

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 alleged impossibility of cross-temporal relations, and the problem of temporary intrinsics. 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. Then 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 literature about A-theories of time makes 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 find in the literature. The A-theories we are presented with are startling. *It is impossible for anything to come into or go out of existence*, we are told.¹ *There are no facts concerning things that have ceased to exist*, say others.² *Facts apparently about the past are really facts about the way things are now*, we hear.³ 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

¹ Williamson (2013, chapter 1), Sullivan (2012b), Deasy (2015, 2017), Cameron (2015). See §3 below.

² E.g., Prior (1967 chapter VIII, 1968, 1998), Bigelow (1996), Zimmerman (1998, 2007), and Markosian (2004). See §3 below.

³ E.g., Bigelow (1996), Crisp (2007), Cameron (2015). See §4 below.

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.)

This paper is for people who feel gaslit by the options A-theorists supposedly have to choose between. When a forest has become choked and dark, a severe fire burns it away, and new life springs up. Accordingly, this paper has destructive and constructive stages.

Destructively, I explain away the appeal of some standard arguments that push A-theories into gruesome forms. I address the presentism–eternalism dilemma, the problem of truth-makers, the alleged impossibility of cross-temporal relations, the problem of temporary intrinsics, and the assumption that predicate logic reveals the form of the fundamental facts (§§3–7 respectively). Aficionados may feel that these debates deserve a book rather than a paper, but my intended readers have no desire to read a whole book about views they cannot take seriously.

Constructively, I present a new A-theory that plausibly articulates our common-sense, pre-relativistic view of time. My positive proposal shows what’s possible once we move past the standard problems for A-theories. This A-theory posits fundamental facts about the state of the universe at particular times (§§2, 6), and about certain cross-temporal relationships (§5). My proposal also makes time’s passing 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 (§8). I will show why is this an appealing package of views, but I won’t argue exhaustively that this A-theory is preferable to every alternative in the literature. I will compare my proposal to one standard sort of view, of the kind proposed by Arthur Prior. There is value in articulating an intuitively attractive A-theory, freed from the old constraints, even if this paper does not defend it against all comers.

The next section sets the terms of the discussion. I explain how A-theories differ from B-theories, state how my A-theory conceives of fundamental facts about past states of the universe, and introduce a rival Prior-style A-theory (§2). The following sections work through the standard challenges for A-theories, explaining away their force (§§3–7). Finally, I state my proposed A-theory, and motivate its conception of time’s passing (§8).

2. Characterizing A-theories

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 the state of the universe at other times. 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, Peter and Penelope *are** 1 metre apart (where ‘are*’ is a tenseless form of the verb ‘to be’, and Peter and Penelope are elementary particles, and ‘D’ refers to yesterday). An A-theory might instead say: at 8am on day D, Peter and Penelope *were* 1 metre apart.⁴ 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, Peter and Penelope *are** 1m apart, as long as that’s because at 8am on day D, Peter and Penelope *were* 1m apart. 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.⁵ Twenty-first century metaphysics holds

⁴ As we’ll see, this suggested A-theory is unorthodox (§§3 & 6).

⁵ Tim Maudlin (2018) 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. This argument starts from a mistaken assumption: when we are 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, and so no-one should be taking 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.

that many traditional disputes really concern which facts are fundamental;⁶ it is unsurprising that we should understand the A-theory–B-theory dispute in this way too. But 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.

I will defend an A-theory according to which there are fundamental facts about how things were at past times, how things are now, and how things will be at times in the future. That is, there are fundamental facts of type 1, for which I give the past-tensed schema; you can fill in present- and future-tensed analogues.

(Type 1) At time *t*, object *o* was F (and certain relations held).

This schema is tensed, reflecting the metaphysical difference between past, present and future. This makes the proposal an A-theory. B-theories don’t use tenses to characterize the fundamental facts, because they deny that tenses mark real metaphysical differences. The full A-theory I propose in §8 adds two other kinds of fundamental fact, but we can make a lot of progress just considering facts of type 1.

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 type 1 facts all concern how things are at the same instant. 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, not of a matter of a special property the moment has. It doesn’t

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).

