

Presentism and eternalism

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Presentists say that only the present is real. Eternalists say that other times are equally real. Equivalently, presentists say that the only real (temporally locatable) things that there are, are ones that presently exist. Eternalists say that there are DD(temporally locatable)DD things existent at other times that are equally real. Since to be real is just to be, the presentist's position is just that everything (temporally locatable) that there is exists now. The eternalist's position is that this is not so. Since 'everything that there is' just means 'everything', the presentist's position is just that everything (temporally locatable) exists now. The eternalist's position is the denial of this claim -- that there are (temporally locatable) things that do not presently exist, i.e. that there are more Itemporally locatableII things than there are at present. But it is trivially true that everything DD(temporally locatable)DD *that exists now* exists now, so the eternalist will not deny it. And it is obviously false that there never have been and never will be things other than those that exist now, so the presentist will not affirm it. So exactly what is in contention between the presentist and the eternalist?

The debate between the actualist and the possibilist is analogous, as frequently noted (Sider 2001). Actualists say that only the actual world is real. Possibilists say that other possible worlds are equally real. Equivalently, actualists say that the only real things that there are are actual existents. Possibilists say that there are things in other possible worlds that are equally real. Since to be real is just to be, the actualist's position is just that everything (possible) that there is actually exists. The possibilist's position is that this is not so. Since 'everything that there is' just means 'everything' the actualist's

position is just that everything (possible) is actual. The possibilist's position is the denial of this claim – that there are possible things that do not actually exist, i.e. that there are more Π possible Π things than there actually are. But it is trivially true that everything $\Delta\Delta$ (possible) $\Delta\Delta$ that *actually exists* is actual, so the possibilist will not deny it. And it is obviously false that there could not have been things other than those there actually are, so the actualist will not affirm it. So exactly what is in contention between the actualist and the possibilist?

I wish to suggest that we pursue the analogy between these debates more strictly than is usual. Attending to the clarification of the latter debate which Lewis gives, I offer a way of characterising what is at the core of the dispute between presentists and eternalists that is immune to worries often raised about the substantiality of their debate (Crisp 2004). According to Lewis what is neither trivially true nor obviously false is that everything (*simpliciter*) which is possible is actual. Likewise, I suggest, it is neither trivially true nor obviously false that everything (*simpliciter*) which is temporally locatable is presently existent.

In response to the worries about the substantiality of the debate between presentists and eternalists Sider (2001: 15) argues that there is a genuine disagreement between the two over *set* existence. The eternalist will affirm – on the basis of his commonplace historical knowledge that there are now computers, and were once dinosaurs, although they never coexisted – the existence of a set containing a dinosaur and a computer, whilst the presentist will deny that this is entailed (though he may, if he has weird enough historical beliefs, e.g., that the Loch Ness monster now exists and is a dinosaur or that the dinosaurs were wiped out by an advanced computer-using alien

civilization, accept that in fact there is now or was once such a set). This does, I believe,ⁱ identify a locus of disagreement, but it does not, I think, locate the core of the dispute. Consider the modal case. Define a ‘lonely’ man/woman as a man/woman without any female/male worldmate, i.e., on Lewis’s account not (analogically) spatiotemporally related to any woman/man. The Lewisian possibilist will affirm – on the basis of his commonplace modal knowledge that there could have been a lonely man, and there could have been a lonely woman, but there could not have been both a lonely man and a lonely woman – the existence of a set containing a lonely man and a lonely woman, whilst his actualist opponent will deny the entailment (though he may, if he has weird enough modal beliefs, e.g., that contradictions are or can be true, accept that there actually is or could have been such a set). This is a genuine disagreement between the two. But this disagreement between the two about *set* existence is hardly at the core of the debate between Lewis and his opponent. This is whether the possible but non-actual existence of, e.g., talking donkeys, requires the existence of *concrete* objects not spatiotemporally related to us. From the philosophical contention that this is so, together with the common-sense platitude that there actually are not, but might have been, talking donkeys, the Lewisian infers the existence of objects spatiotemporally unrelated to us and hence a plurality of worlds.

My suggestion below is that the core of the eternalist/presentist debate must be analogously located.

To a first approximation (see below for refinement)ⁱⁱ actualism can be characterized as follows.

