily, it exists.

Now, notice that $[\exists z(z=[Fc]) \rightarrow \exists v(v=c)]$ is a singular proposition about c. Application of existentialism to it yields

(4) $\square[\exists w(w = [\exists z(z=[Fc]) \rightarrow \exists v(v=c)]) \rightarrow \exists v(v=c)]$.

And (4) together with (3) implies

(5) $\square[\exists v(v=c)]$,

the denial of our assumption that c is an object which exists but might not have. This completes our *reductio*.

There is a standard objection to this sort of argument.[27] It starts from the idea that there are two types of necessity, weak and strong. Strong necessity attaches to a proposition p when p is true in every possible world—when p is such that every way things could have turned out is a way in which p is true. A proposition p can be weakly necessary even if it's not the case that no matter how things should've gone, p would have been true—even if it's not the case that p is true in every possible world.

Armed with these two types of necessity, the objector puts the following dilemma against our anti-existentialism argument. The necessity in premise (1)—the claim that $\square[\exists z(z=[Fc]) \rightarrow \exists v(v=c)]$—is either weak or strong. If weak, then the move to premise (2) is illegitimate, since

the Necessity Thesis is false interpreted in terms of weak necessity. Again, it says that for any proposition p, if $\Box p$ then p is true in every world. This is true only when interpreted in terms of strong necessity. But if the necessity in premise (1) is strong necessity, then we've no justification for asserting it. I say that (1) is implied by existentialism. But which necessity is expressed by the embedded "$\Box$" in existentialism? My opponent is likely to insist that it is weak necessity. So read, existentialism does not imply (1).

In brief: (1)'s necessity is either strong or weak. If weak, the inference to premise (2) is illegitimate; if strong, (1) is unmotivated. Either way, the argument is no good.

How strong is this reply to our anti-existentialism argument? *Very* strong, if there is a viable notion of weak necessity in the offing. Thus far we've said only that a proposition can be weakly necessary even if it's not true in every world. But more needs to be said. What exactly is weak necessity?

Here I think my opponent is in trouble. So far as I'm aware, no one has been able to produce an informative analysis of weak necessity. We could take the notion of weak necessity as primitive, but this seems to me a bad way to proceed. A reasonable requirement on the introduction of primitives into the ideology of our theories is that we *understand* them, that we have some grasp on what they are to mean. But I do not understand the notion of primitive weak necessity. I think I understand well enough primitive strong necessity, the sort that attaches to a proposition p when, no matter how things should've gone, p would have been true. Primitive weak necessity, on the other hand, is mysterious to me—and I suspect I'm not alone here.

The usual approach is to analyze weak necessity in terms of Kit Fine's distinction between *inner* and *outer* truth or Robert Adams's distinction between truth *in* a world and truth *at* a world.[28] (Fine and Adams seem to be talking about precisely the same distinction. I'll use

Adams's terminology.) A proposition *p* is true *in* a world *W* iff it is strongly necessarily that *W*

obtains only if *p* exists and is true. But consider the proposition *Socrates does not exist* and let

W_s be a world according to which there is no Socrates. Given existentialism, *Socrates does not*

exist is not true *in* W_s. But still, we want to say, there's a sense in which it accurately describes

what goes on in W_s. The language of truth *at* a world is intended to express the relationship

which holds between a proposition *p* and a world *W* when, whether or not *p* is true *in W*, it

accurately describes what goes on in *W* in the way that *Socrates does not exist* accurately

describes what goes on in W_s.

  The true in/true at distinction in hand, we can analyze weak necessity as truth *at* every

world and think of strong necessity as truth *in* every world. The trouble is that, thus far, we *don't*

have the true in/true at distinction in hand. In particular, we don't have a clear concept of truth

at a world. I suggested that *p* is true at *W* when it accurately describes what goes on in *W,* in the

way that *Socrates does not exist* accurately describes what goes on in W_s. But this isn't terribly

informative. The most obvious sense in which *Socrates does not exist* accurately describes what

goes on in W_s is that, were W_s to be actual, *Socrates does not exist* would be true. But the

existentialist denies that *Socrates does not exist* would be true were W_s actual.[29] What else might

it mean to claim of *Socrates does not exist* that it accurately describes what goes on in W_s? I

have no idea.

  What we need, then, is an informative analysis of truth *at* a world. And this we do not

have. All attempts to analyze the notion of truth at a world I'm aware of either presuppose the

notion of weak necessity or yield wildly counterintuitive results. We could take the notion of

truth at a world as primitive, but here again, this seems to me a bad way to proceed: I, at any rate,

haven't the slightest idea what the notion means.

By my lights, the prospects for a reductive account of weak necessity are bleak. Since I don't understand the notion of weak necessity taken as a primitive (and I suspect no one else does either), I think we're justified in rejecting the foregoing objection to our anti-existentialist argument on the grounds that no one understands its central concept.