⁶ Metaphysics is approached through the lens of fundamentality by Kit Fine (2001, 2005, 2009, 2012), Jonathan Schaffer (2009, 2016), Ross Cameron (2010), Gideon Rosen (2010), Ted Sider (2011, 2020), Robbie Williams (2012), and Karen Bennett (2017). Like Fine, I will ascribe fundamentality primarily to facts rather than individuals. Officially, we avoid reifying facts by writing: ‘fundamentally, *p*’. Author (article1) defends my preferred conception of fundamentality and metaphysical explanation.

make sense to ascribe presentness without using the present tense, and the present tense renders a fundamental property of presentness otiose.^{7, 8}

In later sections, I will consider how a standard A-theory, of the style given by Arthur Prior, interacts with the topics I address. 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.⁹ ‘ $WAS(\text{Peter and Penelope are 1m apart})$ ’ translates as saying that they were 1m apart 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, ‘ $WAS(WAS(WAS(\text{Peter and Penelope are 1m apart})))$ ’ is a sentence. Second: *metric* tense operators formalize the claim that Peter and Penelope were 1m apart *four hours ago*, as follows: $WAS_M(4 \text{ hours, Peter and Penelope are 1m apart})$.¹⁰

I will focus on the Prior-style view that the fundamental temporal facts are to be stated using only *metric* tense operators.¹¹ Using only simple tense operators does not yield a rich enough collection of fundamental temporal facts. Even if simple tense operators could describe the full ordering of states of the universe (which I doubt)¹², 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

⁷ 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).

⁸ Deasy (2015: 2073; 2017: 378) defines the A-theory–B-theory dispute as the question of whether some time is absolutely present. It is better to focus on the disagreement about the fundamental facts, namely whether they are perspicuously stated using distinct tenses.

⁹ The *locus classicus* is the work of Arthur Prior (1967, 1968, 1991). Sider (2001: 11–17) summarizes the orthodoxy; also Sider (2011: 239–242).

¹⁰ Prior investigates metric tense operators sympathetically (Prior 1967 chapter VI; 1968: 8–11); also Creswell (2013).

¹¹ Compare Sider (2011: 240 n.4).

¹² 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).

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 motivation for using metric tense operators. I'll argue in §3 that this motivation for preferring a Prior-style view is mistaken.

Another difference: the schema for stating type 1 facts does not use any sentence operators. Sentence operators iterate. For example, it may be true (and allegedly fundamental) that: $WAS_M(2 \text{ hours}, WAS_M(2 \text{ hours}, \text{Peter and Penelope are } 1\text{m apart}))$. My view uses no iterating operator. 'At time t, \dots ' cannot be applied repeatedly: 'At 10am, at 8am, Peter and Penelope were 1m apart' is nonsense. Moreover, 'At time t, \dots ' is not a *sentence* operator, because it never operates on a sentence. On my view, 'Peter and Penelope were 1m apart' is not a complete sentence of the language for stating fundamental facts. (Nor is 'Peter and Penelope are 1m apart': the relevant fact concerns how things are *at a certain time*—see §6.)

More differences between my proposal and orthodox tense operator views will emerge. After I present my full A-theory—which posits three types of fundamental fact—I will summarize the key differences, and argue that my proposal has the advantage in every case (§8).¹³

3. The presentism–eternalism dilemma

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.¹⁴ I admit that my proposed A-theory is incompatible

¹³ One might complain that my proposal cannot yet be contrasted to the metric tense operator view, because I have not specified the 'logical form' of type 1 fundamental facts. I rebut this objection in §7.

¹⁴ Amongst others, 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), Lewis (2004). Sider (2011: 239–246) argues that the debate between presentists and eternalists is substantive, on the grounds that the existential quantifier carves nature at the joints; I will

with presentism. To state the fundamental facts of type 1, 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. Allegedly, positing these 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 surely A-theorists, who take seriously that the past is metaphysically gone, should hold that Phoebe no longer exists, and 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 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, momentum, 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 start with an outline. Facts about what exists are not fundamental. Type 1 fundamental facts concern individuals and times; truths about what exists

deny that premise. Williamson (2013 chapter 1), Sullivan (2012b) and Deasy (2015, 2017) argue the debate should focus on whether 'permanentism' is true. Unlike those philosophers, I will investigate what to make of 'presentism' and 'eternalism' *given* that the relevant fundamental facts are of type 1.

are metaphysically explained by them. In fact, there are two relevant notions of existence: the common-sense notion of *existence at a time*, and an esoteric notion I call \exists -*existence*. As I will explain, the notion of existence at time ‘carves nature at the temporal joints’, and we can agree with common sense about what exists when. But \exists -existence cuts across nature’s temporal joints; we must be careful not to mis-interpret the metaphysical significance of claims about what \exists -exists. My position respects all the relevant intuitions, and does not land us with puzzlingly ghostly individuals, I will argue. The way I define the theses, presentism and eternalism are both false, because they both build in a false assumption, namely that \exists -existence carves nature at the temporal joints.

I will assume that the 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); it would be if existence were a fundamental property of individuals.

