

# Temporary Safety Hazards

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## Abstract

The *Epistemic Objection* says that certain theories of time (like the “growing block” and “moving spotlight”) imply that it is impossible to know which time is absolutely present. Standard presentations of the Epistemic Objection are elliptical—and some of the most natural premises one might fill in to complete the argument end up leading to radical skepticism. But there is a way of filling in the details which avoids this problem, using epistemic safety. The new version has two interesting upshots. First, while Ross Cameron alleges that the Epistemic Objection applies to *presentism* as much as to theories like the growing block, the safety version does not overgeneralize this way. Second, the Epistemic Objection *does* generalize in a different, overlooked way. The safety objection is a serious problem for a widely held combination of views: “propositional temporalism” (objects of belief change truth-value) together with “metaphysical eternalism” (the world does not objectively privilege any particular time).

I took time very seriously in those years,  
if I remember accurately.

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Louise Glück, “Aubade”

## 1 Present Danger

According to certain metaphysics of time, we are in danger. Consider this particular location in time—the bit of it in which you and all your nearest and dearest live. It enjoys a special feature, the illumination of presence. But our lives, our loves—and our beliefs—are borne back ceaselessly into the past. When beliefs about what is *present* are borne into the past, they are borne into error. These errors are too close for comfort: we can’t hold ourselves above the mistakes of the generations of past people who live

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in darkness, but tragically believe themselves to be illuminated. What evidence do we have that we aren't in that very predicament ourselves?

Two views are standardly charged with endangering our beliefs this way. One is the Growing Block (GB for short): “the past is just as real as the present”, but “the future is nothing at all” (Broad 1923, 66; see also Adams 1986; Forrest 2006). One time is *absolutely present*: it is the edge of reality. Another is the Moving Spotlight (MS): the past, present, and future are equally “real”, but even so our present location in time enjoys an objective distinction from the rest—it is *absolutely present*, whatever exactly this comes to (Cameron forthcoming; see also Zimmerman 2005 for discussion). For now, let's focus on the sort of Growing Block view held by Broad. Later on (Sections 4–6) we'll look at how things go for other views.

Here's the standard objection to GB—call it the Epistemic Objection—as David Braddon-Mitchell poses it:

A little over 2000 years ago Caesar is crossing the Rubicon, believing he is doing so in the present. He is wrong. Of course once he was right: there was a time when ... he was crossing the Rubicon in the present. But that time is gone. ... That then should lead us to wonder how we know that the current moment is in the present. From my current perspective I know that Caesar is in the objective past. But do I have any reason to believe that I am in the objective present? (2004, 200)

The answer, the objection goes, is no. GB implies that the absolutely present time isn't distinctive enough for anyone to be able to tell it apart from its past. (See also Bourne 2002; Merricks 2006.)

This objection has not been presented cogently. It's not clear from existing presentations how the details of the argument are supposed to go—how it might show that even those who happen to have true beliefs about the absolute present still lack knowledge. The most obvious ways of trying to fill in the missing premises, from hints these standard presentations give, would end up denying us all sorts of ordinary knowledge. Such skeptical principles do have tantalizing appeal, and I don't exactly want to dismiss them—but if they are right, the trouble is sweeping, rather than distinctively threatening our knowledge of time. There is, though, a version of the argument free of this skeptical baggage, which I present in Section 3. This argument uses a premise about epistemic *safety*. Views like Broad's imply that beliefs about absolute presence are at best precariously true: since they are in danger of error, they don't amount to knowledge.<sup>1</sup>

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<sup>1</sup>Ross Cameron (forthcoming, chap. 1) also considers—and rejects—the idea that “considerations of reliability or safety defeat the epistemic goodness [of the Moving Spotlighter's claim that they are present] and hence the non-presentist's claims to knowledge are undermined” (p. 22). The version of

Filling in these details might seem a bit like quibbling; but it's worth our while to get clear on how the best version of the Epistemic Objection works. This will help us evaluate which theories of time are vulnerable to it, and why. For one, it's commonly thought that the *presentist* has no trouble with the Epistemic Objection—but the usual reason given for this turns out to be off the mark. This is pressing because Ross Cameron (forthcoming, chap. 1) has pointed out that if the standard presentist reply worked, it would also help views like GB and MS. But the standard reply doesn't work. There is a better reason for why presentism escapes the objection, but this reason doesn't apply so widely.

It is also commonly thought that the Epistemic Objection is no trouble for “metaphysical eternalists” (or “B-theorists”, or “four-dimensionalists”), who hold that reality considered as a whole, in itself, does not change. But many of these philosophers are also “propositional temporalists”, who hold that certain objects of belief *do* change in truth value. (These are “temporally self-locating beliefs”.) This eternalist/temporalist hybrid view *is* vulnerable to the Epistemic Objection—for the very same reasons as Moving Spotlight views are.

Another reason I'm interested in this project is that clarifying the Epistemic Objection to these theories of time can illuminate how epistemic arguments against metaphysical theories work more generally. Other cases include the Leibnizian “shift” and “boost” arguments against absolute space and motion, Shamik Dasgupta's argument against fundamental individuals, and an objection to presentism from relativistic physics, among others.<sup>2</sup> Clarifying the temporal instance should also help with the others—at least, that's my hope.

## 2 Ignorance and Evidence

The Epistemic Objection charges GB with this implication:<sup>3</sup>

**Unknown.** Nobody ever knows which time is absolutely present.

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the argument I'll give is a bit different from his, though it's based on the same idea; I've set it up to be particularly sensitive to the issues about temporary ontology I address in Sections 4 and 6. I consider Cameron's reply in Section 5.

<sup>2</sup>On space and motion, see Pooley (manuscript). On individuals, see Dasgupta (2009). On presentism, the epistemic angle isn't usually emphasized—I hope to expand on this point in future work; but see Zimmerman (2011).

<sup>3</sup>The arguments are often given for stronger claims about the extremely low *probability* that this particular time is absolutely present—I'll return to this. Any argument for the low probability claim is also an argument for Unknown, since it couldn't be *both* extremely unlikely for us that *t* is absolutely present, and also something we know to be the case.

Why would this consequence be a problem?<sup>4</sup> Here’s how Trenton Merricks presses the point (2006). Either *absolute presence* is the same feature of times we ordinarily recognize as being present—what we call “now”—or else it isn’t. If it is the same, then Unknown seems awful. Our beliefs about our present bodies, thoughts, and activities are as Moorean as we might hope to find: if a metaphysical hypothesis implies ignorance about these mundane matters, *modus tollens* looks like a great move.<sup>5</sup> But if absolute presence *isn’t* ordinary presence, then a theory about it is only “motivated by conflation” (Merricks 2006, §3). None of our usual judgments about, say, the openness of the future have anything to do with what comes after this misleadingly named “absolute present” time.

Let’s take it for granted that Unknown is bad news. Why would GB imply Unknown? The intuitive idea is clear enough. Consider Grover the Growing Blocker, who is contemplating this particular time, and believes it is absolutely present. According to GB, this moment of quiet contemplation lingers on even as reality grows. But the belief is only true when it first comes into being; after that, the very same contemplation will recede into reality’s temporal interior—and thus the belief will be false. There isn’t any intrinsic difference between what that contemplation is like while the belief is true, and what it will be like when the block has grown.

But how do we get from here to Unknown? Bourne, Braddon-Mitchell, and Merricks aren’t explicit about this. Here are a few natural ideas suggested by what they say.