There are other ways of replying to our anti-existentialism argument, but none, I think, fares any better than the above line of reply. Existentialism has the outrageous implication that there are no contingent objects. The presentist pays no steep price by rejecting it.[30]

3.2 PRESENTISM AND TRUE SINGULAR PROPOSITIONS ABOUT THE PAST

Here is a truism: the singular proposition that John is tall predicates of John the property *being tall*. As we might put it, the proposition that John is tall bears the *singular predication* relation to John and the property *being tall*. Likewise, the proposition that John is taller than Mary bears the singular predication relation to John, Mary and the *is taller than* relation. I shall take this relation as undefined and presuppose that it is governed by the following principle of singular predication:

(PSP) $\Box[\forall p \forall x s \forall R(p$ singularly predicates R of the $xs \rightarrow \Box[p \rightarrow \exists zs($the zs are the $xs)])]$.[31]

PSP is an exceedingly plausible principle. Could *John is tall* have been true if there were no John? Could John be taller than Mary if there were no John or no Mary? Of course not! (What about *John has the property of non-existence*? Isn't this a counterexample to PSP? I think not. Though it might have been false that John exists, John could not have had the property of non-existence.) PSP is plausible so I shall take it as true. I offer no argument on its behalf since (a) I don't know of any, and (b) if it is false, the objection to presentism I'm about to develop is a non-starter.

PSP makes trouble for the presentist. Consider *Lincoln was tall*. The presentist who rejects existentialism can countenance the *existence* of such a proposition. But given PSP, she can't countenance its *truth*. For *Lincoln was tall*, one thinks, singularly predicates *having been tall* of Lincoln⸻or if it doesn't now, it did. But then given PSP, it entails the existence of Lincoln. Since the presentist does not believe in Lincoln, she must therefore deny that Lincoln was tall. But isn't this crazy? Lincoln was, after all, tall. By the same line of reasoning, the presentist is committed to rejecting all manner of obviously true singular propositions: e.g., *Lincoln was taller than an inch*, *Caroline was born to JFK and Jackie*, *Clinton belongs to the party to which FDR belonged*. If presentism requires us to give up such obvious truths, then so much the worse for presentism.[32]

I reply by denying that the singular propositions of the previous paragraph are obvious truths. Take *Lincoln was tall*. There are two closely related propositions here:

(6) Lincoln was such as to be tall,

where (6) singularly predicates the property of having been tall of Lincoln; and

(7) *WAS*(Lincoln is tall),

where (7) is a *de dicto* proposition predicating past truth of the proposition *Lincoln is tall*. (Note that (7) predicates no property of Lincoln, and given the denial of existentialism, is perfectly compatible with his non-existence.) Since the presentist thinks that our most inclusive domain of quantification no longer includes Lincoln, she must reject (6). But she need not reject (7): given that she denies existentialism, it is perfectly compatible with her ontology.

(7), let us agree, is obviously true, something for which we have prodigious historical evidence. We've many photographs of Lincoln and written records about him which, taken together, make (7) highly likely. What of (6)? Do our many photos of Lincoln and written

records about him make *it* highly likely? They do not. Let *E* be an exhaustive description of those photos and written records which together make it highly likely that (7) is true. Since (6) entails

(8) for some *x*, *x* is, was or will be identical with Lincoln,

we know that (6) is no more likely on *E* than (8). So the question is: how likely is (8) on E? It is not likely at all. Suppose I, a presentist, and you, a four-dimensionalist, have the following philosophical dispute. I grant that it was the case that Lincoln exists, but I deny that he is still included in our most inclusive domain of quantification. That domain, I say, includes only present things; since Lincoln ceased to exist some time ago, our widest quantificational domain no longer includes him. You disagree, insisting that our most inclusive domain of quantification *does* still include Lincoln. Our most inclusive domain includes past, present and future things, you argue, and thus still includes Lincoln.

Now, would it shed any light whatsoever on our dispute to learn of the photos and written records which together make it highly likely that (7) is true? That is, would the truth of *E* confirm your thesis over mine, or vice versa? I should think not. *E* isn't the right sort of evidence for resolving a dispute like ours. It is good evidence indeed for (7). But that claim is not under dispute; we both grant it. Our dispute is over (8), and *E* isn't evidence one way or the other about this. *E*, as we might put it, is evidentially neutral with respect to (8): (8) is as likely as not on *E*. If so, then since (6) entails (8), it follows that (6) is not likely on *E*.

Similar reasoning applies to the other singular propositions considered above. So we've plenty of historical evidence for

(9) Caroline is such that *WAS*(she is born to JFK and Jackie),

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where (9) predicates of Caroline the property of being an x such that the proposition that x is born to JFK and Jackie was true. ((9), notice, is perfectly compatible with presentism. It entails the existence of Caroline and *Caroline is born to JFK and Jackie*, but—given the denial of existentialism—does not entail the existence of JFK and Jackie.) We don't have good evidence, however, for

(10) Caroline bears R to JFK and Jackie,

where R is the relation x bears to y and z iff x was born to y and z. Likewise, we've excellent evidence for

(11) Clinton belongs to a party P such that *WAS*(FDR belongs to P).

But we don't have good evidence at all for

(12) Clinton bears R^* to FDR,

where R^* is the relation x bears to y iff x belongs to a political party to which y belonged.

As best I can tell, PSP does not commit the presentist to the denial of any obviously true singular propositions about the wholly past or future.

3.3 PRESENTISM AND RELATIVITY PHYSICS

It is widely believed that presentism is incompatible with special and general relativity.[33] Since these are paradigmatically successful scientific theories, if presentism *is* incompatible with them, its price is high indeed.

