

Inconsistency in the A-Theory

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Received: 17 March 2010 / Accepted: 14 May 2010

Abstract This paper presents a new argument against A-theories of time. A-theorists hold that there is an objective now (present moment) and an objective flow of time, the latter constituted by the movement of the objective now through time. A-theorists therefore want to draw different pictures of reality—showing the objective now in different positions—depending upon the time at which the picture is drawn. In this paper it is argued that the times at which the different pictures are drawn may be taken to be normal times or hypertimes. If they are normal times then the A-theory is inconsistent, or else collapses to the B-theory—and appealing to primitive tense operators will not help A-theorists avoid this conclusion. If the times are hypertimes then the A-theory is consistent, but deeply problematic none the less.

Keywords time · A-theory · B-theory · flow · passage · becoming · McTaggart

Introduction

McTaggart (1908) argued along the following lines that time is unreal:¹

1. Time exists only if there is genuine change.
2. The B-theory cannot accommodate genuine change: there is genuine change only if the A-theory is correct.
3. The A-theory involves a contradiction and therefore is not correct.
4. Therefore there is no genuine change.
5. Therefore time does not exist.

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¹ A version of the argument also appears in McTaggart (1927).

McTaggart's argument has been discussed extensively in the literature and interest in it has—if anything—increased over the years.² Nevertheless, the case for premise 3 has never been made as forcefully as is possible. In this paper I therefore try to make the case against the A-theory watertight, by offering a new demonstration of the claim that this theory involves a contradiction. More precisely, I show that the A-theory in its standard form—that is, without hypertime—is inconsistent. I then argue that while the A-theory can be rendered consistent by positing hypertime, the resulting view is subject to devastating objections.

I happen to believe that both McTaggart's conclusion and his step 2—and probably step 1 as well—are incorrect. Those, however, are topics for other occasions: my sole concern in this paper is to argue against the A-theory.

§1 deals with preliminaries—including an explanation of the terms 'A-theory' and 'B-theory'.³ The argument against the A-theory is then made in §2.

1 Two metaphysical questions

In this section I review two metaphysical questions, and identify several positions on the metaphysics of time according to the answers each position gives to these questions.

1.1 Are the past, present and future equally real?

Eternalism is the view that past and future times, objects and events are just as real as the present time and present events and objects. Eternalism may be compared with the common-sense view about places. Consider some objects in your immediate vicinity and some distant objects, and ask yourself: are the objects around you more real than the distant objects? The common-sense answer is No. Although one cannot see or touch distant objects in the way one can nearby ones, this just means that nearby objects are *epistemically* privileged—they are easier to know about—not that they are *metaphysically* privileged. Distant objects are just as real as nearby ones; not only the objects around here exist—distant objects exist too. Eternalism may also be compared with the common-sense view about persons. Although you are epistemically special (to yourself)—you can experience what it is like to be you but not what it is like to be someone else—you are not metaphysically special. Other persons are just as real as yourself.

Nowism is the view that only the present time and present events and objects exist. Nowism may be compared with solipsism: the view (which contrasts with the common-sense view about persons considered in the previous paragraph) that only oneself exists, that other persons are not real.⁴ Or to take a less far-fetched posi-

² For example, the latest issue of *Philosophia* (vol. 38, no. 2, June 2010) is devoted to papers on McTaggart's argument.

³ The presentation of McTaggart's argument given above reflects the terminology to be explained in §1, rather than conforming precisely to McTaggart's own wording.

⁴ This is a strong version of solipsism. More moderate views also go under the name—for example the view defended by Hare (2009).

tion: nowism may be compared with the widespread view that only the actual world exists—that other possible worlds do not differ from the actual world simply in terms of our epistemic access to them, but are *metaphysically* less privileged than the actual world.

Now-and-then-ism is the view that the past and present exist but the future does not. This view is intermediate between eternalism and nowism; an analogue in the case of the metaphysics of persons would be *me-and-my-friends-ism*, which is intermediate between everyoneism (as we may label the common-sense view considered above) and solipsism in terms of the number of persons it countenances.

There are of course many other possible answers to the question of which times are real—for example futurism, 1933-ism, and so on. The three views just outlined are however the main ones that have been seriously defended in the literature.

