A Better A-Theory

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Abstract: I present a new kind of A-theory. 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 given time, and about cross-temporal relationships. The proposed metaphysical package attractively articulates our pre-relativistic conception of time. I defend the proposal from a number of orthodox objections: fundamental facts need not be aspects of current reality (§2); our package can and should posit fundamental cross-temporal relationships (§3); it resolves the difficulty of choosing between 'presentist' and 'eternalist' A-theories (§4); it evades the so-called 'problem of temporary intrinsics' (§5).

Keywords: A-theories of time, passage of time, presentism, metaontology, cross-temporal relations, truthmakers, temporary intrinsics.

1. The A-theory we'll explore

What metaphysical theory articulates our common sense, pre-relativistic conception of time? Presumably it will be an A-theory. But it won't be one of the A-theories proposed in the literature: philosophical arguments lead them to make counter-intuitive claims. I shall present a more natural A-theory, and rebut arguments that have lead A-theorists away from such a view. Even if you aren't converted to the cheerful iconoclasm I recommend, I hope you'll agree that I've articulated an intuitively attractive and under-explored 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 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.[1] 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. An A-theorist can admit that some facts about other times are perspicuously represented tenselessly, as long as those facts are derivative, and metaphysically explained by fundamental facts perspicuously represented using tenses. For example, an A-theorist can admit that at 8am on day D, Peter and Penelope are 1m apart (where 'are' is tenseless), as long as that's because at 8am on day D, Peter and Penelope were 1m apart. Twenty-first century metaphysics interprets many traditional disputes as properly concerning which facts are fundamental;[2] it is natural to 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; in some cases they no longer make sense.

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

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[1] A-theories are often assumed not to talk about times, but I will reject this constraint.

[2] Metaphysics is approached through the lens of fundamentality by Kit Fine (2001, 2005, 2009, 2012), Jonathan Schaffer (2009), Ross Cameron (2010), Gideon Rosen (2010), Ted Sider (2011, 2020), Robbie Williams (2012), and Karen Bennett (2017). Like Fine, I ascribe fundamentality primarily to facts rather than individuals. Officially, we avoid reifying facts by writing: 'fundamentally, *p*'.

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 particular 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 shall explore an A-theory that treats time's passing as a metaphysically fundamental aspect of reality. Our analysis of time's passing suggests the following sharpened proposal. On this kind of A-theory, facts of the following form are metaphysically fundamental: amount of time T passed from time t_1 until time t_2.[3] A-theorists will tense the verb 'to pass', saying for example: 4 hours pass*ed* 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 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.

A-theories need an attractive characterization of passage, and the last two paragraphs arrived at an utterly natural view. To my knowledge, no A-theorist has defended this view of passage before. I shall explore it in the setting of a particular A-theoretic package. This package

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[3] 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).

holds there are at least three types of fundamental fact, for which I give the past-tensed schemata; you can fill in present- and future-tensed analogues.

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

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

(3) Objects o_1, …, o_n were R-ly related.

(3) captures certain cross-temporal relationships. They do not hold at a time, unlike the past states of the universe described using (2)—see §3.

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.

How does my proposal differ from orthodox A-theories, which use tense sentence operators to state the fundamental temporal facts? There are two kinds of tense sentence operators. *Simple* (non-metric) tense sentence operators include WAS(p), WILL(p), and maybe some others.[4] 'WAS(Peter and Penelope are 1m apart)' translates as saying that they were 1m apart at some time or other, though this approach does not itself talk about times. The basic sentences to which tense operators can 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(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: WAS$_M$[4 hours, Peter and Penelope are 1m apart].[5]

I will focus on the view that the fundamental temporal facts are to be stated using only *metric* tense operators.[6] Using only *simple* tense operators does not yield a rich enough collection of

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

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

[6] Compare Sider (2011: 240 n.4).

fundamental temporal facts. Even if simple tense operators could describe the full ordering of states of the universe[7], they wouldn't capture the temporal metric. I can move my arm though 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 'double'). Given fundamental facts stated using metric operators, we should not add further fundamental facts stated using simple tense operators: they would be objectionably redundant.