So is there an incompatibility here? Sadly enough, it seems so. Special and general relativity, as usually construed, are spacetime theories: theories which attempt to describe the trajectories of various sorts of physical particle—e.g., free particles, particles acted on by gravity, particles acted by electromagnetic forces—in terms of four-dimensional spacetime models. We can think of a spacetime theory T as having two parts. First, there's a set of equations describing

the trajectories of various types of physical particle. These determine a class of spacetime

models, where each model of *T* is an n-tuple <M, Φ_1, …, Φ_m> such that M is a four-dimensional

manifold of points and Φ_1, …, Φ_m are *geometrical objects* (set theoretical mappings) defined on

M which represent the geometrical structure of M. Second, there's a set of

propositions—following van Fraasen (e.g., 1987), the *theoretical hypotheses* of T—which

describe the relationship between the models of *T* and the spatiotemporal world. On the usual

approach, special and general relativity include a four-dimensionalist theoretical hypothesis,[34] a

proposition to the effect that the models of the theory are either (a) isomorphic representations of

spacetime, the four-dimensional manifold of places-at-a-time in which all spatiotemporal

entities—past, present and future—are embedded, or (b) isomorphs of physically possible

spacetimes.

There is an obvious sense, then, in which presentism is incompatible with special and

general relativity as usually construed: on the standard construal, they postulate the existence of

a four-dimensional spacetime embedding past, present and future entities. The presentist denies

there is such a thing.

But is this a substantive incompatibility? Could we just alter the theoretical hypotheses

of special and general relativity, replacing their four-dimensionalist theoretical hypotheses with a

presentist alternative? The idea would be this. Instead of thinking of the spacetime models of

relativity as isomorphic representations of a four-dimensional spatiotemporal world, we suppose

that only a *part* of each model represents by isomorphism. For each model, we suppose a

foliation or slicing of the model's manifold into a series of three-dimensional spacelike

hypersurfaces. We then construe *one* member of this series as an isomorph of the *three-*

dimensional world; other members of the series are construed as representations of past and

future states of this 3-world. The entire series represents the evolution of the 3-world through time.

To be sure, this is not the usual way of proceeding, but is it a *substantive* departure from orthodox relativity? Most philosophers and physicists, I think, would answer this question in the affirmative. Adding a presentist theoretical hypothesis to relativity requires adding a privileged foliation to our spacetime models: for each model, recall, we specify a particular slicing of the model's manifold into a series of spacelike hyperspaces and think of the resulting series of 3-spaces as uniquely representing the evolution of our 3-world through time. But many would say that adding a preferred foliation to relativity means rejecting both the letter and the spirit of the theory. Einstein's most important insight, it is commonly thought, is the idea that there *is* no privileged foliation of spacetime (or our models thereof), no distinguished way of carving it (them) into spaces and times. Adding a presentist theoretical hypothesis to relativity means rejecting this core insight of Einsteinian relativity.

The upshot: presentism is incompatible with relativity at both a surface and a deeper level. Most philosophers, I think, regard this as a knockdown argument against presentism. If being a presentist requires the rejection of orthodox relativity, then being a presentist is simply too costly.

But what exactly *is* the cost paid by the presentist who adds to relativity a presentist theoretical hypothesis in the way described above? I grant that doing so amounts to the introduction of a preferred foliation, and that this requires abandoning a central principle of relativity. But what precisely is the cost of abandoning this principle? What price do we pay if we add a preferred foliation to our spacetime models?

One worry is that such a foliation is empirically undetectable.[35] Let $<M, \Phi_1, \ldots, \Phi_m>$ be the general relativistic model that (together with a preferred foliation) represents the evolution of our three-dimensional universe through time. The trouble is that we have no way of determining empirically which three-slice of M represents the present state of the world, and hence which foliation of M represents the evolution of the world through time. But, some might suggest, if we've no way of detecting a preferred foliation, we've no business postulating its existence.

But why think this? The suggestion is that there's something untoward about postulating the existence of something we have no way of detecting empirically. But in these post-positivism days, why think that?

One might worry that the postulation of a preferred foliation amounts to the postulation of an explanatorily superfluous entity, since we can formulate kinematic and dynamic laws of motion without recourse to this extra spacetime structure. The price of adding a preferred foliation to relativity, then, is the price paid by any theory which postulates explanatorily superfluous entities.

I reply that even if it were true that the evolution of all physical quantities can be described without recourse to a preferred foliation,[36] it wouldn't follow that a preferred foliation is superfluous *tout court*. For the presentist, a primary function of our spacetime models is to represent the historical development of the three-dimensional universe through time. But they can play this role only if they contain a preferred foliation.

Another worry: relativistic physics and its egalitarianism about reference frames has been highly successful as a physical theory. Doesn't this strongly suggest that it gives us an accurate picture of the structure of spacetime?[37]

By way of reply, this much seems plausible: the success of relativity at predicting and explaining various phenomena strongly suggests that it gives us an accurate picture of the temporal and spatial metrical structure of the universe. But the presentist need not deny this. Let $\langle M, \Phi_1, \ldots, \Phi_m \rangle$ be a general relativistic spacetime model which (together with a preferred foliation) represents the evolution of our 3-world through time. The presentist might suppose (a) that the material world is embedded in an evolving, variably curved 3-space constituted by points at spacelike separation from one another, and (b) that this 3-space successively takes on a metrical structure isomorphic to successive 3-slices of M. She can suppose further that temporal duration in our 3-world is trajectory relative in the way suggested by general relativity, so that the lapse of time measured by any particle p is given by the timelike distance along the curve through M representing p's history. Given these assumptions, the spatial and temporal metrical properties of the presentist's evolving 3-world will be exactly those predicted by general relativity.