One way turns on similarity between past and present qualitative experience. Bourne writes, “[S]ubjective experience . . . is not an infallible guide to \*presentness\*, for if it were, then Plato’s experience would have to be qualitatively different from our own, yet it is clear there is no identifiable difference, nothing that we can call a manifestation of such experience” (Bourne 2002, 360). Likewise Merricks writes, “But the *intrinsic nature* of those thoughts never changes. So *what it is like* to be Nero sitting in the

<sup>4</sup>Here’s a difficulty. Suppose I say, “Let Tim be the absolutely present time.” Then if I can know that there is any absolutely present time, I can know which time it is—it’s Tim! I think the right thing to say (see Hawthorne and Manley 2012, chap. 3) is that “know which” claims are context-sensitive; it isn’t too difficult to get into a context where this cheesy move suffices for the truth of “I know which time it is”, but we just need to make clear that we are not speaking in such a context. We should understand Unknown as ruling out knowledge of the time presented under some “good guise”, such as a demonstrative or a date. It’s hard to say in general which guises are “good”, but we don’t need to do this here. (For other related arguments about ignorance of space-time structure the issue is less tractable: see Dasgupta manuscript for discussion.)

<sup>5</sup>That was a bit quick. Water is H<sub>2</sub>O, but perhaps it doesn’t follow that anyone who knows they are drinking water knows they are drinking H<sub>2</sub>O. Similarly, even if absolute presence *is* ordinary presence, ignorance about absolute presence may not imply ignorance about ordinary presence. Still, Unknown at least implies that no one can ever *know* that ordinary presence is absolute presence, while retaining their knowledge of which time is present and their recognition of an instance of Leibniz’s law. That seems bad enough.

Colosseum is the same whether that sitting is present or past” (Merricks 2006, original emphasis). How would we get from these observations to Unknown? This is the most obvious enthymematic premise:

**Experience.** If what your qualitative experience is like is compatible with  $P$  being false, then you don’t know  $P$ .

But Experience implies radical skepticism. Grover’s qualitative experience is also compatible with being a brain in a vat. There is debate over whether Grover knows he is not a brain in a vat—but if he does not, then the skeptical problem for GB is the least of his worries. So Experience is not a suitable premise for an objection to GB.

Furthermore, Grover can take advantage of familiar replies to the radical skeptic. For instance: *evidence* is not determined by qualitative experience (e.g. Williamson 2002b, chap. 8 and 9). Grover has evidence that he has hands: he can feel them and see them. Grover’s envatted counterpart Bryn has no such evidence: Bryn merely seems to feel and see hands, but in fact has no hands to be felt or seen. The difference between feeling hands and merely seeming to feel hands is not a difference just in “what it is like” for either of them: it is partly a matter of having hands. In light of that, couldn’t Grover presently have evidence that past believers lack? Maybe Grover gets evidence by *recognizing* absolute presence (perceptually? intuitively?) in a way that necessarily involves *being* absolutely present—just as the evidence Grover gets by feeling his hands necessarily involves having hands. For the Epistemic Objection to work, it needs to show that Grover doesn’t have evidence like this.

These presentations alternatively suggest that a principle about probability might be doing the work. Braddon-Mitchell writes:

[T]o *know* that our current location is the objective present we would need to know that there is no future-directed volume, and we have no independent access to this. So by a principle of indifference we should regard all alternatives as equally likely. So we should regard the hypothesis that the current moment is present as one among very many equally likely ones. So we should conclude, therefore, that the current moment is almost certainly in the past (2004, 200–201).

Likewise Merricks:

After all, given growing block, once you have a thought, you continue to have that thought forever. The thought is on the growing edge of being for just the briefest moment and thereafter and forever not on the growing edge. As a result, the probability that your thought is on the growing edge is vanishingly small.

But indifference principles only apply when all of the various possibilities in question are compatible with your evidence (if they ever apply—see Fraassen 1989, chap. 12, for discussion of the famous difficulties). There can be lots of bad cases and very few good ones without any threat to knowledge or high probability, if your evidence rules out the bad cases. What is needed, and what is lacking, is an argument for parity of evidence in this case: that Grover has no relevant evidence now that he will lose when the block grows. (Again, this doesn't follow from mere sameness of qualitative experience!)

One more try. Another way of pressing the point uses a principle about disagreement. Grover isn't epistemically superior to Plato—Grover is (at best) Plato's *epistemic peer*. And Plato disagrees with Grover about which time is present. Then we might use this principle:

**Conciliation.** If your epistemic peers believe not- $P$ , then you don't know  $P$ .

Conciliation is disputed. (For a start, see Elga 2007; Lackey 2008.) In any case, it doesn't help here. Being an epistemic peer in the relevant sense isn't just about how smart you are, but also about what evidence you have. If Grover has relevant kinds of evidence that Plato lacks, then Plato isn't his peer, despite his general intellectual standing. But once again, parity of evidence needs to be argued for in this case.

Disagreement can call our beliefs into question, but when it does, it's because it shows that our beliefs are flawed in some other way. The disagreement of your peers can make vivid the fact that you could easily have believed what they do—and thus even if your belief is true, it was in *danger* of being false. When that danger is present, it doesn't especially matter whether there are actual disagreeing peers around to make it vivid. Let's take up that idea now.

### 3 Dangerous Times

If you easily could have believed falsely, your belief isn't safe from error; in that case you don't know.<sup>6</sup>

**Safety.** If you know  $P$ , then necessarily: if anyone *closely believes*  $P$ , then  $P$  is true.

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<sup>6</sup>A slightly different way to go would be to argue that *evidence* must be safe, rather than *knowledge*. This would then provide the missing argument against relevant temporary evidence that isn't shared between present and past believers, at which point we could try again with an appeal to indifference principles or disagreement.

For defense of this premise see Sosa (1999); Williamson (2002b), ch. 5; Pritchard (2005).<sup>7</sup> One thing to note is that more familiar formulations of safety principles put things in terms of whether there are close possible cases of error. But this promiscuous quantification over “cases” is potentially a source of confusion when temporary (and contingent) ontology is at issue. So officially I’ll use this slightly more cumbersome adverbial version: instead of asking whether *there are close possible cases of belief*, I’ll ask whether *possibly someone believes closely*.

What is closeness? The idea is that a close belief has a sufficiently similar basis to yours. This is rough, and it may well be impossible to elucidate closeness without eventually appealing back to knowledge. But we can still make good judgments in lots of cases. “Basis” is used in an extended sense: a belief’s basis isn’t generally “in the head”. Possible believers in situations with importantly different environments, or causal laws, or underlying metaphysics, typically don’t count as close. Thus safety doesn’t have the skeptical consequences of principles like Experience. The metaphysical possibility of envatted false believers with the same qualitative experience is no reason to think that such cases are *close*. The beliefs of the envatted are very different from normal cases in their situation, their causal role, and even their content. Thus their predicament normally poses no danger to us.<sup>8</sup>

Grover believes that *t* is absolutely present. Suppose for the sake of argument that this belief is true. Even so, it lingers. It will continue to be the case that someone believes that *t* is absolutely present. That belief will have just the same basis as Grover’s belief has now. So it is close. But also, since *t* won’t always be absolutely present, that belief won’t always be true. So there will be a close case of false belief, and Grover’s belief is unsafe.

Let’s make that argument explicit. Suppose GB, and let *P* be the proposition that *t* is absolutely present, which Grover believes. (Note, though, that the argument works the same way for any proposition Grover believes which won’t always be true.) “Closely” here means close to Grover’s belief as it (actually, presently) is.

- (1) **Safety.** If Grover knows *P*, then necessarily: if anyone closely believes *P*, then *P* is true.
- (2) **Reflexivity.** Grover closely believes *P*.
- (3) **Permanent Belief.** If someone closely believes *P*, then it will always be the case that someone closely believes *P*.

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<sup>7</sup>In general, beliefs in propositions other than *P* can count as close, which helps account for unsafe beliefs in necessary truths, for instance. We can ignore that complication: the weaker safety principle I’ve given here will suffice for the argument.