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 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. (I use square brackets just to indicate scope.) It is true that [4 hours ago, p] because: [at 8am, p], [4 hours passed from 8am until noon], and the present-tensed fundamental facts concern how things are at noon. The last conjunct captures its 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. By contrast, the tense operator view holds that the passing of those 4 hours is a consequence of 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. The tense operator view says that fundamentally, WAS_M[4 hours, Peter and Penelope are 1m apart]. Thus the past state is not fundamentally separate from the subsequent passing of 4 hours until the present, unlike on my proposal. This is a significant metaphysical disagreement. Prima facie, my proposal is preferable. Intuitively, what happened at 8am is fixed independently of what happened later, including the subsequent passing of four hours. My proposal endorses this intuition, while the metric tense operator view seems to deny it.

Another difference: my proposal does not use a sentence operator to state the fundamental facts. Metric sentence operators iterate. For example, it is true (and allegedly

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[7] 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).

fundamental) that: WAS$_M$[2 hours, WAS$_M$(2 hours, Peter and Penelope are 1m apart)]. My view uses no iterating operator. In particular, 'At time *t*, …' cannot be applied repeatedly: 'At 10am, at 8am, Peter and Penelope were 1m apart' is nonsense. Moreover, 'At time *t*, …' 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'—see §5.)

We'll see more differences between my proposal and orthodox tense operator views in §§3–5. Namely: my proposal posits cross-temporal facts, refers to times, and holds that present-tensed facts concern a specific time. The views are clearly different. (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 my fundamental facts. I return to this objection in §6.)

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.[8] But, I reply, such a B-theory does not share its conception of time's passing with my A-

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[8] 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 the view 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 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

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 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, some time passing since 8am does not imply that 8am is 'gone'. So my A-theory conceives of time's passing differently than any B-theory.

I shall defend my proposed package from some standard challenges to A-theories. Fundamental facts need not be aspects of current reality (§2); our package can and should posit fundamental cross-temporal relationships (§3); it resolves the difficulty of choosing between 'presentist' and 'eternalist' A-theories (§4); it evades the so-called 'problem of temporary intrinsics' (§5). §6 argues that the notion of 'logical form' can revive the problems addressed in §§3–5, but only by smuggling in assumptions we should reject. I conclude that these standard challenges cast no doubt on my proposed A-theory. The proposal attractively articulates our common sense, pre-relativistic[9] conception of time.

2. Facts about the past are not part of the present

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along the temporal dimension, not along some spatial dimension, and this flows from the natures of space and time. (Maudlin 2007: chapter 1 and pp. 109–110, 130–135; contrast Loewer 2012.)

[9] 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.

A-theorists should hold that the past is gone, but there are facts about what happened. At 8am, 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. A-theorists have struggled to hold on to this common-sense view, but we should hold firm.

Some philosophers hold that 'truth supervenes on being': claims made now are made true or false by the way reality *is*. Given an A-theory, this assumption unattractively bloats current reality. It entails that claims made now 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.[10]

For example, 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* (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 objects of the fundamental facts 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 is subject to the first sort of problem we saw with Bigelow's. Surely sets of propositions stand in Crisp's relation now because of how the world used to be (Sanson & Caplan 2010, Tallant & Ingram 2015). So facts about Crisp's relation are not fundamental, contrary to his proposal.

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[10] Caplan & Sanson (2011) review this literature. The problem is often presented as one for 'presentism', but it arises for my proposal, which rejects presentism (§4).

Some A-theorists accept that 'truth supervenes on being' and bloat the current state of reality[11]; other philosophers conclude that A-theories are false[12]. Surely these responses are mistaken. Truth does not supervene on being. 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.[13] What's needed now is to debunk the appeal of the mistaken assumption. Why would an A-theorist think that truth supervenes on being? I identify two possible culprits.[14]

First, formulating the issues in terms of what's 'real', rather than what exists, 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.[15] Allegedly, there can only be fundamental facts about things that are real. These two claims entail that there can only be fundamental facts about the present. Given that truth supervenes on the fundamental facts, it would follow that truth supervenes on facts about the present—on 'being'.