So the success of relativity suggests that it gives us an accurate picture of the metrical structure of the universe. Thus far, the presentist can agree. But does it likewise suggest that the correct theoretical hypothesis for relativity is a four-dimensionalist rather than a presentist hypothesis? I can't see why it would. Adding a presentist hypothesis (and thus a preferred foliation) to relativity yields a theory which, given current science, is empirically equivalent to standard relativity. It's hard to see why the modified theory would differ from the standard version in predictive or explanatory power. But if there is no difference on this point between the two theories, then the predictive and explanatory success of standard relativity is no argument against presentistic relativity.

And a final worry: the discussion thus far assumes that relativistic spacetime models can be foliated, that they can be "sliced" into a family of global spacelike hypersurface. But it's a well-known fact about general relativity that not all of its models are capable of foliation. (Gödel (1949), for instance, proposed a widely-discussed model of general relativity which cannot be foliated.) Since adding a presentist theoretical hypothesis to general relativity requires that its models be foliatable, don't we have a problem here?

We do not. For we need not suppose that adding a presentist theoretical hypothesis to general relativity requires that *all* of its models be foliatable. The sensible presentist won't be dogmatic about the logical or even the physical necessity of presentism. She can grant with equanimity that there are logically and even physically possible worlds in which four-dimensionalism is true, and that some of the latter are constituted by spacetimes which can't be sliced into a family of global spacelike hypersurfaces. In such worlds, presentism is false. So what? There would be trouble for the presentist if the spacetime models of *our* world couldn't be foliated. But the usual assumption among physicists is that the models of our world *can* be foliated.[38]

I can't see any reason for thinking that the cost of adding a presentist theoretical hypothesis to relativity is high. Doing so changes the theory in important ways, I grant. But the resulting theory is empirically equivalent to the old theory, and as best I can tell, carries no unacceptable implications.[39]

3.4 Presentism and the Grounding Objection

It is sometimes charged against the presentist that her ontology lacks the resources to *ground* past and future truths.[40] It is a plausible principle that contingent truths like *Lincoln existed* require the existence of some thing or things in the world which *account for*, *ground*, or

make true the truths in question. But what among the present things—which according to the

presentist, exhaust reality—grounds a truth like *Lincoln existed*? Says the objector: nothing. So

presentists face an uncomfortable dilemma: reject the principle that contingent truths need

grounding or give up truths like *Lincoln existed*. Either way, presentism is pricey.

Says the objector: truths require grounding! But what does this talk of *grounding* amount

to? What is it for a truth to be grounded and why do truths need grounding anyway?

A standard answer to these questions proceeds from the *truthmaker axiom*. John Fox

states the principle nicely:

By the truthmaker axiom I mean the axiom that for every truth there is a

truthmaker; by a truthmaker for A, I mean something whose very

existence entails A. (1987, 189)

Some comments. First, to say of a thing *x* that its existence entails some proposition *p* is to say

that every possible world where *x* exists is a world where *p* is true. Second, not every truthmaker

theorist will think that each truth requires a *single* truthmaker. As Greg Restall points out, it's

difficult to see what single thing could make true the proposition that Arvo Pärt's *Magnificat* has

been performed at least three times (1996: 332). Better to say that each truth has a truthmaker or

truthmakers. And third, the role of truthmaker is typically filled by Russellian facts or states of

affairs—non-mereological[41] complexes built-up out of properties, relations and particulars.[42]

These points noted, we can tighten up Fox's formulation of the truthmaker axiom by

stating it thus:

(**Truthmaker**) $\Box[\forall p(p \to \exists xs \Box[\text{the } xs \text{ exist} \to p])]$.

A truth is *grounded*, then, when it has a truthmaker, some thing or things whose existence

entails the truth in question. According to Truthmaker, all truths need truthmakers. Why think

this? Why subscribe to Truthmaker? This is a hard question. Typically, I think, philosophers endorse it because they're committed to a certain version of the correspondence theory of truth. On this version of the theory, whenever something is true, some thing or things in the world make it true. Truthmaker, you might suppose, is a natural way of fleshing this doctrine out.

Given plausible assumptions, Truthmaker spells trouble for the presentist. It is an exceedingly plausible truth about the past that wooly mammoths existed. But, says the objector, what among the present things is such that its existence entails this proposition? Isn't it *possible* that things have been just as they presently are and there have been no wooly mammoths? (For example, isn't it possible that things be just as they presently are except that God created the world five minutes ago?) Of course it is. It follows that nothing among the present things ensures the truth of the proposition that wooly mammoths existed. Given Truthmaker and the presentist's claim that the present things exhuast reality, then, it must not be true that wooly mammoths existed. Indeed, most of what we ordinarily take to be true about the past and future looks to be called into question by this line of reasoning. If the presentist must reject most of what we hold true about the past and future, so much the worse for presentism.

As it stands, however, Truthmaker is controversial. What of truths like *all ravens are black* or *there are no unicorns*? Is there some thing whose existence entails the truth of these claims? Many join David Lewis in supposing that such truths "are true not because things of some kind *do* exist, but rather because counterexamples *don't* exist" (1992: 216).