<sup>8</sup>In this way, this notion of a “basis” differs from Cameron’s (in forthcoming, §1.3): there he identifies having a similar basis with having an “internally [similar] epistemic position”.

- (4) **Change.** It won't always be the case that  $P$  is true.
- (5) (Therefore, it won't always be the case that if anyone closely believes  $P$  then  $P$ .)<sup>9</sup>
- (6) **Perpetuity.** If necessarily  $A$ , then it will always be the case that  $A$ .
- (7) Therefore, Grover doesn't know  $P$ .

Reflexivity is a structural principle about closeness: Grover's actual, present belief is close to itself. This corresponds to the general principle that safety is factive, in the sense that no false belief is safe. Permanent Belief is a peculiar consequence of Broad's kind of Growing Block picture: once an event happens it remains the same forever. In particular, then, Grover's belief will retain whatever features make for epistemic closeness even when its moment has passed. I'll say more about this in the next section. Change is another consequence of that picture, namely that the block grows: absolute presence is dynamic, not static. Perpetuity is the principle that what will happen can happen.<sup>10</sup>

## 4 Whose Problem?

Let's examine which views the safety argument makes trouble for. We'll see why presentism is not vulnerable (it isn't the reason usually given), and see how some non-presentist views can also escape. The key issue, we'll see, isn't just the temporariness of *being*, but also the temporariness of *believing*.

Consensus has it that presentists are not vulnerable to the epistemic objection. "For according to the presentist all that exists is the present, so the fact that we know we exist guarantees that we are in the present" (Braddon-Mitchell 2004, 199).

Ross Cameron points to a flaw in this reply (forthcoming, chap. 1). Knowing that we exist only puts us in a position to know we are present if we are also in a position to know that whatever exists is present. If we can know that presentism is true, this knowledge is highly theoretical, based on philosophical reflection. Then if such reflection can secure knowledge of presence for the presentist, why couldn't similar

<sup>9</sup>This inference uses an instance of the axiom K for tense logic: if it will always be the case that  $A$ , and it will always be the case that if  $A$  then  $B$ , then it will always be the case that  $B$ .

<sup>10</sup>David Kaplan's tense logic gives up this principle (1979). According to Kaplan, statements like "Obama is not actually president" *will* be true (when his presidency ends), but *couldn't* have been true (because he actually *is*). Cian Dorr and Jeremy Goodman (manuscript) criticize Kaplan's position, and I'm taking their side here. (I'm also using their label for the "Perpetuity" principle.) But if Kaplan is right and Dorr and Goodman are wrong about this question, that just implies that in order to correctly handle temporary beliefs the Safety principle should be construed to say "necessarily, always" rather than just "necessarily". This wouldn't make a big difference to the argument.

philosophical reflection secure knowledge for the non-presentist as well? So Cameron concludes that the Epistemic Objection is no worse for non-presentist theories like GB than it is for presentism.<sup>11</sup>

While it's tempting, this is the wrong reply for the presentist—nor is it any better for the non-presentist. The question of *how* we know which time is absolutely present is a red herring, and its answer may not illuminate the difference between knowledge and mere belief. (Compare: there may be nothing interestingly different between *how* one person comes to intuitively know that every number has a successor, and how another comes to intuitively believe there is a set of all sets.) Sometimes the best answer to “How do you know?” is “I just know!” This answer doesn't set you apart from the knowledge-impostor—but that only shows that “How do you know?” is the wrong question for distinguishing knowers from impostors. The Epistemic Objection is properly understood (despite the way it has sometimes been put) not as a challenge to explain *how* we can know which time is absolutely present, but rather as an argument simply that we *don't* know—and *a fortiori* that we don't know by philosophical reflection, perception, intuition, or whatever.

Moreover, this argument does not apply to the presentist, because the presentist rejects Permanent Belief. Grover believes that *t* is absolutely present. But if presentism is true, no one will ever believe this again. (Maybe someone could later be tricked into thinking *t* is identical to some later time, but a belief on the basis of such a trick wouldn't be relevantly close.) Anyone who *falsely* believes that *t* is present would have to be in a very different cognitive situation from our normal one. So the presentist need not worry that normal beliefs about which time is absolutely present are in danger.

I should clarify this reply. Cameron writes:

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<sup>11</sup>Cameron makes this argument over the course of a chapter:

It's tempting for the presentist simply to reason thus. 'I know I exist. I know that everything that exists is present. So I know that I am present.' But this won't do, it merely postpones the problem, for the puzzle now becomes: *how* can they know that everything is present? ...

And how is it that she knows that presentism is true? For the same reason we know any theory: it's justified as part of a holistic program of theory choice – it affords certain benefits, avoids certain costs, secures certain theoretical virtues, etc. etc. ... I think this is indeed the way the presentist should respond. ...

But if this is a good way for the presentist to respond to the sceptical puzzle, I think it's equally good for their A-theorist rivals to respond this way as well. After all, *all* sensible A-theories claim that this is the present time, not only presentism: so no matter what particular A-theoretic metaphysic I settle on, my overall theory of the world will tell me that I am present. ... So the moving spotlights should, I think, simply claim that the reason she knows that she is present is precisely because her best theory of time says that she is so, just as our presentist has been moved to do. (p. 7, pp. 19–20)

[T]he presentist [can't avoid] the problem simply because she doesn't believe in the existence of people thinking they're present and getting it wrong. Thinking that there are many brains in vats undergoing simulated experiences of being in a world like ours might make vivid the sceptical problem of how you know you're not such a brain in vat, but it's merely a rhetorical device. ... Similarly, the existence of non-present beings is irrelevant to whether you can know that you're present. (forthcoming, §1.2)

That's true. Indeed, suppose Grover is the very first person to contemplate absolute presence. According to GB, in that case there *isn't* anybody in a similar epistemic situation who is making a mistake about that—not yet. But there *will* be, and thus there *could* be, and thus Grover's belief is in danger. The safety objection says that GB is committed to the possibility of close cases of error; this holds even if none of the cases are actual. In contrast, the presentist has no reason to accept even the possibility of close cases of error.

It isn't just the presentist who can resist the safety argument by rejecting Permanent Belief. Meghan Sullivan is no presentist: she thinks that whatever there was, is; and whatever there is, will ever be (2012a; developing a proposal from Williamson 2002a; see also Williamson 2013). But she holds that things change their properties—and in particular, things like Grover change with respect to what they believe. When the moment passes, Grover will still be something (forevermore!) but no one will still believe *t* is absolutely present. So Sullivan too has no reason to accept Permanent Belief, and faces no epistemic danger.

Temporary ontology is only half the story. We can get a clearer view on what makes some theories vulnerable to the safety argument by unpacking a subargument for the premise Permanent Belief. Since it simplifies a few things, let's shift our focus to the Moving Spotlight (MS) rather than the Growing Block.

According to MS, ontology is permanent: whatever there was, there is, and there will always be. So MS accepts the past Barcan formula (corresponding to Barcan 1946, axiom schema 11 on p. 2).

**Permanent Being.** Always: if it was once the case that something was *F*, then (unrestrictedly speaking) there is something which was once *F*.

$$\text{Always}(\text{Was-once } \exists x Fx \rightarrow \exists x \text{ Was-once } Fx)$$

(The formalization is included to make scopes explicit.) For instance, since there used to be dinosaurs (and what there was, there still is) unrestrictedly speaking, there *is* something which used to be a dinosaur. In short: there are past dinosaurs. (I emphasize “unrestrictedly speaking”, because one often restricts attention to just those

things which are located at the absolute present time—and some accounts build this shifting domain restriction right into the tense operators. But we’re concerned with *all* of what there is, not just the temporally proximate bits, so we’d better not understand the quantifiers as implicitly restricted to any location in time.)

