

# **A Believable A-Theory**

Alexander Jackson

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*Abstract:* The A-theory of time is plagued by certain standard armchair problems: the presentism–eternalism dilemma, the problem of truth-makers, the problem of temporary intrinsics, and the alleged impossibility of cross-temporal relations. These challenges supposedly force A-theories to make incredible claims. I argue that these challenges are not deep antinomies in common sense, but rest on avoidable mistakes. I present a new A-theory that shows what’s possible once we move past the old problems. On this proposal, time’s passing is a metaphysically fundamental aspect of reality. I take this to mean that there are fundamental facts like: four hours passed from 8am today until noon. This A-theory also posits fundamental facts about the state of the universe at a time, and about cross-temporal relationships. The proposed metaphysical package attractively articulates our common sense, pre-relativistic conception of time.

*Keywords:* A-theories of time, passage of time, presentism, metaontology, truthmakers, temporary intrinsics.

## **1. Introduction**

The A-theories of time we find in the literature make me grumpy. I want an A-theory to articulate our common-sense, pre-relativistic view of time (we can worry about contemporary physics once we’ve got that far). But that’s not what we get. The A-theories we are presented with

are startling. *It is impossible for anything to come into or go out of existence*, some assert.<sup>1</sup> *There are no truths concerning things that have ceased to exist*, say others.<sup>2</sup> *Facts apparently about the past are really facts about the way things are now*, we hear.<sup>3</sup> And so on. These claims do not articulate our intuitive understanding of time. Quite the opposite—they conflict wildly with common sense. As we’ll see, armchair metaphysical arguments supposedly force A-theories to adopt incredible views. Those arguments do not strike me as providing extraordinary evidence for extraordinary conclusions. They do not uncover deep antinomies in common sense, but rest on avoidable mistakes. (By contrast, Special and General Relativity may provide the right sort of evidence to revise common-sense thinking about time.)

I will present a common-sensical A-theory, and rebut four orthodox arguments that supposedly rule it out. My proposed A-theory posits three types of metaphysically fundamental fact. Here are the past-tensed schemata; you can fill in present- and future-tensed analogues.

(State facts) At time  $t$ , object  $o$  was F (and certain relations held).

(Passage facts) Amount of time T passed from time  $t_1$  until time  $t_2$ .

(Cross-temporal relationships) Objects  $o_1, \dots, o_n$  were R-ly related.

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<sup>1</sup> Williamson (2013, chapter 1), Sullivan (2012b), Deasy (2015, 2017), Cameron (2015)—see §4.

<sup>2</sup> Prior (1967 chapter VIII, 1968, 1998), Bigelow (1996), Zimmerman (1998, 2007), and Markosian (2004)—see §4.

<sup>3</sup> Bigelow (1996), Crisp (2007), Cameron (2015)—see §5.

For example, suppose that Phoebe was a photon, Peter and Penelope were elementary particles, *ss* were some points of spacetime along which an isolated asteroid travelled earlier today, and it is now afternoon.

(State example 1) At 8am, Phoebe was emitted.

(State example 2) At 8am, Peter and Penelope were 1 meter apart.

(Passage example) 4 hours passed from 8am until noon.

(Cross-temporal relationship example) *ss* formed an unaccelerated connected path.

All three schemata are tensed, reflecting the metaphysical difference between past, present and future. As I'll explain in §2, this makes the proposal an A-theory. I'll motivate fundamental passage facts in §3 and cross-temporal relationships in §7. I will compare my proposal to a standard A-theory of the kind proposed by Arthur Prior, but I won't argue exhaustively that my A-theory is preferable to every alternative in the literature.

My proposal provokes four orthodox objections. First, this looks like an 'eternalist' A-theory, rather than a 'presentist' one; surely that make the proposal implausible. Second, A-theorists must posit present truth-makers for all truths. That is, the fundamental facts all concern how things *are* (now), and so are perspicuously represented using the present tense. My past-tensed schemata violate this requirement. Third, the so-called 'problem of temporary intrinsics' shows that my state facts are not fundamental. Fourth, A-theories must repudiate fundamental cross-temporal relations. I will explain these complaints in §§4–7 respectively, and argue that they have no force. These sections are central to the paper. I am fond of my positive proposal—it shows that A-theories can be common-sensical, and illustrates the points I make—but my main concern is to end four mistakes that have made mischief for decades.

Here's the plan. Section 2 explains why my proposal counts as an A-theory, and explains some ways in which it differs from a Prior-style A-theory. Section 3 motivates my account of time's passing, as a matter of fundamental passage facts. Sections 4–7 work through the four orthodox challenges mentioned above, explaining away their force.

## **2. What is an A-theory?**

A-theories of time hold that past, present and future differ in metaphysical status. The present is in some sense 'more real' than the past and future, according to natural A-theories. B-theories hold that past, present and future have the same metaphysical status. This metaphysical disagreement manifests in how one thinks it is metaphysically perspicuous to represent reality. A-theorists use tenses when talking about past, present and future, reflecting their differing metaphysical status. B-theorists hold there is no such difference in status, and so use tenseless verbs when attempting to represent things metaphysically perspicuously. For example, B-theories might describe fundamental states of the world in the following sort of way: at 8am on day D, Phoebe *is\** emitted (where 'is\*' is a tenseless form of the verb 'to be').<sup>4</sup> An A-theory might instead say: at 8am on day D, Phoebe *was* emitted. The past tense reflects that day D is, in a metaphysically significant sense, gone.

The A-theory and the B-theory should be taken as claims about the metaphysically fundamental facts. A-theorists can admit that some non-fundamental facts about other times are perspicuously represented tenselessly, as long as they are metaphysically explained by fundamental facts perspicuously represented using tenses. For example, A-theorists can admit that at 8am on day D, Phoebe *is\** emitted, as long as that's true because at 8am on day D,

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<sup>4</sup> Typical B-theorists include Smart (1998), Mellor (1998, chapter 1), and Sider (2001, chapter 2).

Phoebe *was* emitted. So the dispute must be about the fundamental facts: A-theories use tenses to state the fundamental temporal facts, while B-theories do so tenselessly. That’s my official characterization of the two camps.<sup>5</sup> Twenty-first century metaphysics holds that many traditional disputes really concern which facts are fundamental;<sup>6</sup> it is unsurprising that we should understand the A-theory–B-theory dispute in this way too. However, we’ll need to check the standard assumptions of the twentieth-century debate once we reorient to what’s fundamental; some do not carry over.

My A-theory uses tenses to characterize three kinds of fundamental facts. Section 1 gave the past-tensed schemata: how things *were* at a given time, how much time *passed* between two times, and how some things *were* cross-temporally related. The use of past, present, and future tenses represents the metaphysical difference between past, present and future. This makes the

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<sup>5</sup> Tim Maudlin (2018; also 2007: 108–9) complains that he does not understand the A-theory–B-theory dispute. He assumes that “a ‘tenseless is’ ... amounts to saying ‘is, was or will be’.” (2018: 1808.) He concludes that A-theories and B-theories say the same things, just in different words, and so do not disagree. Maudlin’s premise is mistaken: when stating how things are fundamentally, a tenseless ‘is\*’ does not amount to ‘is, was or will be’. Firstly: “o was, is, or will be F” is disjunctive, so no-one should take it to be fundamental, whereas B-theorists take “o is\* F” to state a fundamental fact. Secondly: “o was, is, or will be F” uses tenses, and so B-theorists should deny that it perspicuously represents the temporal facts, unlike “o is\* F”. In general, inter-definable expressions are not equally good for stating the fundamental facts. Not-not-*p* is logically equivalent to *p*, but arguably the former cannot be fundamental. Grue/bleen talk is inter-definable with green/blue talk, but the former is not fundamental even if the latter is (Sider 2011: 1–8).