Consider too truths like *John is tall*. John's existence doesn't entail it; nor does the joint existence of John and the property *being tall*. So what does? The usual story has it that the fact *John's being tall*—the non-mereological fusion of John and the property *being tall*—does the job. But what could these non-mereological fusions be? It's not at all obvious that there are

such things. Without them, though, the truth that John is tall looks to be a counterinstance to Truthmaker.

So Truthmaker is controversial. Should the presentist reject it? I don't know, but it doesn't really matter since there is a less controversial version of Truthmaker, one which works just as well in an objection to presentism and is vastly more difficult to deny.

David Lewis (2001: 609ff) and John Bigelow (1988: 133) formulate this weaker version of Truthmaker as the claim that *truth supervenes on being*, where this means that truth supervenes on what things there are, the properties they instantiate, and the relations they enter into. Put differently: there could be no difference in what is true without there also being a difference in what things exist and which properties and relations they instantiate. Regimented in terms of possible worlds, this principle becomes

> **(Supervenience)** For any proposition p and worlds w and w^*, if p is true in w and not in w^*, then (a) according to w, something exists in it but not in w^* (or vice versa), or (b) according to w, some objects instantiate a property or relation in it but not in w^* (or vice versa).[43]

Supervenience looks, on reflection, to be obviously true—so obvious as to be trivial. Consider what it would take for the principle to be false. It would fail if (a) there were distinct worlds w_1 and w_2 such that, according to each, the very same things exist in w_1 as in w_2 and instantiate the very same relations and properties in w_1 as they do in w_2, but (b) for some proposition p, p is true in w_1 but not in w_2. But are two worlds in which the very same things exist, exemplifying the same properties and relations really *two*? It's a plausible principle, I think, that for any possible worlds w_1 and w_2, w_1 is distinct from w_2 iff w_1 represents what things exist and which properties and relations they instantiate differently than w_2.[44] Given this

principle, Supervenience is trivial since no possible world *w* and no proposition *p* are such that *p* is true and not true in *w*.

So Supervenience is plausible, indeed trivial. But presentism looks to contravene it. Again, it's an obvious truth that wooly mammoths existed. Since present things could have been just as they are and wooly mammoths not have existed, this truth does not supervene on what present things there are and which properties and relations they instantiate. But according to presentism, the present things exhaust reality. So this truth does not supervene on what things there are and which properties and relations they instantiate. So given presentism, Supervenience is false. So much the worse, then, for presentism.

Let us say that the foregoing bit of reasoning captures the grounding objection to presentism. As stated, the objection depends on two principles, Supervenience and a principle I shall call *Temporal Combinatorialism*, the principle that

Things could have been just as they are at present and the past have been different.

Presentists will likely object to the latter. Let me briefly say something about two ways of doing so.

First way: *Obviously* things could not have been just as they are and the past have been different because among the present things are propositions about the past—e.g., *dinosaurs roamed the earth*—and among their properties are properties like *being true*. Surely things couldn't have been presently such that this very proposition has the truth-value it does and dinosaurs not have roamed the earth! Likewise for all other truths about the past. Temporal Combinatorialism is trivially false.

True enough. But this isn't a very satisfying objection. Temporal Combinatorialism is easily reformulated so as to avoid this problem. When the skeptic proposes that things could have been just as they are and the past different, she presumably does not mean to suggest that propositions about the past could have had the same truth-values and the past have been different. The principle she has in mind is something more like

> **(Temporal Combinatorialism')** Things could have been just as they are at present (ignoring the present distribution of truth and falsity and grue-like properties defined from truth and falsity using quantifiers, Boolean operators and the like[45]) and the past have been different.

Though I think this principle is false, it's not obviously false in the way that Temporal Combinatorialism is.

Recall the logic of the grounding objection: things could have been just as they are and the past different (Temporal Combinatorialism); so past truths (or many of them at any rate) don't supervene on the present things, their properties and relations; so, given presentism, they don't supervene on being; so, given presentism, Supervenience is false. But given our reformulated principle of Temporal Combinatorialism, this argument no longer works. The trouble occurs at the step from Temporal Combinatorialism' to the claim that past truths don't supervene on present things, their properties and relations ("the present" for short). It's of course consistent with Temporal Combinatorialism' that past truths *do* supervene on the present (Temporal Combinatorialism' only gives us that past truths don't supervene on the present *ignoring the present distribution of truth and falsity and grue-like properties built from them*).

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No deep problem here, though; the argument is easily repaired. The guiding intuition behind Supervenience is that possible worlds which disagree about which propositions are true won't disagree *only* about which propositions are true. Worlds that disagree about truths, one thinks, will also disagree about which things exist and/or which properties (other than *being true*, *being false* and the like) they instantiate. We might restate the principle, then, as something like:

> **(Supervenience')** For any proposition p and worlds w and w^*, if p is true in w and not in w^*, then (a) according to w, something exists in it but not in w^* (or vice versa), or (b) according to w, some objects instantiate a property or relation (other than truth and falsity and grue-like properties built from them) in it but not in w^* (or vice versa).