GB agrees with MS that everything there was is still something. But unlike MS, GB holds that there *will* be things that there aren’t. Growing Blockers believe in ontological permanence in just one direction. So while GB implies Permanent Being, it isn’t a full-fledged “permanentist” view in Sullivan’s sense. But mere past-to-future permanence is sufficient to raise the issues we’re discussing.

Sullivan accepts Permanent Being but not Permanent Belief. The gulf between the two claims is only crossed by those with further metaphysical commitments; let’s examine those further commitments now. Permanent Being implies that, since there once were dinosaurs, there are past dinosaurs (unrestrictedly speaking). But what is it to be a past dinosaur—something that was once a dinosaur? Here’s one answer: it’s to be a *dinosaur* which is *located in the past*. So past dinosaurs are *dinosaurs*. According to this view, dinosaurs are forever. If anything is an erstwhile-dinosaur, then (unrestrictedly speaking) something is a *dinosaur*. In general, let’s use this definition:

Being *F* is **temporally pure** if and only if: it is always the case that, if something was once *F*, then (unrestrictedly speaking) something is *F*.

$$\text{Always}(\exists x \text{ Was-once } Fx \rightarrow \exists x Fx)$$

Beyond Permanent Being, the key question for evaluating the Epistemic Objection is which properties a theory says are temporally pure. According to the view I’ll call the *Pure Moving Spotlight*, only very special properties fail to be temporally pure. Here’s one example of impurity: there was once *a dinosaur located at the absolute present*. But now, while there are still dinosaurs (living in the past, forevermore), the times they are located at are no longer absolutely present. According to the *Pure Moving Spotlight* theory, it’s *only* properties like this, which make reference (explicitly or implicitly) to the absolute present time, which are ever lost.<sup>12</sup> All intrinsic qualitative properties are pure, like being spatially extended, or massive, or positively charged. So are extrinsic properties like being surrounded by dinosaurs, or being the tallest dinosaur, or simply being a dinosaur.

For the view I’ll call *Pure Growing Block*, not quite so many properties are temporally pure as for *Pure MS*. Being extended, being a dinosaur, and being surrounded

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<sup>12</sup>I’m not sure how best to explicate this idea of a property “making reference” to presence. It’s a very similar difficulty to making explicit the idea of a *qualitative* property, which intuitively makes no reference (explicitly or implicitly) to particular individuals. At any rate, for present purposes we don’t need a precise explication.

by dinosaurs are still pure. But being the tallest dinosaur isn't: according to GB, there are dinosaurs which were *once* tallest of all, but since then, taller dinosaurs yet have come into being. For the Pure Growing Blocker, only “past-intrinsic” properties are pure—properties that depend only on what goes before something, not on what comes after it.

(Here's another variant answer to the question “What is a past dinosaur?” The **temporal counterpart theorist**, or “stage theorist” says that to be a past dinosaur is not to be a dinosaur located in the past, but rather it's to have a *counterpart* which is a dinosaur located in the past.<sup>13</sup> According to this view, even if being a dinosaur is a property which can be *lost*, it is still temporally pure: if anything used to be a dinosaur, *something*—its counterpart—is a dinosaur. In general, note that while all *permanent* properties, which can never be lost, are temporally pure, the converse need not hold. One wrinkle is that, for counterpart theorists, only *qualitative* properties, which do not explicitly or implicitly make reference to any particular individuals, are “temporally pure”. This key was once in the palm of Bea's hand. So, according to the counterpart theorist, this key has a past counterpart in the palm of Bea's *past counterpart's* hand; but it doesn't follow that anything is in the palm of *Bea's* hand.)

These “pure” views say that not much changes: things remain basically as they were. For our purposes the most important thing is that for views like Pure MS, being a *belief*, and being a belief with a certain *content*, and being a belief with a certain *basis*, are all properties like *being a dinosaur*, rather than like *being a dinosaur located at the present time*. (Or so I say: in the next section I'll consider an objection from Ross Cameron.) So these views endorse this principle:<sup>14</sup>

**Pure Belief.** Closely believing *P* is temporally pure.

(As in Section 3, by “closely”, I mean close to the particular case under consideration—Grover's.)

Pure GB has a little more wiggle room on this principle than Pure MS does: in some cases, whether a case of belief is close *might* depend on things that come later.

<sup>13</sup>For defenses of temporal counterpart theory, see Sider (2001) and Dorr (manuscript). But both of these views are importantly different from the GB and MS views I am discussing here: they are both broadly in the “four-dimensionalist” family views I'll discuss in Section 6—though in Dorr's case the distinction is especially vexed.

<sup>14</sup>For the counterpart variant, this may not be true when *P* is a non-qualitative proposition: having a certain *de re* belief about *x* is plausibly partly a matter of standing in a certain relation to *x*, and thus a non-qualitative property. We can easily enough still run the argument as long as there are any *qualitative* temporary propositions. (But Cian Dorr denies this: on Dorr's view, *only* non-qualitative propositions change in truth-value. So Dorr's view accepts Permanent Being, but nicely threads the needle to avoid the Epistemic Objection: for *qualitative* propositions he rejects the premise Change, and for *non-qualitative* propositions he rejects Pure Belief, and thereby the premise Permanent Belief.)

But these will be unusual cases. (For instance, I noted earlier that a belief’s “basis”, in a wide sense, might be sensitive to what the causal laws are. Furthermore, some hold that what the causal laws are depends on what the whole spatio-temporal mosaic is like. Combining this view with the Growing Block view would result in a view according to which what the causal laws are can change, as the mosaic grows, and in this way the content and basis of past beliefs can change. See Hawthorne (2004) for related discussion, though he doesn’t consider the interaction with Growing Block views. But this is a pretty exotic combination of views. Here’s another kind of case: maybe a belief can *become a de re* belief about a future person only once that person comes into being.)

Views that embrace Pure Belief—like Pure MS and Pure GB do—cross the gap from Permanent Being to Permanent Belief, which means these views are vulnerable to the Epistemic Objection. We can spell out the subargument for the premise Permanent Belief like this.<sup>15</sup>

- (8) If someone closely believes  $P$ , then it will always be the case that it was once the case that someone closely believes  $P$ .

$$\exists x Bx \rightarrow \text{Will-always Was-once } \exists x Bx$$

- (9) Always: if it was once the case that someone closely believed  $P$ , then someone once closely believed  $P$ .

$$\text{Will-always}(\text{Was-once } \exists x Bx \rightarrow \exists x \text{ Was-once } Bx)$$

- (10) Always: if someone once closely believed  $P$ , then someone closely believes  $P$ .

$$\text{Will-always}(\exists x \text{ Was-once } Bx \rightarrow \exists x Bx)$$

- (11) Therefore, if someone closely believes  $P$ , then it will always be the case that someone closely believes  $P$ .

$$\exists x Bx \rightarrow \text{Will-always } \exists x Bx$$

Premise (8) is a standard principle of tense logic, which says in general: whatever is the case, will always have been the case. (It’s an axiom of Prior’s 1967 Minimal Tense Logic **K**.) Premise (9) is an instance of Permanent Being. Premise (10) is Pure Belief. (The conclusion follows from the premises using two applications of another tense-logical principle, Axiom **K** for “it will always be the case”.)

<sup>15</sup>For the sake of prose style I say “someone” rather than “something” in what follows, but nothing turns on this.