Let’s stipulate that we are talking about notions of existence that only apply to fundamental things. We might talk of what ‘exists fundamentally’ at a time, or what ‘fundamentally \exists -exists’; I will typically elide the qualifier ‘fundamentally’ in the formulations that follow. It is easy to metaphysically explain the facts 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].¹⁵ (I use square brackets simply to indicate scope, not as a term-forming operator!)

The notion of existence I’ve just explained is a property of individuals (just not a fundamental property). For example, Phoebe existed at 8am and does not exist now. Let’s say that ‘predicative’ notions of existence are properties of individuals, and ‘quantificational’ notions of existence concern the instantiation of properties. For example, the familiar notion of what there is at a time is a quantificational notion of existence. That’s the sense in which there was a

¹⁵ Fine takes a related view, explaining an object’s being ‘real’ as its featuring in fundamental facts (Fine 2009: 171–2).

photon at 8am and maybe now there isn't. Predicative existence at a time goes hand in hand with quantificational existence at a time: Phoebe existed at 8am iff Phoebe can make it true that there was something of some sort at 8am. I am not driving a Meinongian wedge between what existed at a time and what there was then.

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]. Matters are more delicate when it is false that [at t , something was F]. Many philosophers think the falsity of existential statements cannot always be explained, and thus there are fundamental facts about what there is not (see Sider, 2011: 203–6; Sider, 2020: 38–9; Amijee, 2021). I am persuaded by Alex Jackson's argument to the contrary (Jackson, 2023). We can explain why an existential quantification is false, on the basis that certain specific facts are (jointly) the fundamental facts. This only works on some conceptions of metaphysical explanation and fundamentality, he argues. Metaphysical explanation must be a matter of explaining the truth and falsehood of claims, not grounding facts. Let's not get dragged too far afield. Let's just *suppose* Jackson is right: quantificational truths and falsehoods are all non-fundamental. In particular, truths about what there is at a time are non-fundamental, and are metaphysically explained as follows, yielding the intuitive results. 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 false that [at t , something was F]. (The absence of fundamental facts of the form [o was F at t] is itself explained on the basis that certain specific facts are (jointly) the fundamental facts.) As I said above, we are restricting our notions of existence to fundamental things, to keep things simple.

(The meta-metaphysics Jackson adopts to treat quantification sits particularly well with my account of predicative existence at a time. I suggested: since (fundamentally) o was F at t_1 , 'that explains why it is true that' o existed at t_1 .¹⁶ Also plausible: because (fundamentally) o was F at t_1 , 'the situation counts as one where' o existed at t_1 .¹⁷ Less plausible: o existed at t_1 'in virtue of

¹⁶ With this broad conception of metaphysical explanation: Cameron (2010), Sider (2011: 112–124), Williams (2012), Author (Article1).

¹⁷ Maybe this glosses Fine's conception of grounding (2001, 2012).

o 's being F at t_1 .¹⁸ That makes it sound like o 's existence is an extra aspect of reality that's metaphysically posterior to o 's being some way; surely that's not so. So predicative existence and quantificational existence are both better treated in a truth-explaining framework, rather than one that grounds facts.)

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. I introduce \exists -existence by the following stipulations. Any fundamental fact about some thing, o , makes it true that: o \exists -exists. Otherwise, it is false that o \exists -exists. That's (fundamental) predicative \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 $\exists x(\dots x_)$. There is no Meinongian wedge between \exists -existence and 'what there is' in the relevant sense: Phoebe \exists -exists iff Phoebe can make it true that $\exists x(\dots x_)$. These accounts of predicative 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. By contrast, 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 the above accounts, Phoebe \exists -exists, but does not exist now. All that means is that there are (type 1) fundamental facts about how Phoebe was at certain times, 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 cuts across distinctions in the fundamental facts that are crucial to the metaphysics of time. It abstracts away from the times at which an object has 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

¹⁸ With this broad conception of metaphysical explanation: Schaffer (2009, 2016), Rosen (2010), Bennett (2017).

past, present and future—say in physics—but inappropriate for understanding the metaphysics of time. (The same goes for talk about “what’s in our ontology”, which is just a terminological variant of “what \exists -exists”.)

By contrast, truths about what existed at a time preserve the distinctions relevant to the metaphysics of time. Phoebe existed at 8am; that abstracts away from what Phoebe was up to then, but not the time that the relevant fundamental facts concern, nor the pastness of that time. If we abstract away from the individual rather than the property, we get that something was emitted at 8am. Again, the aspects relevant to the metaphysics of time are preserved. Predicative and quantificational truths about 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; I have explained and motivated a different use of the expression ‘carving nature at the temporal joints’.)

Let’s check that my account avoids the problems with presentism and eternalism. Presentism is mistaken because it eschews fundamental facts about things that no longer exist. My view does not make that mistake. For example, it can be a type 1 fundamental fact that Phoebe was emitted at 8am.