This principle is a bit more contentious than Supervenience. Some might suppose that there are *brute* truths: roughly, true propositions such that there are worlds which disagree with ours, grue-like properties aside, only about the truth of these propositions. For example, maybe there are worlds which differ from ours just in the truth-values they assign brute counterfactuals of chance, or brute counterfactuals of freedom.

I don't know of a good argument that there aren't such brute truths. It does seem exceedingly strange, though, that truths about the past and future should be such truths. The truth that I have hair is not brute—worlds in which it is false that I have hair will represent various of my properties differently than does the actual world. A hundred years from now, it will be true that I had hair. Isn't it odd that *that* truth should be brute?

Maybe you're a presentist and see no problem with past and future truths being brute in this way. I know of no good argument that you're wrong. Since I don't share your views, though, and I should like to remain neutral on the question whether there are brute truths, it

would be nice for me if there were a way for the presentist to reject our revised Temporal Combinatorialism while accepting Supervenience'. And, there is.

Second way: Presentists with certain metaphysical commitments have a well-motivated objection to Temporal Combinatorialism' (henceforth, "Temporal Combinatorialism"). A few comments about the sort of metaphysical commitments I have in mind. Start with the possible worlds picture of things. Realists about possible worlds take possible worlds talk literally in that they believe reality to be populated by *possible worlds*. Talk of such things is not merely heuristic; it is literal truth. Possible worlds realists of course disagree about what these things are: some say maximal possible states of affairs or propositions, others, maximal consistent sets of propositions; at least one philosopher, famously, thinks of them as maximally spatiotemporally connected physical objects.[46]

Let us call the philosopher who takes possible worlds talk literally a *possible worlds realist*. To sharpen the view, I'll set aside that brand of possible worlds realism peculiar to Lewis according to which possible worlds are big physical objects. We'll think of the possible worlds realist as one committed to the existence of *abstract* possible worlds.

Those who take possible worlds talk literally often talk of a binary *logical accessibility* relation defined on the set of possible worlds. The idea here is that a proposition is possible iff it is true in some world *logically accessible* from ours. There is disagreement, of course, about the formal properties of this accessibility relation. Let us set those aside, though, and add to our characterization of possible worlds realism commitment to a binary logical accessibility relation defined on the possible worlds.

A. N. Prior,[47] Roderick Chisholm,[48] and Edward Zalta[49] think of *moments of time* as abstract objects. Times, on this view, are, like possible worlds, abstract representations:

intuitively, they are abstract representations of an instantaneous state of the world. Thinking of times in this way will be very attractive to the presentist, especially to the presentist who is also a possible worlds realist. Supposing that there are such things, like supposing that there are possible worlds, offers the presentist great gain in, to borrow David Lewis's phrase, unity and economy of theory. As worlds enable us to give an economical theory of modal talk, times enable us to give an economical theory of temporal talk, and much more besides. If you're a presentistic possible worlds realist because you like the theoretical payoffs of your possible worlds realism, then you'll likely be attracted to abstract time realism for the same reasons.

Of the many times there are, one has the distinction of being the present time. (Just as, of the many possible worlds there are, one has the distinction of being the actual world.) Among the times which aren't present, some are past and some are future. What makes for a time's being past or being future? The possible worlds realist, impressed by the similarities between worlds and times, might suppose that what makes for a time's being past is similar to what makes for a world's being possible. A world is possible for us when it bears the *logical* accessibility relation to our world. So too, we can say, a time is past or future for us when it bears the *temporal* accessibility relation to our time. If we take this relation to carry a direction, we can say that a time is past when it is *backwardly* temporally accessible and future when it is *forwardly* temporally accessible. More simply, we can say that a time is past when it is *earlier than* the present time and future when it is *later than* the present time.

Let us call the philosopher who believes in such abstract times and an earlier/later relation linking them an *abstract time realist*. Now, notice this crucial point. The abstract time realist will deny Temporal Combinatorialism. This principle, recall, says that things could have been just as they are at present (ignoring the distribution of truth, falsity and the like) and the

past different. Not so, if you're an abstract time realist: you believe that among the present things are abstract times standing in their earlier/later relations to one another. But these things could not have been just as they are, bearing just the earlier/later relations they bear to one another, and the past have been different. According to the abstract time realist, for any proposition p, necessarily, it was the case that p iff, according to a past (i.e., earlier) time, p. (Truths about the past, on this view, are similar to modal truths: for any p, it's possibly the case that p iff, according to a possible world, p.) So, for example, it was the case that I graduated from college. Says the abstract time realist: this iff, according to an earlier time t, I graduated from college. Since the way things presently are includes t's bearing the earlier relation to the present time (and, we shall assume, times, like worlds, have their representational properties essentially), it follows that things could not have been just as they presently are and its not be the case that I graduated from college.

So the presentistic abstract time realist will reject Temporal Combinatorialism and be unimpressed by the grounding objection. Moreover, if you're already a possible worlds realist, abstract time realism costs you almost nothing in ontology. True, you need times and the temporal accessibility relation, but for the possible worlds realist, these represent little by way of theoretical outlay. If you believe in worlds you probably already believe in times: if you're ontologically committed to maximal ways things could be, then you're likely also committed to maximal ways things were, are or will be. Temporal accessibility represents a real addition to the possible worlds picture, but not, I think, a costly one. This relation, recall, is merely an earlier/later relation defined on abstract times. Most any ontology suitable to our temporal world will include some sort of primitive temporal ordering relation. True, my earlier/later relation is

defined on abstract times; the usual story casts the earlier/later relation as a relation on *concrete* times (or maybe events). But this isn't obviously a demerit for my relation.