This makes it clear that there are really two different ways a theory of time can avoid commitment to Permanent Belief, and thus escape the Epistemic Objection. The “temporaryist” way rejects Permanent Being, and in particular premise (9) of the subargument. The “impurist” way rejects Pure Belief (premise (10)). The typical presentist falls in the first category. Other views, like Sullivan’s, embrace Permanent Being and instead give up temporal purity. For Sullivan, there are erstwhile dinosaurs, but no dinosaurs; there are things that were once extended and have ceased to be such; and so on. They have become “ghostly” (as Zimmerman 2005 puts it, §5). For Sullivan, only special properties are temporally pure, like *being self-identical*, or *being something that was once, is, or ever will be a dinosaur* (or maybe *being divine* or *being a prime number*). *Believing* certainly isn’t pure. So, unlike *Pure Growing Blockers* and *Moving Spotlighters*, “ghostly” *Growing Blockers* and *Moving Spotlighters* escape the Epistemic Objection. (This vindicates Zimmerman’s 2005, §5 suggestion.)

Another example of a view that escapes the Epistemic Objection the “impurist” way is Peter Forrest’s (2004). Forrest is a *Growing Blocker*, but he holds that only those who are located at the growing edge of being are *conscious*; when their time passes, they become mere zombies. So he too can reject Pure Belief. Perhaps consciousness is required for believing anything, in which case there will be no false beliefs to endanger Grover’s. But even if zombie-Grover goes on believing *t* is present, it’s plausible that the phenomenal change of zombification makes a relevant difference to that belief’s basis—and thus the belief ceases to be close.<sup>16</sup>

Epistemic danger looms only for those who say that beliefs don’t change much when absolute presence moves on—not just in respect of *being*, but also in respect of being *beliefs* with a certain character playing a certain role a certain setting. It is hard to see why Grover’s belief would cease to be relevantly similar when the light of presence shines elsewhere, if it doesn’t change at all in its situation, its causal role, or its phenomenal character. That’s a difficult case to make.

## 5 Distant Past?

Cameron attempts to make this case on behalf of the *Pure Moving Spotlights*. (I should note that Cameron’s own view, while a *Moving Spotlight* view, is not at all

<sup>16</sup>Note the difference between this and Braddon-Mitchell’s diagnosis. He writes that on Forrest’s view our absolute presence “would become *a priori* in the manner of Descartes’ *cogito*. In so far as we know that we are conscious, we would know that our current location in space-time was in the present, since as soon as that location in space-time was past, its occupants will be *Zombies* and thus we would have no awareness” (2004, 202). This reply suffers from the same defect as the presentist’s: it would only apply if we also *knew* that Forrest’s view was true—and who would claim that? (See Cameron forthcoming, 10.)

a Pure one—he believes in lots of qualitative change in what the past is like, but he doesn’t think this change is motivated by the Epistemic Objection.) He claims:

[W]hen we are to think about close possible circumstances in which something happens, we are (often) to think of collections of world-time pairs in which that something presently happens: i.e. we consider circumstances in which the spotlight falls on the time at which the event we are considering is happening. When thinking about what happens in close possible circumstances in which Caesar crosses the Rubicon, we should think about world-time pairs in which the spotlight shines on Caesar’s crossing the Rubicon. This does not include the actual circumstances, where Caesar crosses the Rubicon two millennia before the time on which the spotlight shines. ...

So now consider the close possible circumstances in which I believe that I am present. In all of them, I *am* present, precisely because I consider only possible circumstances in which the spotlight shines on the time at which the event I am considering—my believing that it is present—happens. My belief that I am present *couldn’t* easily have been false, then: the close possible circumstances in which I believe it are ones in which the time at which I have the belief is the time on which the spotlight falls, which is exactly what *makes* my belief true in those circumstances. (forthcoming, §1.3, original emphasis)

In my terminology, Cameron’s view is that for any belief, the only cases of belief that count as close to it are those located at the absolute present time.<sup>17</sup> Necessarily, if anyone closely believes *P*, their belief is located at the absolute present time. Thus even though *believing* is temporally pure, *closely* believing is not. Closeness implicitly makes reference to the illuminated present.

But this is a strange thing to say in combination with Pure MS. Say Caesar believes that *t'* is absolutely present. Since (we are supposing) this belief is located in the absolute past, according to Cameron’s view this belief doesn’t even count as close to itself—as Cameron evidently acknowledges. Only cases of absolutely present beliefs are close to Caesar’s. Thus reflexivity of closeness doesn’t generally hold. Then ac-

<sup>17</sup>We really do want to think of cases as possible *beliefs*, rather than as worlds, or world-time pairs, as Cameron suggests, since multiple beliefs go on simultaneously in the same world. (When we are being especially ontologically careful, we can dispense with quantification over cases or circumstances altogether in favor of modalized quantification over believers, as I’ve been doing in my more official formulations.)

according to this understanding of safety, even a *false* belief like Caesar’s can count as safe from error! Something has gone wrong.<sup>18</sup>

One of the peculiarities of views like Pure GB and MS is that they involve two different ways of talking about time.<sup>19</sup> Events have temporal locations, as they precede some events and succeed others in arrangement of temporally spread-out reality. But there is also supposed to be a sense in which the block grows, or the spotlight moves—the sense in which absolute presence *changes*. If  $t$  is absolutely present, there isn’t any later time which is also absolutely present. Even so, it *will* be the case that another time is absolutely present. The way things *will* be, in this sense, isn’t just the way other locations in time *are*.

According to Pure MS, many goings-on, like Caesar’s river-crossings and beliefs, are not located at the absolute present time. In this context, when we ask *when* an event occurs, there are two things we could mean. We could be asking for its temporal location. Or we could be asking for the time  $t$  such that, whenever  $t$  was (or is, or will be) absolutely present, the event occurs. (For the presentist, or for a non-presentist like Sullivan, these two questions have the same answer.) I say “the time”, but according to Pure MS this is an improper definite description: there are *many* times  $t$  such that Caesar’s crossing of the Rubicon took place while  $t$  enjoyed absolute presence. According to Pure MS, *every* time is one at which Caesar crosses the Rubicon. (According to Pure GB, every time subsequent to the crossing is such a time.) Even now that the absolute present is well into the 21st century, Caesar crosses still.

Cameron writes,

If the moving spotlight theory is true, it’s always the case that *when* someone goes through this process, the belief formed as a result of that process is true. Merely past people falsely believe that they are present; but their belief was true *when* they formed it—so at the time they implemented the above process, it didn’t take them wrong. (forthcoming, §1.3, original emphasis).

This is ambiguous. When  $t$ —the temporal location of Grover’s belief—is absolutely present, Grover’s belief is true. That much is right. But also, according to Pure GB and MS there are many other times at which Grover will go through this process and

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<sup>18</sup>Cameron also applies this closeness proposal to counterfactuals. In that case, it violates Weak Centering, the principle that the counterfactual conditional is as strong as the material conditional: “Had it been the case that  $A$ , it would have been the case that  $B$ ”, together with  $A$ , implies  $B$ . Note, though, that we should be cautious about conflating the closeness involved in the safety condition with the closeness involved in the semantics for counterfactuals (despite the heuristic usefulness of expressions like “couldn’t easily have believed falsely” for describing safety). For discussion see Dutant (2013).

<sup>19</sup>See Sider (2001), p. 22 for discussion. I’ve kept this in the background so far, but if you look back you’ll see the distinction plays a role in the formulation of the safety argument.

form this belief—that is, other times such that, when *they* are absolutely present, the belief formation will still occur. At all of them except *t*, Grover believes falsely. So in this sense, Cameron’s claim is false.