<sup>6</sup> Metaphysics is approached through the lens of fundamentality by Fine (2001, 2005, 2009, 2012), Schaffer (2009, 2016), Cameron (2010), Rosen (2010), Sider (2011, 2020), Williams (2012), Bennett (2017), and deRosset (2023). I will ascribe fundamentality primarily to facts (and pluralities thereof) rather than individuals. Officially, we avoid reifying facts by writing: ‘fundamentally, *p*’. Author (article1) defends my preferred conception of fundamentality and metaphysical explanation.

proposal an A-theory. B-theories don't use tenses to characterize the fundamental facts, because they deny that tenses mark real metaphysical differences.

This A-theory does not posit a fundamental property of presentness, had by a time. It is a non-fundamental fact that a certain time is present. The present-tensed state facts all concern how things are at the same instant (e.g. 5pm). That metaphysically explains why that time has the property of presentness. On this view, the special status of the present moment is fundamentally something reflected by the present tense; the property of presentness is derivative. It doesn't make sense to ascribe presentness without using the present tense, and the present tense renders a fundamental property of presentness otiose.<sup>7</sup>

My proposal treats times—temporal locations—as fundamental entities. There's more to say about the nature of times, but this isn't the place.

This paper does not survey rival A-theories, but I will discuss a standard view associated with Arthur Prior.<sup>8</sup> This kind of A-theory uses tense sentence operators to state the fundamental temporal facts. There are two kinds of tense sentence operators. First: *simple* tense sentence operators include WAS(*p*), WILL(*p*), and maybe some others. 'WAS(Phoebe is emitted)' translates as saying Phoebe was emitted at some past time or other, though this approach does not itself talk about times. The basic sentences to which tense operators apply are present tensed and have no 'at *t*' clause. 'WAS(*p*)' is a sentence operator: it operates on any sentence to make another sentence. Sentence operators iterate; for example, 'WAS(WAS(WAS(Phoebe is emitted)))' is a

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<sup>7</sup> Some 'moving spotlight' views posit a fundamental property of presentness, such as those formulated (not endorsed) by Fine (2005: 286–7), Sider (2011: 259–262), and Skow (2015: 44–6). Other views labelled 'moving spotlight' do not, such as Deasy (2015) and Cameron (2015).

<sup>8</sup> The *locus classicus* is the work of Arthur Prior (1967, 1968, 1991). Sider (2001: 11–17) summarizes the orthodoxy; also Sider (2011: 239–242).

sentence. Second: *metric* tense operators formalize the claim that Phoebe was emitted *four hours ago*, as follows:  $WAS_M(4 \text{ hours}, \text{Phoebe is emitted})$ .<sup>9</sup>

I will focus on the Prior-style view that the fundamental temporal facts are to be stated using only metric tense operators. Using only simple tense operators does not yield a rich enough collection of fundamental temporal facts.<sup>10</sup> Even if simple tense operators could describe the full ordering of states of the universe (which I doubt<sup>11</sup>), they wouldn't capture the temporal metric. I can move my arm through the same arc twice, cycling through the same sequence of states, but that doesn't mean the gestures took the same amounts of time. We should not do without facts about how long things took (or at least comparisons like 'the same duration' or 'twice as long'). Given fundamental facts stated using metric operators, we should not add further fundamental facts stated using simple tense operators: they would be objectionably redundant.

My proposal differs from the Prior-style view that the fundamental temporal facts are to be stated using metric tense operators. For one thing, my A-theory refers to past times, to say how things were then. Prior-style A-theories do not refer to past times—that's a key argument for using metric tense operators. I'll rebut this motivation for preferring a Prior-style view in §4.

Another difference: my three schemata do not use any sentence operators. Sentence operators iterate. For example, it may be true (and allegedly fundamental) that:  $WAS_M(2 \text{ hours}, WAS_M(2 \text{ hours}, \text{Phoebe is emitted}))$ . My view uses no iterating operator. 'At time  $t$ , ...' cannot be applied repeatedly: 'At 10am, at 8am, Phoebe was emitted' is nonsense. Moreover, 'At time  $t$ , ...'

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<sup>9</sup> Prior investigates metric tense operators sympathetically (Prior 1967 chapter VI; 1968: 8–11); also Creswell (2013).

<sup>10</sup> Compare Sider (2011: 240 n.4).

<sup>11</sup> I don't see how simple tense operators could fully describe a 'dense' ordering of states of the universe (where between any two times there is a third).

is not a *sentence* operator, because it never operates on a sentence. On my view, ‘Phoebe was emitted’ is not a complete sentence of the language for stating fundamental facts. (Nor is ‘Phoebe *is* emitted’: the relevant fact concerns how things are *at a certain time*—see §6.) More differences between my proposal and the tense operator view will emerge (§§3, 4, 6, 7).

My proposal specifies the ‘metaphysical form’ of three kinds of fundamental fact: the schemata specify what certain fundamental facts have in common at the right level of abstraction to illuminate the metaphysics of time. Some philosophers assume that the metaphysical form of the fundamental facts must be their logical form as given by a standard logical system. That is, the fundamental facts are best represented by sentences of quantificational logic, possibly adding logical apparatus such as sentence operators. Call this view ‘Logical Fundamentalism’. It is explicitly endorsed by Sider (2001: xvi–xxiv; 2011: chapters 9–11 esp. pp. 182–8), Sullivan (2012b: 150), and Deasy (2017: 380–1). Prior’s tense operator language is a paradigmatic extension of quantificational logic. By contrast, the three schemata I gave are not acceptable to Logical Fundamentalists: the ‘at *t*’s and past tenses would need to be analyzed.

That is no reason to prefer the Prior-style view. My three kinds of fundamental fact are common-sensical, and there is no good argument for Logical Fundamentalism. In particular, Sider’s argument fails (2011: 188; 2020: 42). Sider observes that our best theories about fundamental physics are framed in a language of first-order logic. The relevant truths of physics are fundamental, he claims, and so Logical Fundamentalism is true. I reply that the relevant truths of physics are not metaphysically fundamental. Let’s consider two examples. First, my fundamental state facts can explain the truth of claims put in tenseless first-order logic. For example, “Phoebe bears the emitted-at relation to 8am” (formalized ‘ $E_{pt}$ ’) is true because: at 8am, Phoebe was emitted. Second, Sider emphasizes that our best scientific theories include quantificational truths, best framed in first-order logic. But as I will explain in §4, quantificational



truths are not metaphysically fundamental. In sum, Sider's argument for Logical Fundamentalism assumes that certain truths of physics are metaphysically fundamental, but they are not (I argue). In the absence of an argument otherwise, my proposal looks in good order.

### **3. What is it for time to pass?**

A-theories must hold that time passes: what *is*—what has the special metaphysical status of the present—must change, and that should be the result of time passing. A-theories need an attractive characterization of passage. But what is it for time to pass? It is a platitude that time passes, yet it can seem philosophically mysterious.