There are 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, is, or will be some way at some time or other. 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 straightforwardly conflicts with common-sense: surely Phoebe does not exist!¹⁹ 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

¹⁹ 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).

are fundamental facts about how Phoebe was, 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. Both views build in that false assumption, and so both are false. Let me explain.

Intuitively, Phoebe is *gone*—Phoebe does not exist anymore, in a metaphysically significant, joint-carving sense of existence. Both sides 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 -exists, and assumes that that \exists -existence carves nature at the temporal joints. So Phoebe 'exists' in the sense which carves nature at the temporal joints, and yet she lacks all concrete properties now. It's a puzzlingly ghostly kind of existence that Phoebe enjoys (assuming some kind of A-theory).

So that's my diagnosis. \exists -existence is the sense of 'exists' in which if there are fundamental facts about Phoebe, then Phoebe 'exists'. The presentism–eternalism dilemma for A-theories results from assuming that \exists -existence is the joint-carving, metaphysically central notion of existence. Sider (2011: 239–246) and Sullivan (2012a §2, 2012b: 150) agree this with this diagnosis of the debate. Sider and Sullivan claim that the assumption is correct, but it is not. As I've explained, \exists -existence is not merely non-fundamental, it cuts across nature's temporal joints. Presentism and eternalism both build in the mistaken assumption, and so are both false. (It is a terminological choice to bake the false assumption 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.)²⁰

²⁰ I am inclined to treat modality differently to the past: there are no fundamental facts about individuals that intuitively do not actually exist. The word 'intuitively' is there so as to contradict Williamson's 'necessitism', which holds that what are intuitively mere possibilia actually exist (Williamson 2013).

Resolving the presentism–eternalism dilemma in this way removes a central motivation for Prior-style tense operator A-theories. Presentism requires us to reject type 1 fundamental facts, and a metric tense operator view is an appealing alternative. Statements of type 1 fundamental facts refer to past times, to say how things were at those times. Presentism requires us not to refer to past times, because they are gone. Metric tense operators allow us to say how things were, without referring to the time at which things were that way; instead we say how long ago things were that way. Thus presentism motivates a metric tense operator view. But presentism is mistaken—we cannot do without fundamental facts concerning things that no longer exist. Given my resolution of the presentism–eternalism dilemma, there is no reason to avoid referring to past times. A central motivation for tense operator views disappears.

Let's close by rebutting two objections. What does 'Phoebe' refer to, if Phoebe does not exist now? That name refers to Phoebe. Referring can be a cross-temporal affair, and the referent need not exist when the act of referring occurs. It is a platitude that we can think and talk about a past that is no more. It is correspondingly bizarre to think that we can talk about the past only by talking about things that exist now.²¹

How can there be facts about things that no longer exist? If there are facts about Phoebe, then the constituents of those facts must exist now too, one might think. Here's the short answer, expanded upon in the next section. It is a fact that at 8am, Phoebe was emitted; but it is a fact about the past and not about the present. Its being a fact is not a matter of some current state of reality. Its being a fact is solely a matter of how things were at 8am. Its being a fact requires that Phoebe existed then, and not that Phoebe exists now.

4. 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, particles Peter and Penelope were 1m apart. 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

²¹ §5 argues that there are *fundamental* cross-temporal affairs. Referring is not fundamental, and so won't be an example I discuss.

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. Given that any fundamental facts can make claims true, 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.²²

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 dinosaurs* (that's his example, ignore the non-fundamentality of dinosaurs). But surely the world currently has that backwards-looking property *because* it used to have the property of *containing dinosaurs*, 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 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 (as did Bigelow's). 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.²³ Other philosophers conclude that

²² Caplan & Sanson (2011) review this literature. The problem is often presented as one for presentism. I argue below that this is broadly correct, though non-presentists owe a response to certain arguments.

²³ Keller (2004) and Cameron (2015 chapters 3–4) consider A-theories according to which only present states are fundamental. Kierland & Monton think 'the shape of the past' is not a matter of 'things and how

there is no coherent and well-motivated A-theory.²⁴ Surely these responses are mistaken. Current claims about 8am'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.²⁵ 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 will discuss three possible culprits.²⁶

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. 'Goneness' means there are no relevant fundamental facts, presentism implies, given what it says about Phoebe's goneness. Presentism must hold that since the past is 'gone', there are no fundamental facts about it, on pain of incoherence. 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 how things were. Facts apparently about the past must turn out to be facts about the present. Bigelow and Crisp are right about that.²⁷ But they are wrong to endorse presentism and infer the exasperating 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

things are', but is some other kind of 'present aspect of reality' (2007: 486 n. 3, 491–2). I reject this distinction.