The second sense is the one that matters for Grover’s safety. When we are canvassing for possible cases of belief, we should include in our consideration various ways that reality has been and will be.<sup>20</sup> When we consider a way that reality will be, say when time *t'* becomes absolutely present, we should take into consideration only whatever genuine beliefs there will then be. For example, at *t'* it will be the case that Grover *used* to believe that *t* is present. For the presentist, this won’t amount to a close case of belief, for the simple reason that the presentist doesn’t think that merely past beliefs are beliefs at all; when *t'* becomes present, there just won’t *be* anybody who goes on believing *t* is present. Our search is thus restricted to those beliefs which take place *at t'* in the second sense—those whose occurrence is compatible with *t'* being present. But according to Pure MS, beliefs like Grover’s will continue to be real full-fledged beliefs that happen to be *located at* past times. When *t'* is absolutely present, Grover’s belief about *t* will be one of them. A genuine case of belief shouldn’t be excluded from consideration as a close case just on the basis of its temporal location.

I tentatively offer this double-“when” diagnosis for why Cameron’s suggestion has a ring of plausibility. But I don’t expect him to concede the point: he could stick to his original claim, insisting that he really means the “when” of temporal location, and that only the specially located beliefs can be close. As I’ve said, I find it very strange to say that a mere change in relative temporal location would make a difference to whether a belief counts as having a relevantly similar basis, without it changing in any other respect—and I take Reflexivity to be an important constraint on closeness. But ultimately, recognizing relevantly close cases is a matter of good judgment, not demonstration. I’ve done my best to present the Epistemic Objection in a way that doesn’t concede too much to the overly skeptical; but this is delicate to do without then conceding too much to the overly dogmatic.

## 6 Eternalist Hazards

Consensus has it that “four-dimensionalists” are not susceptible to the Epistemic Objection.

If you are a four-dimensionalist, it is equally easy to say why we know the current moment of time is the present. For most four-dimensionalists

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<sup>20</sup>In this sense, Cameron is right that we want to consider “world-time pairs” as possible circumstances: mere modal variation *without* temporal variation will miss some relevant cases. Of course, if Perpetuity is right, then we get variation in the time for free with modal variation, because different ways things will be *are* ways things could be.

have an indexical conception of “now”. “Now” just means the moment at which it is thought or uttered. So people at any location in space-time who believe they exist in the present, will believe correctly (Braddon-Mitchell 2004, 199)

In fact, though, many four-dimensionalists (or “metaphysical eternalists”) do have a problem. Not all of them. But some are two-faced: what they take away with one hand, they give back with the other. Though they accept temporally neutral metaphysics (in a certain sense), even so they are “propositional temporalists”, who “take tense seriously”. These two-faced eternalists have *two* “conceptions of ‘now’”: one is “indexical”, and the other is “self-locating”. The indexical beliefs are safe enough, as Braddon-Mitchell says. But temporally *self-locating* beliefs are in just as much danger as beliefs about the moving spotlight—or so I will argue. The argument is straightforward: this “hybrid eternalism” endorses the premises of the safety argument, just as much as the Pure Moving Spotlight does. The difference is just that in the hybrid view’s case, the object of belief that figures in the argument is a “self-locating proposition”, rather than a proposition about the “illuminated” absolute present.<sup>21</sup>

Suppose Ford is a four-dimensionalist. Broadly speaking, Ford holds that reality is atemporal. The present time is a certain bit of the space-time manifold, and there isn’t anything genuinely special about this bit as opposed to any other. There are spacewalks and dinosaur attacks and philosophizing going on throughout lots of the manifold, not just the part we call “now”. As D.C. Williams puts it, “[T]he total of world history, is a spatio-temporal volume, of somewhat uncertain magnitude, chockablock with things and events” (1951, 451). And: “The jerk and whoosh of this moment, which are simply the real occurrence of one particular batch of events, are no different from the whoosh and being of any other patch of events up and down the eternal time-stretch” (p. 467). In particular, Ford holds that the past and future are populated: there are people located at space-time regions in the past and future of our own, with lives and loves and beliefs which are as genuine as our own.

For example, Ford believes there are dinosaurs—living, breathing, roaring dinosaurs, and not mere abstract past-dinosaurs or fossilized ex-dinosaurs. Of course, that isn’t to say Ford believes in dinosaurs whose activities occur in the twenty-first century. Rather, Ford believes that *unrestrictedly* speaking, there are dinosaurs. Using present-tense “there are” might misleadingly give the impression that a temporal restriction is intended—but it isn’t.

<sup>21</sup>The Epistemic Objection I’m pressing is related to an argument against propositional temporalism given by Gareth Evans and Mark Richard (see Sullivan (2012b) for critical discussion). Though there’s a family resemblance, that argument focuses on the dynamics of conversation, and uses rather different premises.

Another point of clarification. One view Ford might hold is that dinosaurs are stages—short-lived and infinitely many (though we don't normally bother to distinguish between the many dinosaurs that are continuous with one another in a single dinosaur-life-history). Some stages roar, some stalk, some sleep. An alternative view is that dinosaurs are long-lived “space-time worms”, which do not roar or sleep *simpliciter*, but rather bear the roaring relation to some times, and the sleeping relation to others. This “worm” view raises another complication. As I said, Ford believes in roaring dinosaurs. But that isn't to say that Ford believes there are dinosaurs that roar with respect to the 21st century (though again the present-tense language might misleadingly give that impression). Ford believes there are dinosaurs that roar with respect to past times. But to understand Ford's view it's important to recognize that she believes these roaring-with-respect-to-past-times dinosaurs are *genuine cases of roaring dinosaurs*. Their roaring has the same “whoosh and being” as any 21st century cases of roaring. There is no difference in kind between their roars and those which take place at more proximate space-time locations. To take a complete inventory of *roars* you should include not just the present roars, but the past ones as well. This is in contrast with someone like Sullivan, who holds that there are things which once were roaring dinosaurs—but these are *not* genuine cases of roaring dinosaurs. They are on a par with things which merely *could* have been roaring dinosaurs. Unrestrictedly speaking, Sullivan holds that there are no genuine dinosaurs at all.

What this disagreement over “genuineness” really amounts to in the end, I'm not sure—but it isn't idle (even though it may not be an especially pressing question for paleontology). For ethics, it matters what genuine cases of suffering and celebration there are not just what spatio-temporally proximate cases there are (or could be, contingent on our actions). More to the present point, for epistemology it matters what genuine cases of belief there are, or could be. For these purposes then, even if Ford is a “worm” theorist, we can still keep our attention on monadic properties like being a roaring dinosaur (in relation to any time) rather than a time-relation of roaring.

So much for Ford's four-dimensionalism. Now, here's a puzzle from John Perry.

[A] professor, who desires to attend the department meeting on time, and believes correctly that it begins at noon, sits motionless in his office at that time. Suddenly he begins to move. What explains his action? A change in belief. He believed all along that the department meeting starts at noon; he came to believe, as he would have put it, that it starts *now* (1979, 4).

It sounds like there are two different beliefs in this story: the belief that the meeting starts at noon, held all along, and the belief that (as the professor would have put it) the meeting starts *now*, held just at noon. So, we might conclude (though in fact Perry

doesn't) that these are beliefs with two different objects. The object of the belief about noon is "tenseless" or "eternal"; the object of the belief about the *present* is "tensed" or "temporary".

Prior (1959) argued along these lines for temporalist metaphysics (the "A-theory"): in order to explain our different attitudes toward events in time, we should think that certain facts about the world genuinely change, such as which time is present, and what things there are, and which meetings are going on. But there are many others ("B-theorists") who reject this temporalist picture of reality, while embracing a parallel lesson about propositional attitudes. They say: though in some sense the objective facts about the world are unchanging, even so we can make sense of the difference between two *objects of belief* in Perry's case. Beliefs are not, in general, about the way the world is objectively speaking, but also about the way a certain time is—or more generally, the way a certain perspective on the world is. Rather than what we might call "objective propositions" about the way the world is, these beliefs have "centered propositions" as their objects.<sup>22</sup> These centered propositions are not supposed to be a threat to the general four-dimensional picture, because they are "constructed from purely B-theoretic notions" (Sider 2001, 21).