It helps to see that 'time passes' is a general claim, like 'rain falls from clouds'. 'Time passes' is to be understood in terms of its instances: time passes because particular periods of time pass. What it is for time to pass is for specific amounts of time to pass between pairs of times. I propose the following metaphysically perspicuous way of talking about passage: amount of time  $T$  passes from time  $t_1$  until time  $t_2$ . For example: four hours passed from 8am today until noon. Together with the facts that I breakfasted at 8am and luncheoned at noon, this explains why four hours passed from my breakfasting until my luncheoning. The proposed facts are familiar: office workers everywhere agree that 8 hours passed from 9am to 5pm last Tuesday. It is a substantive, non-trivial fact that four hours passed from 8am today until noon. Any appearance to the contrary is the result of the special names I used for the two times. If while breakfasting I introduced the name 'Tabitha' for the present moment, and 'Tommy' likewise while luncheoning, I could state that four hours passed from Tabitha until Tommy, with no appearance of saying something trivially true. I will continue to use labels for times like '8am today', using a familiar coordinate system; set aside whether that's maximally metaphysically perspicuous.

Plausibly, an A-theory will treat time's passing as a metaphysically fundamental aspect of reality. Our analysis of time's passing suggests the following sharpened proposal. According to my A-theory, facts of the following form are metaphysically fundamental: amount of time  $T$  passed from time  $t_1$  until time  $t_2$ .<sup>12</sup> A-theorists will tense the verb 'to pass', saying for example: 4 hours *passed* from 8am on day D until noon on day D. Past periods of time are gone, and our A-theory will use the past tense to reflect that.

If a period lies wholly in the past, then it passed; and if it lies wholly in the future, then it will pass. But what if a period of time contains the present moment? Then that period is passing, I'm inclined to say. For example, 100 years are passing from the year 2000 until the year 2100. That present progressive tense indicates an on-going process. It is distinct from the stative present tense used to describe the way things are at the present moment. This way of talking about currently passing periods takes very seriously the dynamic nature of reality, which is a virtue in an A-theory.

The proposal is that the facts about passage are fundamental; they do not hold in virtue of any other facts, and they do not 'consist in' anything else. Complaining that the proposal does not explain what time's passing 'consists in' simply begs the question. Surely we should take seriously the possibility that an A-theory treats time's passing as a fundamental phenomenon. A-theories need an attractive characterization of passage, and the last few paragraphs arrived at an utterly natural view. To my knowledge, no A-theorist has defended this view of passage before.

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<sup>12</sup> The proposal takes as fundamental *all* the facts about the passing of specific amounts of time, any restriction being unpalatable. Given that all these facts are fundamental, I don't see any advantage to postulating a metaphysical grounding structure between some of them. Here I agree with Sider (2011: 134), contra Fine (2001: 27 n. 38) and Rubenstein (2024 §5.2). Still, there may be other senses in which the passing of shorter intervals "explains" the passing of longer intervals they cover.

The Prior-style metric tense operator A-theory contradicts my proposal about which facts are fundamental. (I will use square brackets simply to indicate scope, not as a term-forming operator.) My view says that there are fundamental facts like: [4 hours passed from 8am today until noon] and [At 8am, Peter and Penelope were 1m apart]; the tense operator view denies this. The tense operator view says that there are fundamental facts like:  $WAS_M$ [4 hours, Peter and Penelope are 1m apart]; my proposal denies this. My proposal treats  $WAS_M$ [4 hours,  $p$ ] as a non-fundamental kind of truth; I suggest the following account. It is true that [4 hours ago,  $p$ ] because: [at 8am,  $p$ ], [4 hours passed from 8am until noon], and the present-tensed state facts say how things are at noon. The last conjunct captures its now being noon. So on my view, the passing of the last 4 hours is a precondition for things having been some way *4 hours ago*, but not for things having been that way *at 8am*. By contrast, the tense operator view holds that the passing of those 4 hours is not a separable precondition for things having been some way 4 hours ago.

My proposal separates fundamental facts about past states and about the passing of time, whereas the tense operator view blends these phenomena together. This is a significant metaphysical disagreement, and my proposal seems preferable. Intuitively, what happened at 8am is independent of what happened later, including the subsequent passing of four hours. My proposal endorses this intuition: there are fundamental facts about the way things were at 8am, distinct from the subsequent passage of time. By contrast, the metric tense operator view denies the intuition. On that view, how things were at 8am is fundamentally blended with the subsequent passing of 4 hours.

#### **4. The presentism–eternalism dilemma**

On to the first of the four orthodox complaints about my proposal. One might object that the best A-theory must endorse ‘presentism’, which holds we should ‘ontologically commit’ ourselves only to presently existing things, and thus forbids unanalyzed talk of past and future times and objects.<sup>13</sup> I admit that my proposed A-theory is incompatible with presentism. To state the fundamental state facts, we talk about objects that don’t exist now, and past and future times, to say how those objects were or will be at those times. For example, suppose Phoebe the photon was emitted at 8am; that can be a fundamental fact even if intuitively, Phoebe no longer exists. Many facts about passage and cross-temporal relations also concern past times and objects that no longer exist. Allegedly, positing such facts about past individuals and times commits my proposal to ‘eternalism’, the view that past and future things exist, such as 8am and Phoebe, and the future time 10pm and Philip (a photon that intuitively only comes into existence then). But common-sense A-theories hold that the past is metaphysically gone, and so should hold that Phoebe no longer exists (and similarly, Philip is yet to exist). So my proposal does not capture the common-sense heart of the A-theory, one may allege.

Presentism and eternalism present A-theorists with an apparent dilemma. On the one hand, the following argument reinforces the impression that eternalism is unacceptable. According to sensible A-theories, objects have properties at times, or certain amounts of time ago/hence (on the metric tense operator view). So we can ask eternalist A-theorists: at those

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<sup>13</sup> Presentism is discussed sympathetically by Prior (1967 chapter VIII, 1968, 1998), Bigelow (1996), Zimmerman (1998, 2007), and Markosian (2004), and unsympathetically by Sider (1999; 2001, chapter 2; 2011: 239–246), and Lewis (2004). Williamson (2013 chapter 1), Sullivan (2012b) and Deasy (2015, 2017) argue the debate should focus on whether ‘permanentism’ is true (and claim that it is). Unlike those philosophers, I will investigate what to make of ‘presentism’ and ‘eternalism’ *given* my view of the fundamental facts.

times at which an object intuitively ‘no longer exists’, what properties does it have? Particles that intuitively ‘do not exist now’ do not now have any physical properties, like location, mass, or charge. Lacking all physical properties, such objects are now not ‘concrete’, according to an eternalist A-theory. (This view is defended under the label ‘permanentism’ by Williamson 2013, Sullivan 2012b, Deasy 2015; also relevant is Deasy 2017.) But surely objects that no longer have concrete properties do not still exist in a non-concrete, ghostly manner; they no longer exist (Zimmerman 1998: 212; 2007: 215–6).

On the other hand, presentism is also metaphysically unappealing. It holds that facts about the past can only concern presently existing objects. As we look back further into the past, fewer objects have survived, and so the facts about the receding past are increasingly merely qualitative. But surely specific individuals existed in the past in exactly the same way they exist now. If there are facts about individuals now, not just qualitative facts, then there are such facts about the past too (Hinchliff 2010: 102–5).