In conclusion, then, presentists with room enough in their ontologies for abstract worlds and times will be unimpressed by the grounding objection.

4. CONCLUSION

The foregoing objections to presentism are, I think, the most damaging. On balance, they fail to demonstrate much by way of theoretical cost. Presentism is not a costly doctrine. Since it's the only metaphysic of time consistent with the metaphysical and linguistic commitments adumbrated in the second section of this article, those of us who find these commitments attractive have good reason for being presentists.[50]

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[1] The term "four-dimensionalism" is sometimes used as a name for the thesis that things persist through time by having temporal parts or stages located at different times. I'll use the term "perdurantism" as a name for that thesis and reserve "four-dimensionalism" as a name for the thesis that there are past, present and future entities. Also, "eternalism" is sometimes used as a name for the view that all propositions have their truth values *eternally* (a proposition has its truth value eternally if it is either always true or never true). I shall not use it in this way. The thesis named by my "eternalism"—the thesis that reality includes past, present and future entities—is interestingly independent of the thesis that propositions have their truth values eternally.

[2] For purposes of this article, I shall presuppose an unrestricted mereology. On this view, very roughly, any objects, the *x*s, no matter their relations to one another, compose another object *y* such that *y* is the mereological sum or fusion of the *x*s.

[3] I shall assume that, necessarily, there are *events*, things which *happen*, *occur* or *take place*. I'll say more below about what I take these to be.

[4] Lawrence Lombard makes this complaint (or something very close to it) in 1999: 254-255, as does Craig Callender in 2000: S588-S589. For discussion, see Sider (1999: 325-327); Zimmerman (1998b: 209-210); Merricks (1995: 523; 1999: 421-422); Hinchliff (2000: S576-S577); and Rea (2003).

[5] See for instance Smith (1993: Chap. 6); Tichy (1980: 177-179).

[6] Here and in the sequel I employ the past tense operator of tense logic. ⌜*WAS*(S)⌝ abbreviates ⌜it was the case that S⌝.

[7] Recent endurantists include Haslanger (1989a, 1989b, 1994); Hinchliff (1996, 2000); Johnson (1987, 1992); Lowe (1987, 1988); Mellor (1981, 1998); Merricks (1994, 1999); Rea (1995, 1998, 2000); van Inwagen (1990); and Zimmerman (1997, 1998a, 1998b, 1999). For discussion, see Sider (2001).

[8] This way of putting the notion of endurance is fine for present purposes. But, one might wonder, what is it for a thing to have no temporal extent, to not be "spread out" in time in the way that the spatiotemporal objects of common sense are "spread out" in space? Answering this question turns out to be surprisingly difficult. For discussion, see Merricks (1999) and Sider (2001).

[9] An *instantaneous temporal part* or *stage* of a thing *x*, roughly, is a part of *x* such that (i) it is located at and only at an instant *t*, and (ii) it overlaps everything which is a part of *x* at *t*. (Here I follow Sider (2001: Chap. 3).)

[10] Recent adherents include: Armstrong (1980); Balashov (1999, 2000); Heller (1984, 1990, 1992, 1993); Hudson (1999, 2001); Lewis (1983a, 1986, 1988); and Quine (1960, 1963, 1976, 1981). For discussion, see Sider (2001).

[11] This view has been defended recently by Theodore Sider (1996, 2000, 2001).

[12] For discussion of what, besides linguistic convention, fixes meaning, see Lewis (1983b, 1984) and Sider (2001, Introduction).

[13] Broad's growing block theory (1923) is a version of dynamic eternalism. See too Tooley (1997) and McCall (1994).

[14] See Armstrong (1978a, 1978b).

[15] For simplicity, I'll put the Change Thesis in terms of relations and drop talk of monadic properties.

[16] Cf. Lewis (1986: 201).

[17] See, for instance, Mellor (1981: 111). There are other options. You might think that a thing is *F* at *t* iff it has the relativized or time-indexed property *being-F-at-t* (cf. van Inwagen (1990: 247); for discussion, see Hinchliff (1996), Merricks (1994) and Rea (1998)). Others propose that a thing is *F* at *t* iff it bears the three-term instantiation relation to *being F* and *t* (cf. van Inwagen (1990: 247) and Johnston (1987: 127-129); for discussion, see Hinchliff (1996), Merricks (1994), Lewis (1988), Haslanger (1989), and Rea (1998).)

[18] Chisholm (1990).

[19] An option I do not consider is rejecting Chisholm's theory of events. I set this option aside since essentially the same argument can be run without Chisholm's theory. See, e.g., Sider (2001: Chap. 2).

[20] See, for instance, Fitch (1994). For discussion, see Markosian (forthcoming), Sider (1999) and Rea (2003).

[21] Plantinga (1983).

[22] Bealer (1982).

[23] For ease of exposition, I employ second-order quantification (quantification into the predicate position), but everything I say is easily re-cast in terms of a first-order language.

[24] See, for instance, Markosian (forthcoming) and (for a non-presentist reply on behalf of the present) Sider (1999).