Here's a simple (and standard) version of this proposal: the object of a belief is a *property of times*.<sup>23</sup> Perry's professor begins by disbelieving, and then comes to believe, the property *being the time at which the meeting starts*. Noon has this property; 11 am doesn't. There are also more trivial properties of times: for instance, throughout the story Perry's professor believes the property *being a time such that the meeting starts at noon*. This property applies to every time. Such "boring" time-properties let us assimilate eternal objects of belief as a special case of "centered", temporary objects of belief.

For ease of exposition, let's suppose Ford holds that these "centered propositions" are expressed by ordinary sentences—so Perry's professor really would be able to express his temporary object belief with the sentence "The meeting starts now" (as Perry says). (For views that say the semantic values of sentences come apart from the objects of beliefs, we would have to reformulate what follows in jargon suitable for describ-

<sup>22</sup>This picture is endorsed by Lewis (1979); Kaplan (1979); Sider (2001), ch. 1; Sider (2011), ch. 10. Brogaard (2012) does not commit to metaphysical eternalism (as far as I can find) but does argue that "the commitments of metaphysical eternalism can be properly articulated only in the language of the temporalist" (p. 7, see sec. 7.5). Zimmerman (2005) discusses the difficulty of distinguishing this hybrid view from the Moving Spotlight view. My argument draws another moral from this difficulty: Since the views are hard to tell apart, the *objections* to MS are objections to the hybrid view as well.

<sup>23</sup>It's an important part of this picture that times are something like locations in space-time. They are things at which some people, things, and events are *located*, and others are not. Cian Dorr (manuscript) defends a very different view. Like the views I am discussing, Dorr's combines metaphysical eternalism with propositional temporalism. But for him, the *times* at which propositions can be true or false are nothing like space-time locations. (As it turns out, Dorr's "times" are certain functions which permute the total contents of space-time.) See also footnote 14.

ing such objects of belief.) Let's give a quick overview of how this goes—**centered semantics**.

Ford already has a “tenseless” description of the spatio-temporal—by her lights, this is a complete description. According to the centered semantics, any sentence in the language of that “tenseless” description—such as “There are dinosaurs”—expresses a boring time property: in this case, the property *being a time such that there are dinosaurs*. There are also other sentences—like “The meeting starts now”—which express non-trivial time-properties.

There's an obvious way of extending the interpretation to sentences formed using truth-functional connectives: for instance, if  $s_1$  expresses  $P$  and  $s_2$  expresses  $Q$ , then  $\lceil s_1 \text{ and } s_2 \rceil$  expresses the property that applies to just those times which  $P$  and  $Q$  both apply to. Analogous principles apply to negation and material implication.

Ford can also make sense of the usual tense operators deployed by temporalists—like the presentist, growing blocker, or moving spotlihter. If the sentence  $s$  expresses the time-property  $P$ , then  $\lceil \text{Always } s \rceil$  expresses the (boring) property that applies to each time iff  $P$  applies to every time. Similarly,  $\lceil \text{It will always be the case that } s \rceil$  expresses the (generally non-trivial) property that applies to those times  $t$  such that  $P$  applies to every time later than  $t$ . And  $\lceil \text{It was once the case that } s \rceil$  expresses the property that applies those times  $t$  such that  $P$  applies to some time earlier than  $t$ . Ford also has a deflationary use of “true” for time-properties: if “ $P$ ” refers to the time-property  $P$ , then “ $P$  is true” just expresses  $P$ .

Say two sentences are **equivalent** (according to the centered semantics) iff they express properties that necessarily apply to just the same times. Say Ford **accepts** a sentence when (according to this account of the objects of belief) she believes the time-property it expresses. Ford is a propositional temporalist, in the sense that she accepts

**Temporalism.** For some  $P$ ,  $P$  is true, but it's not always the case that  $P$  is true.

For indeed, the property this expresses on the centered semantics clearly applies to every time. (It's the property of being a time  $t$  such that some property applies to  $t$ , but not to every time.)

Ford can also make sense of believing that a certain time  $t_0$  is *present*—not merely that  $t_0$  is identical to a certain date in 2014, or that  $t_0$  is the time of a certain thought or utterance, but that it is present *simpliciter*. The time-property expressed by “ $t_0$  is present” is just the property *being identical to  $t_0$* . There is another equivalent way of describing this time-property, using Leibniz's Law: a time  $t$  is identical to  $t_0$  iff for every time-property  $P$ ,  $P$  applies to  $t$  iff  $P$  applies to  $t_0$ . So another way of putting it is that “ $t_0$  is present” is equivalent to

**Accuracy.** For all  $P$ ,  $P$  is true iff  $P$  applies to  $t_0$

Now let's see why these commitments lead to epistemic danger. As a warm-up, let's see why (like Pure GB and Pure MS) Ford holds that the past is full of cases of error. Then we'll see why (as for Pure GB and Pure MS) these past errors really do indicate present danger of error.

Ford holds that past people have beliefs which are just as genuine as those of present people. This includes centered beliefs. So there is Caesar in the past, crossing the Rubicon, and believing that a certain time  $t_0$  in 49BC is *present* (though of course not under that description, since Caesar didn't use the Gregorian calendar). That is, according to Ford, Caesar has a centered belief the object of which is the property expressed by " $t_0$  is present", the property that applies to  $t_0$  and nothing else. Call this property  $P$ . Ford believes that Caesar believes  $P$ . Ford is philosophizing in 2014, not at  $t_0$  (which was in 49BC), and Ford knows this perfectly well. So in contrast to Caesar, Ford accepts "It is not the case that  $t_0$  is present" (which expresses the property applies to every time but  $t_0$ ). So Ford accepts "Caesar believes  $P$ , and  $P$  is not true". In short, according to Ford, Caesar believes something that isn't true. And Caesar is hardly unique in this respect: *every* belief in a time-property that does not apply to Ford's time is, according to Ford, a false belief. So the past and future are strewn with error.

(Don't be distracted by the fact that Ford *also* accepts "It once was the case that what Caesar believed was true"—since  $P$  applies to  $t_0$ . The Moving Spotlighter says this, too. But Caesar's belief having once been true doesn't prevent it from being a false belief for the rest of time.)

I should emphasize that all of this turns on the peculiar self-locating account of " $t_0$  is present", the object of Caesar's belief. In contrast, understanding the word "present" as an indexical, Caesar does not, nor did he ever, believe that  $t_0$  is present—no more than he believed that I am Caesar, or that the Rubicon is here. Rather, he believed other things—eternal truths—which he could have expressed with Latin translations of the sentences "I am Caesar", "The Rubicon is here", and " $t_0$  is present". It is beliefs involving the self-locating "present", not the indexical "present", which fall into error.

As for Pure GB and MS, this manifold error indicates that Ford's *own* beliefs, and those of her contemporaries, are also in danger of error. Consider Grover again. Now Grover is contemplating not the edge of being, but simply the "centered proposition" expressed by " $t$  is present". (Note that any other temporary "proposition" will work just as well for the argument.) Ford has as much reason as the Pure Moving Spotlighter to accept each of the premises that show that Grover's belief is not knowledge (even when it is true), when these premises are understood as expressing "centered propositions". The reasons for three of those premises carry over directly without change,

and I won't discuss them further: Safety, Reflexivity, and Perpetuity.<sup>24</sup> These are the remaining two premises:

**Change.** It won't always be the case that  $P$  is true.

**Permanent Belief.** If someone closely believes  $P$ , then it will always be the case that someone closely believes  $P$ .

Change is straightforward enough. Ford believes that there are times later than  $t$  that  $P$  does not apply to. So, applying the centered semantics for tense operators, Ford believes the time-property expressed by "It won't always be the case that  $P$  is true". That is, Ford accepts the premise Change. This follows from her temporalist commitments.