We can get out of this pickle. Let me give the vibe of the proposal in three paragraphs, before getting the details. Facts about what exists are not fundamental. Let’s focus on fundamental state facts, like: Phoebe was emitted at 8am. I define up *two* notions of existence, both restricted to objects that feature in the fundamental facts: *existence at a time*, and what I call  $\exists$ -*existence*. You can abstract away from the property Phoebe had at 8am, and get: Phoebe existed at 8am. Or you can abstract away from the property, and the time at which Phoebe had it, and the tense of her having it, and get: Phoebe  $\exists$ -exists. There are fundamental facts about what Phoebe was up to at 8am, and none about what Phoebe is up to now. That’s all it is for Phoebe to have

existed at 8am, and not exist now. There are fundamental facts about Phoebe, and that's all it is for Phoebe to  $\exists$ -exist.<sup>14</sup>

These two notions of existence are not equally enlightening. "Phoebe existed at 8am" accurately represents the fundamental temporal distinctions—the tense of the underlying fundamental state fact, and the time it concerns. In this sense, existence at a time 'carves nature at the temporal joints'. "Phoebe  $\exists$ -exists" abstracts away from the tense of the underlying fundamental fact, and the time it concerns.  $\exists$ -existence ignores the fundamental temporal distinctions. That's not the path to insight into the nature of time.

My account avoids the standard problems with presentism and eternalism, I will argue. Presentism is wrong: there are fundamental facts about objects that don't exist now, like Phoebe. Phoebe  $\exists$ -exists, but all that means is that there are fundamental facts about her (e.g. that Phoebe was emitted at 8am). There are no fundamental facts about what Phoebe is up to now, so she does not exist now. This view does not make Phoebe exist now but in a 'ghostly' way. It would be bizarre to label my proposal 'eternalist': Phoebe does not exist now, and so she is not 'eternal'. Thus I define 'presentism' and 'eternalism' so that my view counts as neither.

Let's get into the details. Truths about what exists—in either sense—are derivative, not fundamental. Consider first existence at a time. Existence is not a fundamental property of individuals. There are fundamental facts about what Phoebe was up to at various times, but there is no additional fundamental fact that Phoebe existed at those times. Existing is not 'something that things do all the time, like breathing, only quieter' (Austin 1962: 68 n. 1).

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<sup>14</sup> Fine takes a related view, explaining an object's being 'real' as its featuring in fundamental facts (Fine 2009: 171–2).

Let's stipulate that we are talking about notions of existence that are restricted to fundamental things. This will simplify the exposition. We might talk of what 'exists fundamentally' at a time, or what 'fundamentally  $\exists$ -exists', but I will typically omit the qualification. Careful: these restricted notions of existence are not 'fundamental' in the sense of there being fundamental facts about them.

It is easy to metaphysically explain truths about which individuals fundamentally exist at which times. Suppose there are fundamental facts about what  $o$  was like at  $t_1$ , but no fundamental facts about what  $o$  was like at  $t_2$ . Then that metaphysically explains why it is true that [ $o$  existed at  $t_1$ ], and true that [ $o$  did not exist at  $t_2$ ]. For example, there are fundamental facts about what Phoebe was up to at 8am, but not about what Phoebe is up to now, so it is true that Phoebe existed at 8am and does not exist now.<sup>15</sup>

If this account is to be plausible, metaphysical explanation must be a matter of explaining the truth and falsehood of claims, not grounding facts.<sup>16</sup> I suggested: since (fundamentally)  $o$  was F at  $t$ , 'that explains why it is true that'  $o$  existed at  $t$ . Not plausible:  $o$  existed at  $t$  'in virtue of'  $o$ 's being F at  $t$ . According to that grounding claim,  $o$ 's existence is an extra aspect of reality that's metaphysically posterior to  $o$ 's being some way; surely that's not so. This is reason to favour the truth-explaining meta-metaphysics. We'll see another reason momentarily.

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<sup>15</sup> The past tense in " $o$  was F at  $t$ " flavors the whole state of affairs, not just the having of the property. The state of affairs is 'gone', and so  $o$  may no longer exist.

<sup>16</sup> Broadly conceived, truth-explainers include: Cameron (2010), Sider (2011: 112–124), Williams (2012), and Author (Article1). Grounders include: Schaffer (2009, 2016), Rosen (2010), Bennett (2017), and deRosset (2023). Fine (2001, 2012) is harder to classify.

On this account, there are no fundamental facts about things how *are not* at the times they (intuitively) don't exist. For example, it must not be a fundamental fact that: Phoebe does not have mass 1kg now. I'll explain how this is possible three paragraphs further down.

The notion of existence I've just explained is a property of individuals (just not a fundamental property). Let's say that 'individual' notions of existence are properties of individuals, and 'quantificational' notions of existence concern the instantiation of properties. For example, [whether there was a photon at 8am] concerns a quantificational notion of existence. Individual existence at a time goes hand in hand with quantificational existence at a time: Phoebe was emitted at 8am, and that makes it true that Phoebe existed at 8am, and that there was something emitted at 8am.

Prima facie, quantificational truths about what there was at a time are also non-fundamental. When  $o$  was F at  $t$ , that metaphysically explains why it is true that [at  $t$ , something was F]. The explanation is less obvious when it is false that [at  $t$ , something was F]. Indeed, many philosophers think the falsity of existential statements cannot always be explained, and thus there are fundamental facts about what there is not.<sup>17</sup> For example, the fundamental facts about particular fundamental particles do not explain why it is true that there are no further fundamental particles. Nevertheless, I think we can explain the truth of such non-existence claims. I explain how in (Author, Article1); here's the idea. We can explain the truth of a non-existence claim, on the basis that certain facts—call them  $\phi\phi$ —jointly constitute fundamental reality. This only works on some conceptions of metaphysical explanation and fundamentality. Metaphysical explanation must be a matter of explaining the truth and falsehood of claims, not

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<sup>17</sup> E.g., Sider (2011: 203–6; 2020: 38–9), Amijee (2021).



grounding facts.<sup>18</sup> Fundamentality is not a matter of a fact's being ungrounded, but rather of some facts jointly being what's metaphysically real. Metaphysical explanation ultimately hits rock bottom with:  $\phi\phi$  are fundamental reality. That explainer says there is nothing more to fundamental reality. Thus that [ $\phi\phi$  are fundamental reality] explains why it is true that there are no more fundamental objects than those  $\phi\phi$  concern. That's the basic thought concerning truths about what there isn't; I'll adapt it to my A-theory momentarily.

Note the meta-metaphysical convergence: individual existence and quantificational existence are both best treated in a framework that explains the truth of claims, rather than one that grounds facts. Moreover, the approach to false existentials addresses the issue raised three paragraphs back, namely: why [Phoebe does not now have mass 1kg] is not among  $\phi\phi$ . In my view, there are no fundamental facts about how things are not, or were not. The fundamental facts are logically simple, and thus 'positive', not negated. That [ $\phi\phi$  are fundamental reality] explains why it is true that there are no more fundamental property-instances than those  $\phi\phi$  concern. It is not among  $\phi\phi$  that [Phoebe is 1kg now]. That would be fundamental if it were true. So [that  $\phi\phi$  are fundamental reality] explains why it is true that: Phoebe is not now 1kg.

That's the vibe of my (Article 1). Let's not rehash the details here. Instead, let's *suppose* I'm right: quantificational truths and falsehoods are all non-fundamental. In particular, truths about what there was at a time are non-fundamental, and are metaphysically explained in the following manner. When there is a fundamental fact of the form [ $o$  was F at  $t$ ], that metaphysically explains why it is true that [at  $t$ , something was F]. When, for fixed F and  $t$ , there is no object  $o$  such that fundamentally [ $o$  was F at  $t$ ], that metaphysically explains why it is true that [at  $t$ , nothing was F].