There is a slogan:

1Act) ‘Everything is actual’ (or ‘The only things that exist are things that actually exist’ or ‘Only actual things exist’, or ‘Only the actual exists’).

There is anti-Lewisian actualism:

2Act) Everything concreteⁱⁱⁱ is spatiotemporally related to me.

And there is (what I will call) Megarian actualism:

3Act) Nothing is possibly the case that is not actually the case.

Possibilism can be characterized as follows.

There is a slogan:

1Poss) ‘Not everything is actual’ (or ‘It is not that case that only actual things exist’, ‘It is not the case that only the actual exists’).

There is Lewisian possibilism (genuine modal realism):

2Poss) It is not the case that everything concrete is spatiotemporally related to me (for example, there are (talking) donkeys that are not).

And there is anti-Megarian possibilism:

3Poss) Some things that are not actually the case are possibly the case.

Megarian actualism is obviously false and anti-Megarian possibilism obviously true. But the debate between anti-Lewisian actualists (i.e., all philosophers of modality apart from Lewis himself, including both the ersatzers about possible worlds and those who reject possible world talk altogether) and the Lewisian possibilist (i.e., Lewis himself) is a substantive one.

However, refinement is necessary here, as noted above. An opponent of Lewis may be agnostic about the existence of concrete objects not spatiotemporally related to him (he may be willing to learn from the physicists about many worlds), and a Lewisian

with a sufficiently restricted view of what is possible may accept that there are no concrete objects not spatiotemporally related to him – for his *analysis* of modality does not commit him to a plurality of worlds. But, as noted, Lewis’s philosophically contentious claim is that the possible but non-actual existence of, e.g., talking donkeys, *requires* the existence of concrete objects not spatiotemporally related to us (which, together with the uncontentious claim that talking donkeys are (merely) possible, entails (2Poss)). It is this contentious philosophical claim which is best labelled ‘Lewisean possibilism’, and it is the denial of this contentious claim, rather than the flat-out denial of (2Poss), which is better labelled ‘anti-Lewisean actualism’ (of course, most actual anti-Lewisean actualists also deny (2Poss), and for our purposes it is this joint denial which is *best* so labelled). Nonetheless, because Lewis has given a *non-modal* characterization of what is at issue between the actualist and the possibilist, i.e., the merely possible, namely ‘that which is in no way spatiotemporally related to me’ (equivalently: because he has given a non-modal characterization of the worldmate relation),^{iv} it is a substantive question whether anything answers to this characterization, or has to answer to it in order for assertions of mere possibility to be correct.^v (Another way of seeing the significance of Lewis’s cashing out of the distinction between the actual and the merely possible in non-modal terms is to see how it enables him to avoid the charge that his modal realism consists in the denial of an analytic truth – that everything there is is actual (Lewis 1986: 99-101). Commonsense has it both that all donkeys (i.e., all the donkeys that there are) are actual concrete existents and that all actual concrete existents are spatiotemporally related to us. But both these opinions cannot be analytic, since it is not analytic that all donkeys are spatiotemporally related to us. Thus by denying this Lewis can distinguish himself from

his opponents without descending into analytic falsehood. *Mutatis mutandis* the non-temporal cashing out of the notion of the present given below eliminates the worry that eternalism is just an analytic falsehood.)^{vi}

We can approach the debate between the presentist and the eternalist with this framework in mind and give characterizations of what I shall call anti-*Lewisean* presentism and *Lewisean* eternalism. (Of course, the *Lewisean* eternalist has more work to do than the Lewisean possibilist, since the merely possible does not divide into two realms, but the eternalist has to explain the divide between present and future; whether he can do so in wholly non-temporal terms or needs to appeal to an irreducibly temporal B relation (*later than* or its converse) is another question. In fact, we need to distinguish between the mere denial of anti-*Lewisean* presentism, which is a position a ‘growing block’ theorist could espouse, and ‘*Lewisean* eternalism proper, which accords equal reality to past and future. But that distinction is not my topic, so I shall continue to write of *Lewisean* eternalism where what I mean is strictly only the denial of anti-*Lewisean* presentism.)

Consider first presentism.

There is a slogan:

1Pres) ‘Everything is present’ (or ‘The only things that exist are the things that exist at present’ or ‘Only present things exist’ or ‘Only the present exists’)

There is anti-*Lewisean* presentism:

2Pres) Everything concrete^{vii} is spatially related to me^{viii}

And there is Megarian presentism:

3Pres) Nothing is ever the case that is not now the case

Next consider eternalism.