²⁴ E.g., Sider (2001: 35–42), and others cited by Caplan & Sanson (2011: 204 n. 6).

²⁵ 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 the common-sense position.

²⁶ Here's a fourth reason to think that only present states are fundamental. According to some philosophers, A-theories must eschew cross-temporal facts (§5). So current claims could only be made true by current states of affairs. However, a blanket ban on cross-temporal facts is mistaken (§5), and a specific ban in this case would be absurd.

²⁷ Here I disagree with Tallant (2009), Sanson & Caplan (2010), and Tallant & Ingram (2015). Tallant & Ingram (2015) call the combination of presentism with fundamental facts about the past 'nefarious presentism'. I have argued that nefarious presentism is not coherent.

present is real.²⁸ 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)
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)

If presentism is true, then this is a sound argument, when 'real' is interpreted as contrasting with what's 'gone'. Presentists should then endorse both premises, and thus the conclusion.

Things look different if the relevant fundamental facts are of type 1. The argument (1)–(3) equivocates on the meaning of the word 'real'. 'Real' is a tremendously flexible context-sensitive expression (Franklin 1986, Austin 1962 section VII). 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 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 things that are not

²⁸ 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.

‘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. The easiest way to avoid getting muddled is to 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, Peter and Penelope were 1m apart. We talk about that fact in present-tensed terms: *it is a fact*; that fact obtains; *its being* a fact cannot be metaphysically explained in more fundamental terms. 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*’.²⁹ At 8am, Peter and Penelope were 1m apart. 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. In §2 I gave a schema for stating fundamental facts about past states, and it does not reify facts. The metaphysically perspicuous statements are things like: ‘at 8am, Peter and Penelope were 1m apart’. These are the formulations to keep close.

Mischief can occur if we equivocate on the expression ‘state of affairs’; I regiment it as follows. ‘States of affairs’ are things that obtain at a time; they are a matter of things bearing properties and relations at that time. Fundamental facts of type (1) concern the obtaining of states

²⁹ 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).

of affairs at various times. Thus some fundamental facts concern current states of affairs, but many do not. If Peter and Penelope are 5 metres apart at the present moment, that's a fact about a current state of affairs. But if Peter were Penelope were 1m apart at 8am, that's a fact about a state of affairs that obtained at 8am. That's a fact about the past state of reality, and not the current state of reality. This is not mysterious or paradoxical: it is a platitude that the past is gone but there are facts about what happened.³⁰

5. Fundamental cross-temporal relations

Sensible A-theories should allow fundamental cross-temporal relationships. For one thing, classical physics needs them. (Sklar 1974: 202–9, Sider 2001: 27–35, and 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.

Let me give another example of cross-temporal relationships that sensible A-theories should not automatically rule out. A-theories should 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 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). Sensible A-theories should not automatically rule out this view of nomic modality, and so they should allow fundamental cross-temporal relationships.³¹

³⁰ §§5 & 8 will add other kinds of fundamental fact that do not concern the current state of reality.

³¹ 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 §4, the latter assumption is mistaken.

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, and thus with cross-temporal facts. This argument will be sharpened in §8, where I propose that the passing of time is a matter of relationships between different times.

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 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).

There are other arguments that A-theories must eschew fundamental cross-temporal relationships, arguments which do not obviously assume presentism. Let's consider one, of a sort that is frequently discussed.³²

A cross-temporal relationship is a matter of some objects bearing a relation at some time.³³ Some objects can bear a relation at a time only if they all exist then. So cross-temporal relationships only hold between objects that exist at the same time. But if there really were fundamental cross-temporal relationships, they would not be restricted to

³² Amongst others, this kind of argument is discussed by Bigelow (1996: 37), Sider (1999), Markosian (2004), Crisp (2005), Hinchliff (2010), Brogaard (2006), De Clercq (2006), Inman (2012), Ciuni & Torrenco (2013).

³³ 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 a relation (present-tensed) *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 in the past and future.

objects that exist at the same time (as we saw in the preceding paragraph about presentism).³⁴ So there are no fundamental cross-temporal relationships.

This argument loses its appeal once we look at relevant examples, that is, of plausibly *fundamental* cross-temporal facts.³⁵ 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 any 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 are not perspicuously represented with an 'at time t ' clause, unlike type (1) facts. The fundamental relations type 1 facts concern *do* hold at a time. For example, the relation of being separated by 1m held between Peter and Penelope *at 8am*. If a fundamental relationship holds at a time, then its relata exist then. But fundamental cross-temporal relationships are not of the sort that hold at a time. They do not require the relata to exist now or at any other single time. Certain spacetime points formed an unaccelerated path. That doesn't require all those points to exist now, nor that they all exist at the same moment.³⁶

³⁴ One could respond that all objects exist at all times (Williamson 2013, Sullivan 2012b, Deasy 2015, 2017). My response preserves common sense.