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<sup>18</sup> Footnote 16 gives references.

The absence of fundamental facts of the form [ $o$  was  $F$  at  $t$ ] is itself explained on the basis that  $\varnothing\varnothing$  are fundamental reality. As I said, we are restricting our notions of existence to fundamental things, to keep things simple.

The above accounts deliver the common-sense verdicts about what existed (fundamentally) at a time, and what there was (fundamentally) at a time. There are also truths about what (fundamentally)  $\exists$ -exists (*simpliciter*).  $\exists$ -existence is just a matter of there being a fundamental fact that concerns the relevant thing. That is, any fundamental fact about some thing,  $o$ , makes it true that:  $o$   $\exists$ -exists. Otherwise, it is false that  $o$   $\exists$ -exists. That's individual  $\exists$ -existence; the following introduces quantificational  $\exists$ -existence. Any fundamental fact about some thing,  $o$ , explains why it is true that there is (in this sense) something that is that way. I'll write this as follows: [fundamentally, ... $o$ \_\_\_] explains why it is true that  $\exists x(\dots x\_\_\_)$ . If none of the fundamental facts concerns an individual or time satisfying the relevant condition, that explains why it is false that  $\exists x(\dots x\_\_\_)$ . (In turn, it is true that none of the fundamental facts concerns an individual or time satisfying the relevant condition because:  $\varnothing\varnothing$  are fundamental reality.) There is no divorce between individual and quantificational  $\exists$ -existence: Phoebe  $\exists$ -exists iff a fact about Phoebe makes it true that  $\exists x(\dots x\_\_\_)$ . These accounts of individual and quantificational  $\exists$ -existence apply to times as well as individuals: [fundamentally,  $o$  was  $F$  at  $t$ ] explains why it is true that  $t$   $\exists$ -exists. However, I see no reason to extend the notion of existence at a time to times themselves, as well as to individuals that are some way then.

Given these conceptions of existence, how does the presentism–eternalism dispute look? Phoebe  $\exists$ -exists, and existed at 8am, but does not exist now. All that means is that there are fundamental facts about how Phoebe was at certain times, including 8am, but none about how Phoebe is now. There's nothing mysterious or paradoxical about that.

Don't read too much into the fact that Phoebe  $\exists$ -exists.  $\exists$ -existence abstracts away from the temporal distinctions found in the fundamental state facts. It abstracts away from the times at which objects have fundamental properties, and it abstracts away from the tense of that having.  $\exists$ -existence treats fundamentally different cases the same way; it 'cuts across nature's temporal joints'. This makes it convenient for formulating generalizations that apply to past, present and future—say in physics—but inappropriate for understanding the metaphysics of time. Talk of “what's in our ontology” or “what's in the domain of quantification” are just terminological variants of “what  $\exists$ -exists”; it ignores the fundamental temporal distinctions.

Unlike  $\exists$ -existence, truths about what existed at a time preserve the fundamental temporal distinctions. Phoebe existed at 8am; that abstracts away from what Phoebe was up to then, but not the time that the relevant fundamental fact(s) concerns, nor the pastness of that time. If we abstract away from the individual rather than the property, we get that there was something emitted at 8am. Again, the aspects relevant to the metaphysics of time are preserved. Truths about individual and quantificational existence at a time are not fundamental, but they still carve nature at the temporal joints. ('Carving nature at the joints' is often used as a synonym for being fundamental. In my usage, non-fundamental truths can 'carve nature at the temporal joints', by representing the fundamental temporal distinctions.)

Let's check that my account avoids the problems with presentism and eternalism. Presentism is false because it eschews fundamental facts about things that no longer exist. My

view does not make that mistake. Fundamentally, Phoebe was emitted at 8am, though Phoebe does not exist now.<sup>19</sup>

We saw two problems with eternalism. First: eternalism populates the world with ghostly individuals: things that ‘exist’ but have no concrete properties now. There is no such complaint against my proposal. Phoebe  $\exists$ -exists because Phoebe was some way at 8am. That’s all that Phoebe’s  $\exists$ -existence requires of fundamental reality. There’s nothing puzzling about Phoebe having been some fundamental way at some past time, but not being any fundamental way now. So given my metaphysical explanation for its truth, Phoebe’s  $\exists$ -existence does not make Phoebe ghostly now.

The second objection to eternalism is that it conflicts with A-theoretic common-sense: surely Phoebe does not exist anymore!<sup>20</sup> There is no such complaint against my proposal. Common-sense says that Phoebe does not *exist now*, and my proposal says that’s true. It is also true that Phoebe  $\exists$ -exists, but that does not conflict with common sense. Common sense agrees that there are fundamental facts about how Phoebe was at certain past times, and there’s nothing more to her  $\exists$ -existence than that.

What are presentism and eternalism, such that the above objections to them make sense? What creates the presentism–eternalism dilemma for A-theories, such that my view evades it? My suggestion: the presentism–eternalism dilemma assumes that  $\exists$ -existence carves nature at the temporal joints. That is: truths about what  $\exists$ -exists represent the temporal distinctions drawn by

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<sup>19</sup> I am inclined to treat modality differently to the past: there are no fundamental facts about individuals that intuitively do not exist but could have. The word ‘intuitively’ is there so as to contradict Williamson’s ‘necessitism’, which holds that what are intuitively mere possibilities actually exist (Williamson 2013).

<sup>20</sup> Presentism is common-sense, say Bigelow (1996: 35), Hinchliff (1996: 131), Zimmerman (1998: 214–5, but not quite in 2007 §7), Sider (2001: 11), Markosian (2004: 48), De Clercq (2006: 386).

the fundamental facts. Both presentism and eternalism build in that false assumption, and so both are false. Let me explain.

Our tradition typically assumes that the existential quantifier is the metaphysically privileged notion of existence, as Quine (1980/1948) taught. That's natural if you think quantificational logic—plus or minus tense operators—is metaphysically perspicuous. (§2 called this 'Logical Fundamentalism'.) Re-writing things in logical notation has been a common project in Analytic philosophy; that supposedly shows how things really are.

Intuitively, Phoebe is *gone*—Phoebe does not exist anymore, in a metaphysically central, temporal-joint-carving sense of existence. Presentists and eternalists follow tradition and assume (incorrectly) that the joint-carving notion is  $\exists$ -existence. So the intuition must be that Phoebe does not  $\exists$ -exist, both sides conclude. Presentists endorse the intuition that Phoebe is gone, and so deny that there are any fundamental facts about Phoebe. Eternalists go the other way, and say that Phoebe is not gone. Thus eternalism conflicts with common sense. Moreover, eternalism makes Phoebe puzzlingly ghostly. Eternalism says that Phoebe 'exists' in the sense which represents reality's temporal joints, and yet she lacks all concrete properties now. It's a puzzlingly ghostly kind of existence that Phoebe currently enjoys (assuming some kind of A-theory).

If  $\exists$ -existence carves nature at the temporal joints, then A-theories face the presentism–eternalism dilemma. This diagnosis is not original: Zimmerman (1998), Sider (2011: 239–246), and Sullivan (2012a §2, 2012b: 150) agree that the dilemma stems from metaphysically privileging  $\exists$ -existence. However, they accept that assumption, and think the dilemma is real. On my account,  $\exists$ -existence cuts across nature's temporal joints. The orthodox assumption is mistaken. Presentism and eternalism both build in the mistaken assumption, and so are both false.