This argument 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

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[11] Keller (2004) and Cameron (2015 chapters 3–4) consider A-theories according to which 'truth supervenes on being'. Kierland & Monton think 'the shape of the past' is not a matter of 'things and how things are', but is some other kind of 'present aspect of reality' (2007: 486 n. 3, 491–2). I reject this distinction.

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

[13] 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).

[14] Here's a third reason to think that truth supervenes on being. According to some philosophers, A-theories must eschew cross-temporal facts (§3). So current claims could only be made true by current states of affairs. Truth would supervene on being. However, a blanket ban on cross-temporal facts is mistaken (§3), and a specific ban in this case would be absurd.

[15] 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.

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 what exists now versus what did or will exist; and between what exists, did exist, or will exist, versus what's merely fictional. Only the present is 'real', I'd agree, in the sense that only the present exists now. But it is not the case that only the present is 'real', in the sense that anything else is merely fictional. Napoleon is not fictional; in that sense, he is 'real'. There can't be fundamental facts about things that are not 'real', in the sense that the fundamental facts do not concern fictional things. But there can be fundamental facts about things that are not 'real', in the sense of not existing now. So the sense in which only the present is 'real' is not the sense in which the fundamental facts must concern 'real' things. Without equivocating on the word 'real', there is no argument here that truth supervenes on being. The easiest way to avoid getting muddled is to avoid the quicksilver word: my proposal is not framed in terms of what things are 'real'.[16]

A second 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 obtain*s*; *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 a fact is an aspect of current reality. If that were so, then in particular, the facts that make propositions and utterances true would be aspects of current reality. That is, truth would supervene on being.

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

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[16] My proposed fundamental facts do not concern what exists at a time, but those facts are easily derived—see §4.

treat 'it is a fact that p' as equivalent to 'p'.[17] At 8am, Peter and Penelope were 1m apart. I have not changed the subject-matter if I say that this fact obtains. 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 §1 I gave schemata for stating three kinds of fundamental fact, and none of them reify facts. The metaphysically perspicuous statements are things like: 'at 8am, Peter and Penelope were 1m apart'. These are the formulations to keep close.

The current state of reality is not composed of the fundamental facts, but by certain state of affairs. States of affairs that obtain at a time are a matter of things bearing properties and relations at that time; they correspond to fundamental facts of type (2). Thus some fundamental facts concern current states, but many do not. If Peter and Penelope *are now* 5 metres apart, 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.

Facts about the passing of periods of time do not concern states of affairs that obtain at some time. Four hours passed from 8am today until noon. That's a fact. Its being a fact is not a matter of a state of affairs obtaining now and bloating current reality; nor is it a matter of states that obtained at earlier times. It is essentially a cross-temporal matter.

3. Beware of reified talk of cross-temporal relations

Our A-theoretic package postulates fundamental facts about time's passing from one time until another. They are not facts about some moment. They are facts about the period of time between the relevant start and end points; they are cross-temporal facts.[18] The package must

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[17] 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).

[18] 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.

reject a ban on fundamental cross-temporal facts, and so is open to other such facts, which in §1 I labelled type (3).

This is the right way to go. Any sensible A-theory posits cross-temporal facts, because 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 any A-theory is tenable, it is one that allows fundamental cross-temporal facts.[19]

However, orthodoxy bans A-theories from positing cross-temporal facts, on the following sorts of grounds. I separate two arguments, the first being more fundamental, the latter more frequently discussed.[20] (I'll come to a third argument at the end of this section.)

(i) A cross-temporal fact is a matter of two or more objects being related. If some objects are related, then they bear a relation. If some objects bear a relation, then they bear that relation now. Bearing a relation now is a matter of the current state of reality, and is not a cross-temporal matter. So any cross-temporal fact is not a cross-temporal fact at all. That is, there are no cross-temporal facts.