As for Permanent Belief: who believes what on which basis is a fact about the pattern of events in the manifold—it isn't "perspectival". What close cases of belief there are shows up as part of Ford's "tenseless" description of reality (just as what cases of dinosaur-roaring there are does). That means the time-property expressed by "Someone closely believes  $P$ ", according to the centered semantics, is a boring property that applies to every time if it applies to any. Thus, if the this boring property fails to apply to a time, so does the (also boring) property expressed by "It was once the case that someone closely believes  $P$ ".<sup>25</sup> So the property expressed by Permanent Belief applies to every time, and thus (since Ford recognizes this) Ford accepts Permanent Belief.

We can also see this by considering the premises of the subargument for Permanent Belief from Section 4:

<sup>24</sup>I should note that Perpetuity—the premise that what is necessarily the case is always the case—is one place where someone might try to find a disanalogy between Ford and MS. But I don't see it. The defense Dorr and Goodman give (manuscript) doesn't turn (as far as I can tell) on whether "tense is fundamental" or such metaphysical claims that might separate the two views. And if it turns out that Perpetuity is false, then in either case we should reformulate Safety. The principle is usually stated by quantifying over "cases of belief" in an ontologically promiscuous way, which I have attempted to clean up with a modal gloss. But if it happens that there *will* be cases of belief which (nonetheless) there *couldn't* be, then this purely modal gloss is inadequate: we should state Safety with the explicitly tensed operator "necessarily, always" rather than simple "necessarily".

A few people suggested to me that the defender of self-locating belief should give up the Safety premise, which concerns *true* belief. Instead, they should hold that epistemic safety merely rules out the possibility of close *incorrect* belief, where a false belief can nonetheless be correct, if its content *was* true when the temporal location of the belief was present. I can see why someone might be tempted to go that way—but why is this amendment in better standing in this case than it would be for the Pure Moving Spotlighter? The point I am making is that the eternalist-temporalist hybrid is in *as much* trouble as that view—not more. Furthermore, this amendment has (like Cameron's proposal considered in Section 5) the unattractive consequence that a belief can be both safe and false.

<sup>25</sup>Or anyway, mostly boring: if there is a very first moment of time, this property doesn't apply to it.

**Permanent Being.** If it once was the case that something was  $F$ , then (unrestrictedly speaking) something once was  $F$ .

**Pure Belief.** Closely believing  $P$  is temporally pure.

Both of these follow from Ford’s eternalist commitments. Ford holds that what there is, and what things are like in all “uncentered” respects, is not subject to change. Ford is (like the Moving Spotlights) an ontological eternalist: what there is, is part of the “tenseless” description of reality, and not subject to change. So Ford accepts Permanent Being.<sup>26</sup> Furthermore, “closely believes  $P$ ” is a monadic predicate in Ford’s “tenseless” description of reality. (If it weren’t “tenseless”, then centered beliefs would fail to be “constructed from purely B-theoretic notions” as Sider put it, in line with the aims of this project.) Any such predicate  $F$  is temporally pure: for there to have once been an  $F$  requires that there be an  $F$  (unrestrictedly speaking).<sup>27</sup>

The overall conclusion of this section is that *if* the Epistemic Objection shows that the Pure Moving Spotlight view is wrong, then it also shows that Ford’s eternalist-temporalist hybrid is wrong in the same way. In the previous sections I argued for the antecedent of this conditional. So we should reject the hybrid.

As it happens, we already had reason to suspect that Ford’s hybrid eternalism was an awkward combination of views. Ofra Magidor (forthcoming) convincingly argues that puzzles like Perry’s do not really motivate anything like “centered propositions”.

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<sup>26</sup>The full story behind the centered semantics for the Barcan Formula is a little complicated when we take into account temporally non-trivial predicates. In general, a predicate  $F$  expresses a *relation* between individuals and times. If  $F$  expresses  $R$ , then “Something is  $F$ ” expresses the property

$$\lambda t (\text{something bears } R \text{ to } t)$$

And the complex predicate “was once  $F$ ” expresses the relation

$$\lambda(x, t) (x \text{ bears } R \text{ to some time before } t)$$

Then “It was once the case that something was  $F$ ” and “Something was once  $F$ ” both alike express the property

$$\lambda t (\text{something bears } R \text{ to some time before } t)$$

(In the counterpart interpretation, things are a bit more complicated yet, but the basic upshot isn’t affected.)

<sup>27</sup>Again, the details use the general correspondence between predicates and relations to times. If  $F$  is a “tenseless” monadic property, then it expresses a *temporally boring relation*, which things bear to every time or none. (For the counterpart theorist, “boringness” also depends on  $F$  being *qualitative*, rather than relational. This might require us to choose a target centered belief, that isn’t about a particular time.) If “Something was once  $F$ ” applies to  $t$ , this means there is something that bears  $R$  to a time before  $t$ ; and since  $R$  is boring, this implies that something bears  $R$  to *every* time. So “Something is  $F$ ” also applies to  $t$ . That is just what temporal purity requires.

Perry’s puzzle is an instance of Frege’s puzzle: the relation between “the meeting starts now” and “the meeting starts at noon” is exactly analogous to the relation between “Hesperus is bright” and “Phosphorus is bright”. “Centered propositions” don’t help us make sense of cases where (as we might say) someone believes Hesperus is bright without believing Phosphorus is bright. Instead of anything like time-properties, we ought to approach Perry’s puzzle with some more general-purpose machinery that handles both kinds of case equally well—like Fregean senses, or beliefs “relative to a guise”. The four-dimensionalist, thus equipped, has no need of objects of belief that change truth-value.

The argument I’ve given here shows that the hybrid isn’t just unmotivated, but also epistemically hazardous. Centered propositions, even if they can be objects of true belief, are not objects of knowledge. Thus they are unfit to play the role they were introduced for: it isn’t just that Perry’s professor *believes* that the meeting is starting, but that he *knows* it, which figures in a full explanation of his successful actions.<sup>28</sup>

One last observation. Perhaps the reason that the hybrid view is vulnerable to the Epistemic Objection in the same way as the Pure Moving Spotlight view is that the hybrid view (despite certain metaphysical protestations of its defenders) just *is* the Pure Moving Spotlight view. It certainly is difficult to find points of disagreement between the two views.<sup>29</sup> Some (like Sider 2011, chap. 10) look for differences about whether the ideology of one perspective or the other is *fundamental*. (Similarly Zimmerman 2005, §§5–6 appeals to differences about which properties are *primitive*, or genuinely *monadic*.) These notions may illuminate an interesting metaphysical debate. Even so, differences about fundamentality or primitiveness don’t seem like they would make a difference to close-to-home (and surely far from utterly fundamental) questions about what we can know. When it comes to this question, differences concerning these “meta-metaphysical” devices that we might find between spotlights and eternalist temporalists are idle.

<sup>28</sup>That is, these “centered propositions” aren’t fit to serve as objects of our ordinary temporal beliefs. But this still might leave a different job for them to play: as the objects of *metaphysical* beliefs held by people with mistaken views of the nature of time. These objects of belief would be “factually defective”, in a sense—not representing any genuine temporary features of the world, and not being *determinately* true or false.

<sup>29</sup>See Zimmerman (2005) for discussion. Zimmerman is worried that it’s a fault of the Moving Spotlight view if it can’t be distinguished from the eternalist hybrid—but it seems to me the shoe is on the other foot. This point is directly analogous to the difficulty faced by relativists of various stripes—for instance, about predicates of taste or value—to distinguish themselves from flat-footed “chauvinist” *realists* about taste or value. See Cappelen and Hawthorne (2009), p. 137.

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