There is a slogan:

1Eter) ‘Not everything is present’ (or ‘It is not the case that only present things exist’ or ‘It is not case that only the present exists’)

There is *Lewisean* eternalism:

2Eter) It is not the case that everything concrete is spatially related to me (for example, there are dinosaurs that aren’t)^{ix}

And there is anti-Megarian eternalism:

3Eter) Some things that are not now the case are sometime the case.

Megarian presentism is obviously false and anti-Megarian eternalism obviously true. (Perhaps there are possible worlds consisting of a single moment, in which I have (or my counterpart has) no past or future, but that is not true of this world).^x But the debate between the anti-*Lewisean* presentist and the *Lewisean* eternalist is a substantive one – at least, it is *if the debate between the anti-Lewisean actualist and the Lewisean possibilist is*. (Sometimes the focus of the worry about the substantiality of the debate between the presentist and the eternalist is on the question whether there is a unitary notion of existence, distinct from ‘exists now’ and ‘exists now, or did exist or will exist’, in terms of which their disagreement about the existence *simpliciter* of, e.g., dinosaurs – whether $\exists xDx$ – can be stated, rather than on the meaning of ‘present’. This focus is encouraged by the parenthetical versions of the opposing slogans given above – which is one reason why the original versions using just the universal quantifier are preferable. *Mutatis mutandis* one might equally well worry, even *given* Lewis’s explication of the notion of actuality, whether there is a unitary notion of existence,

distinct from ‘actually exists’ and ‘actually exists or might have existed’, in terms of which the disagreement between the Lewisian possibilist and the anti-Lewisian actualist over the existence *simpliciter* of talking donkeys – whether $\exists xTDx$ – can be stated. Again, this worry might be encouraged by the parenthetical versions of the opposing slogans.^{xi} But I take it that not many people, given Lewis’s non-modal explication of the actual as that which is not spatiotemporally related to us, will regard this worry as a good reason for denying the substantiality of the latter debate, or retreating from their incredulous rejection of genuine modal realism.)

Of course, just as in the modal case, refinement and relabelling is necessary here. As we saw, an opponent of Lewisian possibilism may be agnostic about the existence of talking donkeys not spatiotemporally related to him. But he will say, the possible, though non-actual, existence of talking donkeys does not entail the existence of such spatiotemporally unrelated talking donkeys, since the possible existence of talking donkeys does not entail the existence of talking donkeys. Similarly, an opponent of *Lewisian* eternalism may be agnostic about whether there are any dinosaurs not spatially related to him. But, he will say, the past-or-future, though non-present, existence of dinosaurs does not entail the existence of such spatially unrelated dinosaurs, since the past-or-future existence of dinosaurs does not entail the existence of dinosaurs. The eternalist will say it does (for his disagreement with the presentist is not just about what exists but about the nature of temporality). Thus he faces a compulsory question: since he denies that ‘presently there are dinosaurs’ is entailed, he must explain what the latter adds to the unqualified ‘there are dinosaurs’. *Lewis* explains this in wholly non-temporal terms. Because he does so, because he gives a non-temporal characterization of the non-

present, namely ‘that which is in no way spatially related to me’ (equivalently: because he gives a non-temporal characterization of simultaneity), it is a substantive question whether anything answers to this characterization or has to answer to it for assertions of merely past or future existence to be correct.^{xii}

It should be noted that, of course, just as the Lewisian possibilist (along with the actualist), consistently with his denial of spatiotemporal relations across worlds, can endorse the modal proposition ‘There might have been a talking donkey right *here and now* where I actually am’^{xiii}, so the *Lewisian* eternalist, along with the presentist, consistently with his denial of spatial relations across times, can endorse the tensed proposition ‘A million years ago there were two dinosaurs fighting right *here* where I presently am’.^{xiv} Similarly, of course, though the *Lewisian* eternalist cannot maintain that causally related events must be spatially related, e.g., spatially contiguous, he must allow for such common-sense truths as that the (past) short-circuit caused the (present) fire. So, of course, must the presentist. So, if necessary, the eternalist can borrow the presentist’s account of this truth. Alternatively, he can offer an account of causation as a genuine (non-spatial) relation between events (following Hume, for whom ‘the great part of beings are nowhere’^{xv}).