It is a terminological choice to bake the mistaken assumption about  $\exists$ -existence into the definitions of ‘presentism’ and ‘eternalism’, but it is a good choice. It means that the two views have their standard implications, and makes it clear how my proposal escapes the dilemma. Moreover, it would be bizarre to use the label ‘eternalism’ for the view that past things  $\exists$ -exist. Phoebe existed at 8am and does not exist now; it would be perverse to label that a view on which Phoebe is ‘eternal’.

I hear a retort: “Phoebe is in your ontology, so this is eternalism!” But “what’s in your ontology” means that same as “what  $\exists$ -exists”. Those questions ignore the fundamental temporal distinctions. Sure, if you ignore the fundamental temporal distinctions my account draws, then it treats past objects like present ones. This observation is of limited import, and does not justify the label ‘eternalism’.

Resolving the presentism–eternalism dilemma in this way removes a central motivation for Prior-style tense operator A-theories. Presentism requires us not to refer to past times, because they are gone. In particular, we cannot say how things were at particular past times (my state facts). Metric tense operators are an appealing alternative: we say instead how long ago things were that way. Thus presentism motivates a metric tense operator view. But presentism is mistaken. There is no reason to avoid referring to past times, and a central motivation for tense operator views disappears.

## **5. Truth-makers for truths about the past**

A-theorists should hold that the past is gone, but there are facts about what happened. At 8am, Phoebe was emitted. That’s a fact, and a fundamental one. We should not think of that fact as part of the current state of reality: it’s a fact about the past, not the present. Unfortunately, A-

theorists have struggled to hold on to this common-sense view. The trouble comes if we assume that all claims are made true or false by the way reality *is*. Given an A-theory, this assumption bloats current reality unattractively. It entails that claims made now (say at noon) about 8am are made true by the way reality *is*. So facts apparently about the past should be thought of as current states of affairs, on this view. Any fundamental facts can make claims true, so the assumption here is that: fundamental facts only concern how things are now. In other words, only present states are fundamental. This is how I will understand the issue.<sup>21</sup> If only present states are fundamental, my A-theory is mistaken. Only present-tensed schemata would perspicuously represent fundamental facts, and I gave three past-tensed schemata. There would not be fundamental facts about past states (the example I will focus on), nor about the passing of periods of time, nor about cross-temporal relations.

Let's review two A-theories that assume that only present states are fundamental. John Bigelow (1996) holds that fundamentally, the world currently has backwards-looking properties, such as *having contained a photon 4 hours ago*. But surely the world currently has that backwards-looking property now *because* it had the property of *containing a photon* then, not vice versa (Sanson & Caplan 2010, Tallant & Ingram 2015). So the current backwards-looking state is not fundamental. Moreover, the fundamental facts concern things like particles and points of spacetime, not properties of the whole world, I suggest (*pace* Schaffer 2010).

Thomas Crisp's (2007) proposal makes the fundamental objects even less palatable. He posits fundamental facts concerning a binary relation that holds now between certain sets of propositions. If that relation holds now between two sets of propositions, we can say that: all the

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<sup>21</sup> Caplan & Sanson (2011) review this literature. The problem is often presented as one for presentism. There is some truth to this, I argue below, though non-presentists owe a response to certain arguments.

propositions in the first set were true-at-once before all the propositions in the second set were true-at-once. (Crisp's relation holds only between maximal sets of propositions, and he terms these sets 'ersatz times'.) Thus Crisp insists that some fundamental facts concern sets of propositions (2007: 106). But neither sets nor propositions are fundamental objects, it seems to me, let alone sets of propositions. Moreover, his proposal reverses the intuitive direction of metaphysical explanation. Surely sets of propositions stand in Crisp's relation now *because* of how the world used to be, not vice versa (Sanson & Caplan 2010, Tallant & Ingram 2015). So facts about Crisp's relation are not fundamental, contrary to his proposal.

Some A-theorists accept that only present states are fundamental, and bloat the current state of reality to account for truths intuitively about the past.<sup>22</sup> Other philosophers conclude that there is no coherent and well-motivated A-theory.<sup>23</sup> Surely these responses are mistaken. Current claims about Sam's events are made true or false by what happened then, not by what's happening now. This common-sense rebuttal is increasingly popular in the literature.<sup>24</sup> What's needed now is to debunk the appeal of the mistaken assumption. Why would an A-theorist think that only present states are fundamental? I discuss three possible culprits.<sup>25</sup>

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<sup>22</sup> Keller (2004) and Cameron (2015 chapters 3–4) consider A-theories according to which only present states are fundamental.

<sup>23</sup> E.g., Sider (2001: 35–42), and others cited by Caplan & Sanson (2011: 204 n. 6).

<sup>24</sup> Among those advocating for past (not present) truth-makers for claims about the past: Gallois (2004: 649), Tallant (2009), Sanson & Caplan (2010), and Tallant & Ingram (2015). I will argue that presentists are not entitled to this common-sense position.

<sup>25</sup> Here's a fourth reason to think that only present states are fundamental. According to some philosophers, A-theories must eschew cross-temporal facts (§7). So current claims could only be made true by current states of affairs. However, a blanket ban on cross-temporal facts is mistaken (§7), and a special ban in this case would be absurd.



The first culprit is presentism. Presentism says that since past objects like Phoebe are ‘gone’, there can’t be fundamental facts about them. But surely past objects are ‘gone’ because the past is ‘gone’, and that includes all past states of affairs. If presentism is developed into a principled package, it must be paired with the view that since past states are ‘gone’, there are no fundamental facts about them. Similarly, if future objects ‘are yet to be’, it is because the future is yet to be. So if presentism is true, it is because of a more general truth: only facts about present states are fundamental. Presentists are not entitled to the common-sense view that some fundamental facts concern past states.<sup>26</sup> Tallant & Ingram (2015) use the label ‘nefarious presentism’ for presentism combined with fundamental facts about the past; the position is objectionably unprincipled. If presentism is true, then facts apparently about the past must turn out to be facts about the present. Bigelow and Crisp are right about that conditional. But they are wrong to endorse presentism and infer the incredible consequence. It is time for *modus tollens*.

Second culprit: formulating the issues in terms of what’s ‘real’ can lead us astray. Many philosophers gloss the thought that the past is gone and the future is yet to be by saying: only the present is real.<sup>27</sup> But there can’t be fundamental facts about merely fictional scenarios—there can only be fundamental facts about states of affairs that are real. The following argument then needs to be addressed.

1. Only the present is real. (premise)

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<sup>26</sup> Here I disagree with Tallant (2009), Sanson & Caplan (2010), and Tallant & Ingram (2015).

<sup>27</sup> E.g., Prior (1998: 80), Hinchliff (1996: 122–3), Bigelow (1996: 48), Zimmerman (1998: 210, 2007: 211), Mellor (1998: 30), Sider (1999: 325, 2001: 11, 2011: 239), Lewis (2004: 4), Markosian (2004: 48), Sanson & Caplan (2010: 24), Cameron (2015: 9–11). Crisp (2007: 91) asks whether ‘the present things exhaust reality’, which suffers from the same ambiguity.

2. There can only be fundamental facts about scenarios that are real. (premise)
3. There can only be fundamental facts about the present. (inferred from 1 and 2)

In my view, the argument (1)–(3) equivocates on the meaning of the word ‘real’. ‘Real’ is a tremendously flexible context-sensitive expression (Austin 1962 section VII, Franklin 1986). Sherlock Holmes is not ‘real’, in the sense that he is fictional, merely imaginary; but he is a real character in Conan Doyle’s fiction, unlike Sherlock’s daughter Agatha Holmes (whom I just made up). Cheez Whiz is not ‘real’ in the sense that it is not cheese, but is ‘real’ in the sense that it is not imaginary. Bud Lite is not ‘real beer’, in the sense of proper beer, though it is technically speaking beer.