³⁵ The examples typically discussed strike me as deeply unlike *fundamental* cross-temporal facts. First: Bill Clinton admires JFK (citations in footnote 32). 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). This fact holds in virtue 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 fact.

³⁶ The same goes for the facts about the passing of time that I will introduce in §8. 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.

When we consider appropriate examples, the argument against cross-temporal relations has no force. Why would anyone think that all 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 1m 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 type (1) 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.³⁷

6. The problem of temporary intrinsic properties

In my view, facts about past states concern the relevant times of instantiation, for example: *at 8am on day D*, Peter and Penelope were 1m apart. These type 1 formulations are metaphysically perspicuous; they should not be analyzed in other terms. They are the most natural and easy way to specify when the state obtained (though one could instead use metric tense operators like ‘It was the case 4 hours ago that p ’).

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, because they do not ‘exist’. I argued against presentism in §3, showing that there is no problem with referring to other times.

The other stock objection to A-theories that refer to the time of instantiation is the so-called ‘problem of temporary intrinsics’.³⁸ 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.

³⁷ Brogaard’s (2007) ‘span operators’ won’t help. Truths framed using them are non-fundamental, she says (p. 74), leaving tense operator views still without fundamental cross-temporal facts.

³⁸ 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).

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 object of predication or the property predicated. That is, the worry only gets going if we refuse to take as fundamental claims of the form: at t , o was F. But my view is that such claims are fundamental and unanalyzable.

David Lewis introduced the problem of temporary intrinsics (Lewis, 1986: 202–4; 2002). I do not intend to die on the hill of Lewis-interpretation. Still, my characterization of the problem fits with how he introduces it in the following passages. I interpret them as demanding an analysis for claims of the form: at t , o was F.

How is such change [of intrinsic properties] possible?... It is *not* a solution just to say how very commonplace and indubitable it is that we have different shapes at different times.

To say that is only to insist—rightly—that it must be possible somehow. (Lewis 1986: 204)

How can one and the same thing have contrary intrinsic properties? How does it help that it has them at different times? (Lewis 2002: 1)

My interpretation of Lewis's problem is supported by his candidate solutions, all of which reduce instantiation at a time to instantiation *simpliciter* (Lewis 1986: 202–4, 2002: 1–4). In particular, he concludes that instantaneous objects ('temporal parts') are the real bearers of properties—*simpliciter*.

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. 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.³⁹ I am unmoved. We

³⁹ Prior 1996: 47–8, 1998: 81; Zimmerman 1998: 208–9; compare Williamson 2013: 403–422, and Sider 2011: 247–265.

are talking about properties that things have *at a time*, even when that time is the present. That seems exactly right. This impression is reinforced by considering contrast cases. §5 argued that there are fundamental cross-temporal relations, and these are not borne at a time. §8 will argue that there are fundamental facts about the passing of periods of time, and they are not a matter of a state obtaining at a time. My proposal correctly contrasts these relationships, which do not obtain at a time, with having a temporary intrinsic property *now*.

7. ‘Logical form’ and fundamental metaphysics

The problems we have disposed of in §§ 3, 5 and 6 might be resuscitated using the concept of logical form. Start with the problem of temporary intrinsics. What is the logical form of ‘at *t*, *o* was F’? Is it: *Rot*, i.e. that *o* and *t* stand in some relationship? If so, then I have replaced intrinsic properties with relations—relations to times. The presentism–eternalism dilemma is also resurrected. If the logical form of ‘at *t*, *o* was F’ is: *Rot*, then *o* and *t* both exist in a sense that carves nature at the joints, one might think. The problem of cross-temporal relations would thus be revived: cross temporal relationships would entail that the relata must exist in a sense that carves nature at the joints. If I don’t specify the ‘logical form’ of the fundamental facts I posit, then I haven’t given a regimented metaphysical thesis, it has been alleged.

Let’s start by rebutting this final thought. I have specified the *metaphysical* form of the fundamental facts. The metaphysical form of facts about past states is: at *t*, *o* was F. More abstract characterizations are not metaphysically enlightening—they leave out metaphysically significant aspects. Abstracting further than [at *t*, *o* was F], to a relationship holding between two entities, is metaphysically misleading. For one thing, it erases the difference between an object having a property at a time, and two objects being related *simpliciter*. This distinction matters, and there are fundamental facts of the second kind too: cross temporal relationships obtain *simpliciter*, not at a particular time (§5). I have specified the form of the fundamental facts at the right level of abstraction for metaphysics. A more abstract kind of ‘logical form’ may be relevant to logic, but it cuts across nature’s temporal joints.