In order to characterize what is at issue between the presentist and eternalist in non-temporal terms I have had *Lewis* appeal to the notion of spatial relatedness (*‘Lewisian* eternalism so understood may be thought of as Galilean eternalism). This seems the obvious way to pursue the analogy to the actualist/possibilist debate between opponents and defenders of Lewisian genuine modal realism.^{xvi} But one need not pursue the analogy in this way. Another possibility is to substitute the notion of causal non-

connectibility (topological simultaneity) for the notion of spatial relatedness in the account. This yields a form of *Lewisean* eternalism we may think of as Einsteinian eternalism.^{xvii} (To avoid the consequence that non-actual possible worlds count as present we can include spatiotemporal relatedness to us as a necessary condition of presentness.) The crucial point is that pursuing the analogy *strictly*, that is, cashing out the notion of the present in non-temporal terms in the way that Lewis cashes out the notion of the actual in non-modal terms, gives clear sense to a controversy which otherwise seems deeply obscure.

Of course, anti-*Lewisean* presentism only becomes a definite thesis, rather than the mere form of a thesis, once *some* non-temporal meaning for ‘present’ is chosen, just as the denial of Lewisean possibilism is only a definite thesis because Lewis has said, in non-modal terms, what he means by ‘actual’. But my contentions are (i) that *any* presentist must maintain a conjunctive thesis, analogous to anti-Lewisean actualism, of the form: ‘(a) everything which is *R*-related to anything is *R*-related to me and (b) the truth of past and future tense statements is consistent with (a)’ – where ‘*R*’ is explained in *non-temporal* terms and ‘me’ is taken to denote an entity all of whose parts are *R*-related,^{xviii} and (ii) when defending (b) he may appeal to resources analogous to those employed by the opponents of genuine modal realism – e.g., ersatzism about times or primitivism about tense. This is not to say, though, that all the issues are analogous. For example, what is presently the case seems not to fix what was or will be the case or, indeed, even that there *was* a past or *will be* a future (Sider 2001: 37). So the presentist, unlike the eternalist – for whom the past is, in a not merely metaphorical sense, ‘another country’ – needs to explain why it does not, or how, contrary to first appearance, it does.

By contrast, what is actual does seem to fix what is possible, so there is no corresponding demand on the actualist to save the appearances which the possibilist does not face.

Again, we do not have names or definite descriptions for other possible worlds or merely possible objects, but we do have names and definite descriptions for other times and objects that do not exist now – ‘the twentieth century’, ‘five seconds ago’, ‘Bertrand Russell’, ‘the first dog ever born at sea’, ‘the man with the biggest nose in the history of France’, ‘the greatest philosopher living a century ago’. The presentist must account for these. Nor, where there are corresponding battles in the two debates, need it be that they must have the same outcome in the two cases.

In sum: I offer the way of characterising anti-*Lewisian* presentism and *Lewisian* eternalism given above as a way of homing in on a substantive issue, strictly analogous to the issue between actualists and possibilists if we conceive the latter debate in *Lewisian* terms.

ⁱ Matters are not straightforward, as Sider acknowledges. Most obviously, because neither the eternalist nor the presentist need accept the existence of sets. But Sider argues, even if they do not he has still identified a locus of disagreement between them since the eternalist will assent to, and the presentist will dissent from, the *conditional* statement ‘If there were sets, there would/would sometime be a set containing a computer and a dinosaur’.

ⁱⁱ For those who cannot wait: refined actualism is the thesis that (2Act) below is both true and consistent with the possibility of concrete things other than those there actually are.

ⁱⁱⁱ Here ‘concrete’ may be understood as ‘bearing spatiotemporal relations’.

^{iv} Lewis considers other characterizations; what is crucial for him is just that he can characterize the worldmate relation in non-modal terms.