What the word ‘real’ means in a context is a matter of what being ‘real’ is contrasted with, argues R. L. Franklin (1986). In the case at hand, two contrasts are in play: between how things are now versus how they were or will be; and between how things were, are, or will be, versus merely fictional scenarios. The sense in which only the present is ‘real’ is not the sense in which the fundamental facts must concern what’s ‘real’. Start with premise (1). Only the present is ‘real’, I’d agree, in the trivial sense that only present states concern how things are now, as opposed to how things were or will be. But it is not the case that only the present is ‘real’, in the sense that anything else is merely fictional. It is not merely fictional that Phoebe was emitted at 8am. In that sense, the past is ‘real’. Now consider premise (2). There can’t be fundamental facts about scenarios that are not ‘real’, in the sense that the fundamental facts do not concern merely fictional scenarios. But there can be fundamental facts about states that are not ‘real’, in the sense of not being current states.

So the sense in which only the present is ‘real’ is not the sense in which the fundamental facts must concern ‘real’ scenarios. Without equivocating on the word ‘real’, there is no

argument here that there can only be fundamental facts about the present. Let's avoid the quicksilver word: my proposal is not framed in terms of what's 'real'.

A third suspect: reified talk about 'facts' is metaphysically misleading. It is a fact that at 8am, Phoebe was emitted. We talk about that fact in present-tensed terms: *it is* a fact; that fact obtains. These locutions are present-tensed, and so they make it sound as if they concern how things are now. They make it sound as if any fact is an aspect of current reality. In particular, fundamental facts would all concern present states.

Present-tensed reified locutions, like 'it is a fact', are metaphysically misleading. They sound as if they are talking about how things are now, but they are not. The aforementioned fact about 8am obtains, but that is not a matter of some current state of affairs bloating reality; it is solely a matter of what went on at 8am. The everyday notion of 'a fact' is 'minimal': we should treat 'it is a fact that *p*' as equivalent to '*p*'.<sup>28</sup> At 8am, Phoebe was emitted. I have not changed the subject-matter if I say that this fact obtains. So the obtaining of that fact is solely a matter of what went on at 8am.

Reified talk of facts is useful for stating generalizations, but it is not a metaphysically perspicuous way to characterize what's fundamental. My three schemata for stating fundamental facts do not reify facts. The metaphysically perspicuous statements are things like: 'at 8am, Phoebe was emitted'. These are the formulations to keep close.

## **6. The problem of temporary intrinsic properties**

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<sup>28</sup> I won't define the sense of 'equivalence' at play in characterizing minimalism about facts; the spirit of the view will do. Minimalism about facts is endorsed in the literature about time by Kierland & Monton (2007: 489), and is taken seriously by Lewis (1999: 216–7).

In my view, facts about past states concern the relevant times of instantiation, for example: *at 8am on day D*, Phoebe was emitted. These formulations are metaphysically perspicuous; they should not be analyzed in other terms. It is unorthodox to combine the use of tense with reference to the time of instantiation. There are two standard arguments that A-theories should not use the ‘at time  $t$ ’ formulation. The first is that A-theories should endorse presentism, and so cannot refer to past and future times. I dispatched presentism in §4.

The other stock objection to A-theories that refer to the time of instantiation is the so-called ‘problem of temporary intrinsics’, introduced by David Lewis.<sup>29</sup> Allegedly, my proposal makes shape (for example) a relation between a thing and a time, rather than a property as it should be. That is, temporary intrinsic properties have been eliminated, and replaced with relations (to times), it is alleged.

This is mistaken. The metaphysical form of the relevant fundamental facts is: *at  $t$ ,  $o$  was F*. Reifying predicates for a moment:  *$o$  had the relevant property at time  $t$* . The problem only arises if we don’t take this form of fact to be fundamental, but rather insist it must be analyzed in terms of having a property *simpliciter*. For then  $t$  would have to be built into the property predicated...or into the object of predication, or eliminated. (Those are exactly the options Lewis says we must choose between.) The worry only gets going if we refuse to take as fundamental claims of the form: *at  $t$ ,  $o$  was F*. But my A-theory holds that such claims are fundamental and unanalyzable.

Some may be dissatisfied with taking as fundamental facts of the form:  *$o$  was F at  $t$* . They may insist that if F-ness is a property, not a relation, then objects can be F *simpliciter*. It is supposedly not enough to have present-tensed fundamental facts of the form:  *$o$  is F at noon*.

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<sup>29</sup> On the problem of temporary intrinsics, see Lewis (1986: 202–4; 2002), Hinchliff (1996), Zimmerman (1998), Mellor (1998: 90–3), Sider (2001: 92–8), Wasserman (2003), Oderberg (2004), and Spencer (2016).

Allegedly, the present-tensed facts must be of the form: *o* is F. Tense operator A-theories have this feature. Some philosophers take this to be definitive of a real A-theory.<sup>30</sup> I am unmoved. We are talking about properties that things have *at a time*, even when that time is the present. This impression is reinforced by considering a contrasting case. Fundamental passage facts are not perspicuously represented with an ‘at time *t*’ clause, unlike state facts. 4 hours passed from 8am until noon *simpliciter*, not at 8am, or at noon, or at any other time. My proposal correctly contrasts the relationships that constitute the passing of time, which do not obtain at a time, with having a (temporary intrinsic) property *now*.

## **7. Fundamental cross-temporal relations**

Sensible A-theories should allow fundamental cross-temporal relationships. For one thing, classical physics needs them. (Sider 2001: 27–35, Maudlin 2012: 47–66.) In Galilean spacetime, acceleration is absolute but velocity is not. This requires cross-temporal facts, such as that one spacetime point is linearly between two others, or that some points of spacetime form an unaccelerated connected path. If an A-theory is compatible with classical physics, it allows fundamental cross-temporal relationships. Common-sense does not dictate that there are undetectable facts about whether something is at absolute rest; it is compatible with Galilean spacetime. So an A-theory that articulates common-sense should be compatible with positing the fundamental cross-temporal relationships Galilean spacetime needs.

A-theories should also allow there to be fundamental causal or nomic facts. Maybe the fundamental nomic facts are that certain generalizations hold by nomic necessity; then the nomic

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<sup>30</sup> Prior (1996: 47–8, 1998: 81); Zimmerman (1998: 208–9); compare Williamson (2013: 403–422), and Sider (2011: 247–265).

facts do not concern cross-temporal relationships. But maybe the fundamental nomic facts concern how earlier events nomically determine later ones (e.g. Demarest 2017). Then the fundamental nomic facts concern cross-temporal relationships (of nomic determination). A-theories should not rule out this view of nomic modality, and so they should allow fundamental cross-temporal relationships.<sup>31</sup>

Finally, isn't it obvious that the passing of time is a cross-temporal affair? A-theories had better be compatible with the passing of time. My fundamental passage facts concern the temporal relation between the relevant start and end points; that's a cross-temporal relationship. So if we accept my account of time's passing, we cannot balk at fundamental cross-temporal relationships in general.<sup>32</sup>

Unfortunately, orthodoxy says that A-theories are incompatible with fundamental cross-temporal relationships. One culprit: presentism (again). Presentism assumes that if there are fundamental facts about a thing, then it exists (in a joint-carving sense). In particular, fundamental cross-temporal relationships require all the relata to exist. According to presentism, Phoebe does not exist, nor does anything that intuitively does not exist now. But if there really were fundamental cross-temporal relationships, they would not be restricted to objects that intuitively exist now. For example, the cross-temporal relationships required by Galilean spacetime concern spacetime points that are in the past and future. Given presentism, only

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<sup>31</sup> De Clercq (2006) argues that there are no fundamental cross-temporal relationships. He does not consider the cross-temporal relationships needed by Galilean spacetime. He deals with causal relations by assuming that causal relations hold between facts rather than events, and that facts apparently about the past are really about the current state of reality (2006: 389). As we saw in §5, the latter assumption is mistaken.