(ii) A cross-temporal fact is a matter of some objects bearing a relation now (for the reasons given in (i)). Some objects can bear a relation now only if they all exist now. So cross-temporal facts only concern objects that exist now. But if there really were cross-temporal facts, they would not be restricted to objects that exist now.[21] For example, my alleged facts about passage concern times that no longer exist; the cross-temporal facts

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[19] De Clercq (2006) argues that there are no fundamental cross-temporal facts, but I am unpersuaded.

[20] Amongst others, the latter argument is discussed by Bigelow (1996: 37), Sider (1999), Markosian (2004), Crisp (2005), Hinchliff (2010), Brogaard (2006), De Clercq (2006), Inman (2012), Ciuni & Torrengo (2013).

[21] One could respond that all objects exist at all times (Williamson 2013). My response is more common-sensical.

required by Galilean spacetime concern spacetime points that are in the past. So there are no cross-temporal facts.

If these arguments are sound, then my proposed conception of passage is mistaken, as well as my insouciant embrace of other cross-temporal facts.

These arguments lose their appeal once we look at relevant examples, that is, of plausibly *fundamental* cross-temporal facts.[22] The arguments lose their appeal in the same place: fundamental cross-temporal facts are not a matter of some objects bearing a relation *now*. Fundamental cross-temporal relationships do not hold at some time or other. 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. The spacetime points the spaceship traversed between 9am and 10am formed an unaccelerated path; that doesn't mean that those points form an unaccelerated path *now*, nor at any other time.[23] Type (1) and (3) facts are not perspicuously represented with an 'at time *t*' clause, unlike type (2) facts.

Thus argument (i) has no force against my proposed A-theory. Cross-temporal facts are not disguised facts about the present. We can say more to say about argument (ii). Some fundamental relations do hold at a time. For example, the relation of being separated by 1m held between Peter were Penelope *at 8am*. If a fundamental relation holds at a time, then its relata

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[22] The examples typically discussed strike me as deeply unlike *fundamental* cross-temporal facts. First: Bill Clinton admires JFK (citations in footnote 20). 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. Causation is a better example, if it assumed to be cross-temporal, but a less controversial case of fundamentality is better.

[23] Whether or not causal facts are fundamental, if they are cross-temporal, then they do not hold at a time. If the cause preceded the effect, then the causing didn't happen at the time of the cause, nor of the effect, nor at any other time.

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. Four hours passed from 8am until noon. That doesn't require 8am to exist now, nor that 8am and noon both exist at the same moment. Certain spacetime points formed an unaccelerated path. That doesn't require those all those points to exist now, nor that they all exist at the same moment.[24]

When we consider appropriate examples, arguments (i) and (ii) have no force. Why would anyone think otherwise? My first suspect is the metaphysically misleading nature of reified talk about relations. There's nothing confusing about the claim that four hours passed from 8am until noon. But if we switch to talk of 8am bearing the four-hours-passed-until relation to noon, things get murky. '8am bears that relation to noon' is a present-tensed locution. Thus it suggests that 8am bears the relation to noon *now*. I've argued that's mistaken. Reified talk of bearing relations does not perspicuously represent the fundamental facts; un-reified predicative expressions do. (I made the analogous point about reified talk of 'facts obtaining' in §2.)

A second 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' (§1). 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 (2) facts, and not cross-temporal facts (Sider 2001: 25–7).[25] Others may conclude that there are no fundamental cross-temporal relationships. I conclude that tense operators cannot capture all the fundamental temporal facts.

Another argument against cross-temporal facts is pressing. Many philosophers think that any fact about an individual logically entails that that thing exists. In particular, the cross-temporal facts I posit allegedly entail that all their relata exist now. As explained in argument (ii), this undermines the appeal of fundamental cross-temporal relationships. Let's now consider whether facts about an individual entail that it exists now.

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[24] §4 explains how to talk about what exists at a time.

[25] Brogaard's (2007) 'span operators' won't help. Truths framed using them are non-fundamental, she says, leaving tense operator views still without fundamental cross-temporal facts.