^v One can be a possibilist without being a *Lewisian* possibilist. It suffices to hold that, for some reading of ‘F’ as a predicate of concrete things, the possible but non-actual existence of Fs entails the existence of

non-actual entities which are possible Fs. Lewis just adds that the possible Fs are Fs. But my claim is that the presentist/eternalist debate is illuminatingly compared to that between the anti-Lewisian actualist and the Lewisian possibilist. It is consistent with this that Lewis's development of possibilism is just one variety, and indeed, that it is a wholly wrong-headed one (perhaps resulting from seeing too great an analogy between the modal and temporal cases). Of course the non-Lewisian possibilist must also say in what the non-actuality of the non-actual entities which are possible Fs consists. (Why are the non-actual entities which are possible talking donkeys non-actual? Not because they are not talking donkeys – nor am I.) He may do so, for example, by saying that they lack, contingently, spatio-temporal properties (rather than, as Lewis does, spatio-temporal *relatedness* to us). This answer also satisfies the desideratum that the notion of the non-actual is explained in non-modal terms.

^{vi} A kind of pre-Lewisian modal realism can be envisaged which maintains that possible worlds are maximal summations of concrete entities linked by the worldmate relation, and that 'actual' is an indexical denoting us and all our worldmates, but does not include any non-modal clarification of the worldmate relation, and, specifically does not give any non-modal necessary condition of things being parts of the same world. A defender of this pre-Lewisian position would still be in disagreement with common-sense, and would not be a merely ersatz modal realist, since he would insist that the merely possible existence of talking donkeys entailed the existence of talking donkeys, and so would accept the existence of talking donkeys. But he would not have the resources the real Lewis has to defend himself against the charge of embracing an analytic falsehood, that is, to explain why it is *not* merely analytic that all donkeys are our worldmates (namely, because it is not merely analytic that all donkeys are spatiotemporally related to us and spatiotemporal relatedness is a necessary condition of belonging to the same world) and so not merely contradictory to conjoin the claim that there are talking donkeys with the claim that there are not *actually* any talking donkeys. This pre-Lewisian modal realism would be, as it were, merely the *form* of a genuine modal realism. *Mutatis mutandis*, eternalism without any non-temporal cashing out of simultaneity or the notion of the present, of the kind considered below, is merely the form of a genuine eternalism, standing to what I call immediately below *Lewisian* eternalism as pre-Lewisian modal realism stands to genuine modal realism.

^{vii} Here 'concrete' may be understood as 'bearing spatial relations'

^{viii} To avoid having anti-**Lewisean** presentism entail anti-Lewisean actualism (though we might want this entailment) we can say instead ‘Everything concrete that is spatiotemporally related to me is spatially related to me’ or neutrally ‘Everything concrete that is actual is spatially related to me’. The definition of eternalism will then need to be similarly revised.

^{ix} Just as, in the statement of Lewisean possibilism, the reference of ‘I’ must be taken to be to a ‘world bound’ (or what Lewis himself (1986: 214) calls a ‘possible’) individual, i.e., one all of whose parts are spatiotemporally related, so, in the statement of **Lewisean** eternalism, the reference of ‘I’ must be taken to be to a ‘temporally bound’ individual, i.e., one all of whose parts are spatially related. The notion of parthood employed here in both explications is that of classical mereology.

^x I note here the reason for the scare (star) quotes round **Lewisean**: Lewis himself appears to conceive presentism, at least in *On The Plurality of Worlds*, as the obviously false thesis I have called Megarian presentism (1986: 204). It is his second discussed solution to the problem of temporary intrinsics, which he dismisses as incredible, since no man believes he has no past. (There is another interpretation of Lewis’s discussion here, viz., that he *is* thinking of presentism as analogous to anti-Lewisean actualism, but, unlike anti-Lewisean actualism itself, does not consider it even worthy of refutation. If this interpretation is correct I can drop the scare quotes.)

^{xi} Sider (2006: 75) sets up the sceptic’s case (which he rejects) for the merely verbal character of the debate between the presentist and eternalist as follows: ‘Even the presentist agrees that there once existed dinosaurs. So if “exist” in “there exist dinosaurs” means “once existed” everyone agrees that it is true. And even the eternalist agrees that there do not now exist dinosaurs. So if “exist” in “there exist dinosaurs” means “exist now”, then everyone agrees that it is false. Under neither of these two meanings for “exist” can there be controversy... What else could “exist” mean?’ *Mutatis mutandis* a sceptic about the possibilist/actualist debate could argue as follows: ‘Even the actualist agrees that that there might have existed talking donkeys. So if “exist” in “there exist talking donkeys” means “might have existed” then everyone agrees it is true. And even the possibilist agrees that there do not actually exist talking donkeys. So if “exist” means “actually exist” everyone agrees that it is false. Under neither of these meaning for “exist” can there be controversy... What else could “exist” mean?’ In his (2001: 16) Sider endorses the contention I have been emphasizing – that the eternalist/presentist debate is substantive if the

possibilist/actualist one is: ‘the idea that presentists and eternalists do not genuinely disagree ... leads to denying that ... actualists and possibilists genuinely disagree.’