One might argue that we need to specify the logical form of the fundamental facts, because we need to explain why those facts have the existential implications they do. That’s the job of logical form, one might claim. I reply that the metaphysical form of the facts explains their existential implications (§3). That [at 8am, Phoebe was emitted] makes it true that Phoebe existed

at 8am. The explanatory generalization here is that facts of the form [at t , o was F] make it true that [at t , o existed]. A more abstract characterization of [at 8am, Phoebe was emitted], say as having the form [R o t], cannot explain why it is true that [at 8am, Phoebe existed]. There is no job here for a notion of ‘logical form’ distinct from metaphysical form. What about \exists -existence? That [at 8am, Phoebe was emitted] makes it true that Phoebe \exists -exists. The abstract generalization is that any fundamental fact about a thing, o , makes it true that o \exists -exists. This is no reason to posit a logical form for ‘at 8am, Phoebe was emitted’ that captures only that the fact concerns Phoebe. So again, there is no argument here against my view of the metaphysical form of the fundamental facts.

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’. Philosophers of this stripe include Sider (2001: xvi–xxiv, 2011: chapters 9–11 esp. pp. 182–8), Sullivan (2012b: 150), and Deasy (2017: 380–1). Logical Fundamentalism endorses the following two claims, and so is incompatible with type 1 facts being fundamental. First, fundamental properties are instantiated *simpliciter*, not at a time. Second, the individuals the fundamental facts concern all exist, in the sense of existence that carves nature at the joints.

I feel relaxed about clashing with Logical Fundamentalism. I want an A-theory to articulate the common sense view of time. Common sense approves of type 1 fundamental facts, and not of Logical Fundamentalism. Sider’s master argument for Logical Fundamentalism is that our best scientific theories are framed in a language of first-order logic (2011: 188; 2020: 42). Logical Fundamentalism only follows if the relevant scientific facts are metaphysically fundamental, but on my view, that is not so (§3). Quantificational truths concerning \exists and its dual, \forall , are non-fundamental. \exists and \forall are good for generalizing across past, present, and future, precisely because they cut across nature’s temporal joints. The account in §3 is attractive, but I merely supposed we can metaphysically explain false existential and true universal generalizations (maybe in the manner suggested by Jackson 2023). If that supposition is correct, then Sider’s argument for Logical Fundamentalism fails.

8. My proposed A-theory

Let's change gear, and enter the more constructive stage of the paper. 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.⁴⁰

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 .⁴¹ A-theorists will tense the verb 'to pass', saying for example: 4 hours *passed* from 8am on day D until noon on day D. In general, A-theorists use the past tense to reflect that the past is *gone*. Past periods of time are gone, and our A-theorist will use the past

⁴⁰ In my view, it is most metaphysically perspicuous to use variable-like 'new names' for times (Author, MS). This helps to capture the structuralist idea that 'there is nothing more to a time' than the temporal relationships it stands in.

⁴¹ 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).

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 it is a period that 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 of an A-theory that treats time's passing as a fundamental phenomenon. Surely. 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.

Putting it all together, my proposed A-theory holds there are three types of fundamental fact, for which I give the past-tensed schemata; you can fill in present- and future-tensed analogues.

(Type 1) At time t , object o was F (and certain relations held).

(Type 2) Objects o_1, \dots, o_n were R-ly related. [This schema is for cross-temporal relationships]

(Type 3) Amount of time T passed from time t_1 until time t_2 .

All three schemata are tensed, reflecting the metaphysical difference between past, present and future. This makes the proposal an A-theory. B-theories don't use tenses to characterize the fundamental facts, because they deny that tenses mark real metaphysical differences.

My proposed A-theory does a good job of articulating the common-sense view of time. It seems exactly right that there are fundamental facts of type 1, and §6 reinforced that impression. Type 2 facts concern fundamental cross-temporal relationships. These relationships do not hold at a time, unlike the relations that type 1 facts concern. §5 argued that A-theorists should allow for fundamental facts of type 2. The first half of this section motivated fundamental facts of type

3. (Remember, §2 argued that we don't need a fundamental fact about what time has the property of being present.)⁴²

A word about how type 2 facts and type 3 facts relate. Type 3 facts, about time's passing, are not facts about how things are at some moment. They are facts about the period of time between the relevant start and end points; they are cross-temporal facts.^{43, 44} So if we accept my account of time's passing, i.e. facts of type 3, we cannot balk at fundamental cross-temporal relationships in general. This confirms that we were right, in §5, to allow fundamental facts of type (2).