4. Does this A-theory have objectionable ontological commitments?

One might object that the best A-theory is 'quantificational presentism', an A-theory that holds we should 'ontologically commit' ourselves only to presently existing things, and thus forbids unanalyzed talk of past and future times and objects.[26] I admit that my proposed A-theory is incompatible with quantificational presentism. The proposal talks about past times and objects in three ways. First, it talks about the times 8am and 10am today (for example) to say that two hours passed from the former until the latter. Second, the A-theoretic package talks about the time 8am to say how things were then. Third, it talks about objects that don't exist now, to say how they were or will be. 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 quantificational 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 will come 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.

Quantificational presentism and eternalism present A-theorists with an apparent dilemma. On the one hand, the following argument reinforces the impression that quantificational eternalism is unacceptable. According to sensible A-theories, objects have properties at times, or certain amounts of time ago/hence. 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,

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[26] Amongst others, quantificational presentism is discussed sympathetically by Prior (1967 chapter VIII, 1968, 1998), Bigelow (1996), Zimmerman (1998, 2007), and Markosian (2004), and unsympathetically by Sider (2001, chapter 2), Lewis (2004). Sider (2011: 239–246) argues that the debate between quantificational presentists and eternalists is substantive, on the grounds that the existential quantifier carves nature at the joints; I will 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* my proposed A-theory.

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, quantificational 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).

My proposed A-theory gets us out of this pickle. Theses worthy of the labels 'presentism' and 'eternalism' can be formulated, give my proposed A-theory, but they concern a disjunctive notion of existence that is far from 'carving nature at the joints'. Eternalism is true, but it is a metaphysically unilluminating truth. As I will explain, this unilluminating truth does not land us with puzzlingly ghostly individuals.

I will distinguish two notions of existence: the familiar notion of existence at a time, and a notion of existence *simpliciter*, explained below, which I call ∃-existence. I restrict these two notions of existence to fundamental things, like Phoebe. Each notion of existence comes in a 'predicative' and a 'quantificational' version. 'Predicative' versions of existence are properties had by individuals. For example, Phoebe existed at 8am, and does not exist now. 'Quantificational' versions of existence concern the instantiation of properties. They include the familiar notion of what there is at a time—the sense in which there was an F at 8am and now there isn't—and a sense in which there is an F *simpliciter*, which I write: ∃x(Fx). The predicative and quantificational versions of a notion of existence go hand in hand: what exists is what there is (contra Meinong). For example: Phoebe existed at 8am iff there was something at 8am that was identical to Phoebe. Similarly, Phoebe ∃-exists iff ∃x(x = Phoebe). Thus it makes sense to talk of predicative and quantificational versions of a notion of existence.

I will assume that the truths about what exists—in any sense—are derivative, not fundamental. Consider first predicative existence at a time. I assume there are fundamental facts about what Phoebe was up to at various times, but 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. It is easy to metaphysically explain the facts about predicative existence at a time. 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 [o did not exist at t_2].[27] (I use square brackets simply to indicate scope, not as a term-forming operator. I explicitly restricted the notions of existence I discuss to fundamental things.)

This proposal sounds better with some conceptions of metaphysical explanation than others. I suggested: since (fundamentally) o was F at t_1, 'that explains why it is true that' o existed at t_1.[28] Also plausible: because (fundamentally) o was F at t_1, 'the situation counts as one where' o existed at t_1.[29] Less plausible: o existed at t_1 'in virtue of' o's being F at t_1.[30] That makes it sound like o's existence is metaphysically posterior to being up to o's something, which can't be right. If these considerations allow us to choose between competing conceptions of metaphysical explanation, well hell now, I'd call that progress.

Prima facie, quantificational truths about what there is 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; 2020: 38–9). I take a different view (author MS). We can explain why an existential quantification is false, but only on some conceptions of metaphysical explanation and fundamentality, I argue. Let's not get dragged too far afield. For now, let's just *suppose* that quantificational truths and falsehoods are all non-

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[27] Fine takes a related view, explaining an object's being 'real' as its featuring in fundamental facts (Fine 2009: 171–2).