^{xii} Can one be an eternalist without being a *Lewisean* eternalist? Does it suffice to be an eternalist to hold that, for some reading of ‘F’ as a predicate of concrete things, the past-or-future but non-present existence of Fs entails the existence of non-present entities which are past-or-future Fs – without going on to add that these past-or-future Fs are Fs? This does not seem to me to be in accord with the spirit of eternalism. But someone who nonetheless takes this line still faces the question in what the non-presentness of the non-present entities which are past but not present Fs consists. Why are the non-present entities which are past dinosaurs non-present? He may answer this question in non-temporal terms (analogously to the way the non-Lewisean possibilist answers the corresponding question about the non-actual in note. v) by saying that the non-present is that which lacks, not spatial *relatedness* to us, but spatiality *simpliciter*.

^{xiii} As Lewis says: ‘things that are parts of two worlds may be simultaneous or not, they may be in the same or different towns, they may be near or far from one another, in very natural counterpart theoretic senses. But these are not genuine spatiotemporal relations across worlds’ (1986: 71).

^{xiv} It is easier for the eternalist than the possibilist since he can identify ordinary individuals – such as planets, cities and cars – with perdurants. So he can say that two temporally separated events happened in the same place because, for example, they occurred in the back seat of a certain car (whilst acknowledging an equally good sense in which they happened hundreds of miles apart because one happened in Manchester and the other in London). For the reasons Lewis gives, the possibilist cannot identify ordinary individuals with trans-world individuals even though, of course, he does not deny the existence of the latter.

^{xv} ‘I deliver a maxim, which is condemn'd by several metaphysicians, and is esteem'd contrary to the most certain principles of human reason. This maxim is that an object may exist, and yet be no where: and I assert, that this is not only possible, but that the greatest part of beings do and must exist after this manner. An object maybe said to be no where, when its parts are not so situated with respect to each other, as to form any figure or quantity; nor the whole with respect to other bodies so as to answer to our notions of contiguity or distance. Now this is evidently the case with all our perceptions and objects, except those of the sight and feeling.’ (1978: 235-236)

^{xvi} Though given special relativity, of course, on this proposal the present shrinks to a space-time point. On a Newtonian conception of substantial space, complete with the notion of absolute rest, on the other hand, it expands to include everything. In fact, it is hard to see how an eternalist who endorses the Newtonian conception of absolute rest can give any account of the present without employing or presupposing temporal concepts, that is to say, it is hard to see how he can explain *in any non-temporal* terms what ‘there are dinosaurs existing now’ adds to ‘there are dinosaurs’ (I assume that causal (non-)connectibility by a *finitely* fast signal is an implicitly temporal notion).

^{xvii} Given special relativity this results in branching within times (cf. Lewis on branching within, versus branching of, worlds 1986: 209: in a world that branches there are events a , b and c such that there is no space-time interval between b and c , but there is an interval between a and b and one between a and c , each of b and c may be in the absolute future of a , but not timelike, spacelike or lightlike separate from each other, so for an observer at a there is no such thing as *the* future).

^{xviii} Otherwise the debate between the presentist and eternalist remains at the level of the pre-Lewisian (note vi) debate between actualist and possibilist about the existence of donkeys in other worlds, when no non-modal characterisation of worlds or the worldmate relation is available.

References

Crisp, T. (2004) On Presentism and Triviality. In D. Zimmerman (ed.) *Oxford Studies in Metaphysics*, Volume 1. Oxford: Oxford University Press

Hume, D. (1978) *A Treatise of Human Nature*. Ed. L.A. Selby Bigge. 2nd Edition revised by P.H. Nidditch. Oxford: Clarendon Press

Lewis, D. (1986). *On the Plurality of Worlds*. Oxford: Basil Blackwell.

Sider, T. (2001) *Four Dimensionalism*. Oxford: Oxford University Press.

Sider, T. (2006) Quantifiers and temporal ontology. *Mind* 115: 75-97..