Let's compare this proposal to a Prior-style A-theory. The metric tense operator view contradicts my proposal about which facts are fundamental. My view says that there are fundamental facts like: [At 8am, Peter and Penelope were 1m apart] and [4 hours passed from 8am today until noon]; the tense operator view denies this. The tense operator view says that there are fundamental facts of the form: $WAS_M[4 \text{ hours, Peter and Penelope are 1m apart}]$; my proposal denies this. My proposal treats $WAS_M[4 \text{ hours, } p]$ 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 type 1 facts concern 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 prima facie my proposal is preferable. Intuitively, what

⁴² The proposed A-theory is incompatible with Special and General Relativity. There is no such thing as absolute simultaneity, according to those scientific theories, hence there are no such things as times. Moreover, no absolute amount of time separates distinct points of spacetime. Can something of the spirit of my A-theory can be preserved given Relativity? That's a question for another day.

⁴³ Facts about time's passing are cross-temporal, but they merit their own category. In some sense, they are the sine qua non of temporal facts.

⁴⁴ Fine (2005) seems to assume that the fundamental facts all concern states that intuitively obtain at a time. That leaves out the facts about time's passing.

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 seems to deny the intuition. On that view, how things were at 8am is fundamentally blended with the subsequent passing of 4 hours.

The metric tense operator view should not be motivated by presentist scruples about referring to past times (§3), 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 (§5). Nor does it seem right to blend the way things were with the subsequent passing of time, we have just seen. In sum, there is reason to prefer my proposed A-theory, and no reason to prefer a metric tense operator view.

Let's end by considering an objection. One might object that the proposed fundamental facts about time's passing are not suited to an A-theory. A-theories must endorse a conception of passage that's peculiarly robust and hence incompatible with B-theories, goes the worry. Yet B-theories can adopt the fundamental facts about passage that I have proposed, or close enough. Familiar B-theories say that 8am today is* four hours earlier than noon (using a tenseless 'is*'). A B-theory can say instead that four hours pass* from 8am today until noon (using a tenseless 'pass*'). Such a B-theory has the same conception of time's passage as I have proposed, it is alleged. So an A-theory needs a more robust conception of passage than I have supplied; so goes the objection.

A B-theory can say there are fundamental facts like: four hours pass* from 8am until noon.⁴⁵ But, I reply, such a B-theory does not share its conception of time's passing with my A-

⁴⁵ Typical B-theorists say that fundamentally, 8am on day D is* 4 hours earlier than noon on day D. (For example: Smart (1998), Mellor (1998, chapter 1), Sider (2001, chapter 2).) Is that any different from saying that fundamentally, 4 hours pass* from 8am on day D until noon on day D? I'm not sure. Both build a direction into the fundamental facts about temporal separation (unlike C-theories—see Farr 2020). One might choose to say that time 'passes' to endorse a deeper disanalogy between space and time; I give two examples. First: time is the dimension of 'real change', whereas difference across space is 'mere variation' (Mellor 1998: 6, 70–1, 84). Second: metaphysically fundamental, non-Humean laws of nature 'govern' how the universe evolves along the temporal dimension, not along some spatial dimension, and this flows

theory. How a theory conceives of time's passage does not just depend on the use of the word 'passes'; it depends on how the theory connects time's passage to other phenomena. Theoretical terms get their meanings from the whole theories in which they are embedded (Lewis 1970). For example, part of how sub-atomic theory conceives of electrons is that they attract protons. Partially theoretical terms, like 'passes', have their conceptions refined by the whole theories in which they are embedded. My A-theory connects the passing of time to the metaphysical distinction marked by tenses. The present-tensed facts all concern one time; call it 'now'. A pattern holds in the fundamental facts: for all times t , the type 1 facts concerning t are past-tensed iff some time has passed from t until now. This connection with presentness and gone-ness is part of how my A-theory conceives of the passing of time. A B-theory denies that past and present differ in metaphysical status, and so rejects this connection. For a B-theory, that 4 hours pass* from 8am until noon does not imply that 8am is 'gone'. So my A-theory conceives of time's passing differently than any B-theory.

9. Conclusion

Philosophical arguments have led A-theorists to incredible views, but those arguments are fallacious. Freed from the old mistaken constraints, we can formulate a more common-sensical A-theory. My proposal takes as fundamental facts like: [at 8am on day D, Peter and Penelope were 1m apart], [4 hours passed from 8am on day D until noon], and some more cross-temporal facts. This A-theory attractively articulates our pre-relativistic conception of time. It is an overlooked option that should be taken seriously.⁴⁶

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from the natures of space and time. (Maudlin 2007: chapter 1 and pp. 109–110, 130–135; compare Demarest 2017; contrast Loewer 2012.)

⁴⁶ Acknowledgements...

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