[28] With this broad conception of metaphysical explanation: Cameron (2010), Sider (2011: 112–124), Williams (2012).

[29] Maybe this glosses Fine's conception of grounding (2001, 2012).

[30] With this broad conception of metaphysical explanation: Schaffer (2009), Rosen (2010), Bennett (2017).

fundamental, and metaphysical explanation is a matter of explaining the truth and falsehood of claims.

As well as truths about what exists and what there is *at a time*, there are truths about what ∃-exists *simpliciter*. I introduce ∃-existence by the following stipulations. Any fundamental fact about some thing, *o*, makes it true that: *o* ∃-exists. Any fundamental fact about some thing, *o*, explains why there is (in this sense) something that is that way. I'll write this as follows: [fundamentally, …*o*___] explains why it is true that ∃x(…x___). These versions of ∃-existence apply to times as well as individuals: [fundamentally, *o* was F at *t*] explains why it is true that *t* ∃-exists, as well as that *o* ∃-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 my proposed A-theory, presentism and eternalism will be theses about what ∃-exists. In the sense of existence those theses concern, if there are fundamental facts about Phoebe then Phoebe 'exists'. So the sense at issue is whether Phoebe ∃-exists. With the notion of existence at a time also at our disposal, we can formulate the theses as follows. Presentism is the view that what ∃-exists must exist now; eternalism denies this. (I am not saying that this is how *any* A-theorist should understand presentism; I am saying that this is the most faithful formulation *given* my proposed A-theory.)

According to my A-theory, eternalism is true and presentism is false. There are fundamental facts about Phoebe, but none about Phoebe's being some way now. So Phoebe ∃-exists but does not exist now. Don't read too much into the fact that Phoebe ∃-exists. ∃-existence cuts across distinctions in the fundamental facts that are crucial to the metaphysics of time. It ignores the times at which an object has fundamental properties, and ignores the tense of that having. ∃-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, but inappropriate for understanding the metaphysics of time.

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.

In sum, my kind of A-theorist can whole-heartedly endorse common-sense claims about what exists now and what existed at past times. While these truths are not fundamental, they carve nature at the temporal joints. Eternalism is true, but it concerns a notion of existence that does not carve nature at the temporal joints.

Earlier we worried that eternalism populates the world with ghostly individuals: things that 'exist' but have no concrete properties now. In my view, this objection lands iff the relevant sense of 'exists' carves at the temporal joints, and it does not. Phoebe ∃-exists because Phoebe was, is, or will be some way at some time or other. That's all that Phoebe's ∃-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 ∃-existence does not make Phoebe ghostly now. By contrast, if Phoebe exists in a joint-carving sense, then it is puzzling how she can lack all concrete properties now.

The presentism–eternalism dilemma for A-theorists gets its teeth from two arguments against eternalism. We've just dealt with the argument that eternalism postulates ghostly individuals. The remaining objection is that eternalism straightforwardly conflicts with common-sense: surely Phoebe does not exist![31] This objection to my proposal conflates our two senses of 'exists'. Common-sense says that Phoebe does not *exist now*, a claim about existence at a time. Eternalism is the esoteric thought that Phoebe ∃-exists, which requires only that there are fundamental facts about Phoebe. The common-sense thought that Phoebe does not exist now does not conflict with eternalism; both claims are true. They appear to conflict only if we conflate the two notions of existence.

A-theorists have conflated existence at a time with ∃-existence, not out of sheer ineptitude, but because they assume that ∃-existence is the joint-carving notion of existence. If there is a metaphysically serious intuition that Phoebe does not exist anymore, it must concern a joint-carving notion of existence. They assume that notion is ∃-existence. So the intuition must

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[31] 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).

be that Phoebe does not ∃-exist, they conclude (incorrectly). The other argument against eternalism also assumes that ∃-existence carves at the joints: that's what implies that if Phoebe ∃-exists then Phoebe is now non-concrete and 'ghostly'. We have found the root of all the trouble.

So that's my diagnosis. ∃-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 ∃-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. Sider and Sullivan claim that the assumption is correct, but it is not. Given my A-theory, ∃-existence cuts across nature's temporal joints, and eternalism is unobjectionable but unilluminating.