<sup>32</sup> Facts about time's passing are cross-temporal, but they merit their own category. They are the *sine qua non* of temporal facts, in a sense I have not elucidated.

present spacetime points exist, and so the cross-temporal relations do not hold. Similarly, if causal relations hold between events that happen at different times, then presentism rules out causal relations, as the only events that exist happen now. So, if presentism is true, then there are no fundamental cross-temporal relationships. It is time for modus tollens (again).

Here's another argument that A-theories must eschew fundamental cross-temporal relationships. It does not obviously assume presentism.

1. Any fundamental cross-temporal relationship is a matter of some objects bearing a relation at some time.<sup>33</sup> (premise)
2. Some objects can bear a fundamental relation at a time only if they all exist then. (premise)
3. Fundamental cross-temporal relationships only hold between objects that all exist at the time of instantiation. (inferred from 1 and 2)
4. If there really were fundamental cross-temporal relationships, they would not be restricted to objects that exist at the time of instantiation. (as we saw in the preceding paragraph about presentism).<sup>34</sup> (premise)
5. There are no fundamental cross-temporal relationships. (inferred from 3 and 4)

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<sup>33</sup> Tense operator views add the possibility that cross-temporal relationships hold (present-tensed) *simpliciter*. The argument against cross-temporal relations can be extended to address this possibility. Some objects bear (present-tensed) a relation *simpliciter* only if they all exist *simpliciter*. But if a relation really were cross-temporal, it could hold between things that exist *simpliciter* and things that no longer do.

<sup>34</sup> One could deny (4), claiming that all objects exist at all times (Williamson 2013, Sullivan 2012b, Deasy 2015, 2017). My response better respects common sense.

This kind of argument is widely discussed, but without the restriction to *fundamental* relations.<sup>35</sup>

The literature discusses examples that are unlike fundamental cross-temporal relations; those examples are not relevant here.<sup>36</sup>

Once we consider relevant examples, the argument loses its appeal. Premise 1 is false: fundamental cross-temporal relationships are not a matter of some objects bearing a relation *at some time or other*. Suppose a spaceship traversed certain spacetime points between 9am and 10am, and those points formed an unaccelerated path. That doesn't mean that those points form an unaccelerated path *now*, nor at some other time. If nomic determination is a fundamental cross-temporal relationship, then it does not hold at a time. If the cause preceded the effect, then the 'making the effect happen' didn't occur at the time of the cause, nor of the effect, nor at any other time. Fundamental cross-temporal relationships do not hold at a time, so they do not require the relata to exist at some supposed time of instantiation; (3) is false. In this respect, cross-temporal relationships are like the facts about the passing of time. Fundamentally, four hours passed from 8am until noon. That doesn't mean that four hours passed from 8am until noon *now*, nor at any other time. It doesn't require 8am to exist now, nor that 8am and noon both exist at the same moment.

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<sup>35</sup> Amongst others, this kind of argument is discussed by Bigelow (1996: 37–9), Sider (1999: 328–9), Markosian (2004), Crisp (2005), Brogaard (2006), De Clercq (2006), Hinchliff (2010), Inman (2012), Ciuni & Torrenco (2013).

<sup>36</sup> Examples typically discussed are unlike *fundamental* cross-temporal relations. First: Bill Clinton admires JFK (citations in preceding footnote). That relation holds at some times and not others, and yet Bill Clinton can admire JFK even when JFK no longer exists. Surely that's got something to do with admiration being a representational matter. Representational matters are not metaphysically fundamental. Second: My daughter was taller at age two than my son was at age two (Brogaard 2006). That's true because of facts that are not cross-temporal: the facts about the daughter's height at age two, and the son's height at age two. The example does not suggest a fundamental cross-temporal relation.



Thus fundamental cross-temporal relationships are not perspicuously represented with an ‘at time  $t$ ’ clause. Other fundamental relations *do* hold at a time: that’s a kind of ‘state fact’. For example: *at 8am*, Peter and Penelope were 1 meter apart. If a fundamental relationship held at some time, then its relata existed then. But fundamental cross-temporal relationships are not of the sort that hold at a time. I accept (2) but deny (1). (2) is often termed what turns presentism into ‘serious presentism’;<sup>37</sup> in which case I accept the ‘serious’ but deny the presentism.

Why would anyone think that fundamental cross-temporal relationships must hold at some time? One suspect: assuming, as orthodox A-theories do, that all the fundamental temporal facts are perspicuously stated using tense sentence operators, such as ‘It was the case that  $p$ ’ or ‘It was the case 4 hours ago that  $p$ ’ (§2). The basic sentences to which tense operators apply are present-tensed and have no ‘at  $t$ ’ clause, like: ‘Peter and Penelope are 1 meter apart’. Tense operators take a claim intuitively about a state of affairs at one time, and transpose it to another time. Thus tense-operator views can only capture analogues of my state facts, where there is a specific time of instantiation, and not cross-temporal relationships (Sider 2001: 25–35). Others may conclude that there are no fundamental cross-temporal relationships. I conclude that tense operators cannot capture all the fundamental temporal facts.<sup>38</sup>

## 8. Conclusion

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<sup>37</sup> Sider (1999: 328–9 n. 8), Markosian (2004 §3.2), Crisp (2005: 7), Brogaard (2006: 195), Inman (2012: 56), Ciuni & Torrenco (2013: 236, using terms defined on 214).

<sup>38</sup> Brogaard’s (2007) ‘span operators’ don’t help. They allow us to state truths about how things were across a span of time, e.g. there have been three kings of England called Charles. Truths framed using span operators are non-fundamental, Brogaard asserts (p. 74), leaving tense operator views still without fundamental cross-temporal facts.

Philosophical arguments have led A-theorists to incredible views, but those arguments are fallacious. Freed from the mistaken constraints, a common-sense A-theory becomes possible. My proposal takes as fundamental facts like: [at 8am, Phoebe was emitted], [4 hours passed from 8am until noon], and some cross-temporal relationships. This A-theory attractively articulates our pre-relativistic conception of time.

I compared my proposal to a Prior-style metric tense operator A-theory (introduced in §2). The metric tense operator view should not be motivated by presentist scruples about referring to past times (§4), nor by a desire to replace instantiation at the present moment with instantiation simpliciter (§6). The view seems incompatible with the need for fundamental cross-temporal relationships (§7). It blends past states of the universe with the subsequent passing of time, which does not seem right (§3). In sum, there are reasons to prefer my proposed A-theory, and none to prefer the tense operator view. The tense operator view may be the best A-theory that builds on quantificational logic, i.e. accepts Logical Fundamentalism; but that's another assumption A-theorists should reject.<sup>39</sup>

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