[25] Sider's notion of quasi-truth raises interesting questions. For instance, he seems to suggest that a sentence *S* is quasi-true iff it satisfies an instance of the following schema:

> *S* is quasi-true iff there is a true proposition *p* such that, were *O* true, *p* would have been true and would have entailed the truth of *S*,

where *O* states some thesis of ontology like presentism, four-dimensionalism or realism about propositions (1999: 343-347). But consider this thesis of ontology: goblinism, the thesis that there are necessary, nefarious beings—Goblins—bent on the destruction of humanity. Goblinism is, if true, necessarily true. Consider the proposition that Goblins would have existed were goblinism true. This proposition is true, would have been true had goblinism been true, and would have entailed the truth of "Goblins exist." Thus, by Sider's definition, "Goblins exist" is quasi-true.

Now I'm unclear on what the benefits of quasi-truth are. The idea is supposed to be that ordinary thought and talk are respected if we show them to be quasi-true. But do we really respect ordinary talk and thought if they

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turn out on our theory to be no better off than claims like "Goblins exist"? You tell me that "Lincoln was more than an inch tall" is not true. How does it help assuage my incredulity by reassuring me that, although this sentence isn't true, it is quasi-true, in just the same way that "Goblins exist" is?

[26] The essentials of the argument to follow are found in Plantinga (1983); see too Bealer (1993, 1998).

[27] For a formidable version of this objection, see Fine (1985).

[28] See Fine (1981: 196-201; 1985: 163) and Adams (1981).

[29] Well, at any rate, the existentialist *should* deny that *Socrates does not exist* would be true were W_s actual. She does deny that this proposition would *exist* were W_s actual. I suppose she could think, however, that *Socrates does not exist* would be true but non-existent were W_s actual. But this is a counterintuitive view—*very* counterintuitive. How could a proposition manage to be true but fail to exist? Isn't this like supposing that Fred could fail to exist but nevertheless manage to be fat?

[30] What's to say, then, about the popular view of singular propositions on which they are complexes built-up out of properties, relations and the objects they are about? Though there are various approaches one could take, the best way to be an anti-existentialist, I think, is found in Bealer (1998). On this view, propositions—singular or no—are *sui generis* abstract entities which have no parts, members or constituents. They do not represent by virtue of their structure; they have none. Rather, they represent by virtue of various primitive logical relations—e.g., singular predication—they bear to *inter alia* one another, concrete objects, properties and relations. See Bealer (1998) for further discussion.

[31] Here I employ *plural* quantification. For the uninitiated, "$\forall xs(Fxs)$" may be thought of as an abbreviation for "it is true of any things whatsoever that they are such that they are F"; "$\forall xs \forall y(xsRy)$" may be read as "it is true of any things$_x$ whatsoever that they$_x$ are such that it is true of any thing$_y$ whatsoever that it$_y$ is such that they$_x$ bear R to it$_y$." (In the latter case, we index variables to our pronouns to make clear which pronouns go together.) For discussion, see van Inwagen (1990, 25-28).

[32] A similar argument can be run with non-singular propositions like *the 14th president of the U.S. was inaugurated before the 23rd president of the U.S.* and an analogue of PSP built for descriptive propositions. I'll treat only the singular proposition version of the argument; what I say in the sequel applies equally well, I think, to the argument framed in terms of descriptive propositions.

[33] For discussion, see Godfrey-Smith (1979); Sider (2001: 42-52); Monton (unpublished); Putnam (1967), Reitdijk (1966 and 1976), Maxwell (1985); Sklar (1974, 1981); Rietdijk (1966, 1976); Rea (1998); Stein (1968, 1970, 1991), Savitt (1994, 2000); Hinchcliff (1996; 2000); and Callender (2000).

[34] I borrow this way of putting things from Monton (unpublished).

[35] For discussion, see Maudlin (1996: 295-296).

[36] Whether the evolution of *all* physical quantities can be described without appeal to a preferred foliation is a matter of controversy. If Bohmians like Maudlin (1996) are right, or if some version of fixed foliation quantum gravity turns out to be right (see Monton, unpublished), the evolution of at least some quantities *does* depend on a privileged foliation.

[37] Maudlin (1996, 296-298).

[38] The reader should note that most presentists think of presentism as necessarily true if true. If they're right, my response to the previous paragraph's worry is in trouble. Since I am not inclined to regard presentism as a necessary truth, however, I shall not worry about this.

[39] For a related approach to these issues, see Craig (2001).

[40] See, for example, Sider (2001, chap. 2). For discussion, see Keller (forthcoming); Bigelow (1996) and Rea (2003).

[41] So Armstrong: "States of affairs hold their constituents together in a non-mereological form of composition, a form of composition that even allows the possibility of having different states of affairs with identical constituents" (1997: 118).

[42] Though, for an alternative ontology for truthmakers, see Mulligan, Simons and Smith (1984).

[43] cf. Lewis (2001: 612).

[44] Alternatively: it's a plausible principle that no two worlds are logically equivalent.

[45] Why include grue-like (grue: for some future time t, the property of being observed to be green before t or observed to be blue after t) properties built from truth and falsity using quantifiers, Boolean operators and the like? Else we get obvious counterexamples to our restricted version of Temporal Combinatorialism involving properties like *being true or a round square*.

[46] Here, of course, I speak of Lewis (see, e.g., 1986).

[47] Prior and Fine (1977).

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