Orthodox tense operator views assume (voluntarily) that if there are fundamental facts about Phoebe, then Phoebe exists in the joint-carving sense. That is, they assume that ∃-existence carves at the temporal joints. These views are impaled on the presentism–eternalism dilemma. An unorthodox tense operator view might posit fundamental facts about past individuals, and explain truths about temporary existence and ∃-existence like I have. Such a view refers to past individuals, leaving no objection to talking about past times. The use of tense operators cannot then be motivated on the grounds that we should not refer to past times. So to avoid the presentism–eternalism dilemma, tense operator views must relinquish a standard motivation.

Let's close by rebutting two objections. What does 'Phoebe' refer to, if Phoebe does not exist now (in the joint-carving sense)? That name refers to Phoebe. Referring can be a cross-temporal affair, and the referent need not exist when the act of referring occurs.[32] 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.

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. Answering this worry takes us back to §2. 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 bloating current 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.

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[32] §3 focused on *fundamental* cross-temporal affairs, and referring is not fundamental.

5. 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. This is 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. I rebutted one reason to avoid referring to the time of instantiation in §4: referring to past and future times does not entail that they exist now. Another stock objection to referring to the time of instantiation is the so-called 'problem of temporary intrinsics'.[33] Doesn't my proposal make shape (for example) a relation between a thing and a time, rather than a property as it should be?

No. 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*. A 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 by refusing to take as fundamental claims of the form: at *t*, *o* was F.

David Lewis introduces the problem of temporary intrinsics in the following passages. I interpret them as refusing to take as fundamental 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 is 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)

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[33] 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).

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 tense-operator theorists take this to be definitive of a real A-theory.[34] I am unmoved. We are talking about properties things have *at a time*, even when that time is the present. By contrast, fundamental cross-temporal relationships are not borne at a time (§3). My proposal distinguishes these cases correctly.

6. 'Logical form' and fundamental metaphysics

The problem of temporary intrinsics might be resuscitated using the concept of logical form. What is the logical form of 'at *t*, *o* was F'? Is it: R*ot*, i.e. that *o* and *t* stand in some relationship? If so, then I have replaced intrinsic properties with relations—relations to times. The problem of ontological commitment to past object and times is also resurrected. If the logical form of 'at *t*, *o* was F' is: R*ot*, 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: my facts about passage would entail that the relevant times 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

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

property at a time, and two objects being related *simpliciter*. This distinction matters, and there are fundamental facts of the second kind too: past periods of time passed *simpliciter*, not at a particular time (§3). 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 (§4). 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*ot*], 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 ∃-existence? That [at 8am, Phoebe was emitted] also makes it true that Phoebe ∃-exists. The abstract generalization is that any fundamental fact about a thing, *o*, makes it true that *o* ∃-exists. That is, any fundamental fact of the form [...*o*___] makes it true that *o* ∃-exists. But no-one thinks the logical form of 'at 8am, Phoebe was emitted' is: [...Phoebe___]. So again, there is no argument here for metaphysically privileging 'logical form'.

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 my proposal. 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 denying Logical Fundamentalism. My proposal is more plausible. 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 (§4).

Quantificational truths concerning ∃ and its dual, ∀, are non-fundamental. While ∃ and ∀ are good for generalizing across past, present, and future, they thereby cut across nature's temporal joints. The account in §4 is attractive, but it supposes we can explain false existential and true universal generalizations, and I did not show how to do so. In think this obligation can be met (author MS). If so, Sider's argument for Logical Fundamentalism fails.

7. Conclusion

I've proposed an A-theory that takes as fundamental facts like: [4 hours passed from 8am on day D until noon], [at 8am on day D, Peter and Penelope were 1m apart], and some more cross-temporal facts. This A-theory attractively articulates our pre-relativistic conception of time. It is an overlooked option that deserves to be taken seriously. Philosophical arguments have led A-theorists away from this natural view, but those arguments are fallacious.[35]

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