1.2 Is there an objective flow or passage of time, and an objective now?

One of the most striking features of our experience of time is that time seems to *pass*. Even if one sits still and does nothing, one seems to be aware of time passing: of events approaching from the future (one anticipates them), being present (one experiences them) and then receding further and further into the past (one remembers them). Some events are occurring *now*, others *will* occur (they are future) and others *have* occurred (they are past). Apart from this apparent flow of time, another striking feature of our experience of time is that there is something special about *now*: one seems always to be stuck in it. That is, one can only (directly) experience the present moment, not any past or future time. These two features of our experience of time are linked: the now seems to move forward relentlessly, dragging us with it. We can experience only the now—but the now is always moving; hence we experience time as flowing inexorably.

Our second metaphysical question is whether this flow of time and this division of events into past (before now), present (now) and future (after now) are *objective* features of reality (as opposed to mere features of our experience)? The *A-theory* answers Yes: there is an objective flow of time and an objective now. Furthermore, the two are linked: the objective flow of time arises from the movement, through time, of the objective now (from the past towards the future). The *B-theory* answers No: there is no objective flow of time and no objective now. Of course the B-theory accepts that we *experience* now as special, and time as flowing; the theory simply denies that what is going on here is that we are detecting objective features of reality in a way that corresponds transparently to how those features are in themselves.

1.3 Positions on the metaphysics of time

We are now in a position to define four of the major views on the metaphysics of time.⁵ Each view represents a combination of answers to our two metaphysical questions:⁶

- The *block universe* view: eternalism + B-theory
- The *moving spotlight* view: eternalism + A-theory
- The *presentist* view: nowism + A-theory
- The *growing block* view: now-and-then-ism + A-theory

In order to get a feel for the differences between these views, imagine that we ask the proponents of each view, at a given time, to draw a picture of the sum total of reality.⁷ The proponent of the block universe view will always draw the same picture, no matter when we ask for it (Figure 1).⁸ This picture consists in a four-dimensional

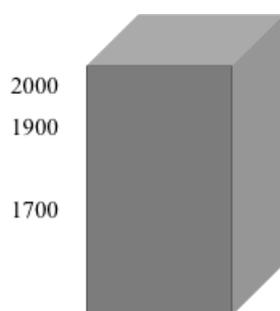


Fig. 1 The block universe view

‘block’, representing the spread of events throughout all space and time.⁹ The situation is analogous to one in which we ask persons living in different countries to

⁵ These four views are not the only ones that have been seriously defended in the literature; for example, McCall (1976) defends a version of the A-theory which involves branching time. Note however that the arguments against the A-theory to be presented below apply to *any* version of the A-theory, not just to these four examples.

⁶ Terminology and its usage varies across the literature—hence the need to define terms here. For example, Sider (2001) uses the term ‘B-theory’ for what I call the ‘block universe view’; Zimmerman (2005) uses the term ‘B-theory’ in a sense closer to—although not exactly the same as—the sense in which I defined it above; Smith (1994) uses the term ‘tenseless theory of time’ (which he opposes to ‘tensed theory of time’) for a view much like the block universe view as defined in the present paper—but without presenting this view as a combination of two separate aspects (i.e. eternalism and B-theory, in the terms of the present paper); while Maudlin (2007) writes that he is “one of those unusual defenders of the block universe who does not deny that there is any objective flow of time” (p.109), but is not an A-theorist in my sense (see e.g. p.126, n.11).

⁷ More precisely, a picture of the sum total of the actual world—that is, we set aside questions of whether non-actual possible worlds exist.

⁸ What I mean is that *in principle* she will always draw the same picture—that is, setting aside any changes merely in her *knowledge* of what happens when and where.

⁹ In Figure 1, the vertical axis is the time axis and only two spatial dimensions are shown.

draw pictures of the world. There are two aspects to the analogy. First, the *eternalism* aspect. No matter where in the world he is located, a person will produce the same map.¹⁰ Likewise, whenever the block universe theorist is asked for her picture of the sum total of reality, she will draw the same thing. Second, the *B-theory* aspect. A map of the world does not require a marker showing where *here* is. ‘Here’ is not an objective feature of reality—a particular point in the world which remains as and where it is, regardless of who is talking about it. Rather, here is simply wherever one is.¹¹ Likewise, the block universe theorist’s picture does not show a particular now-time. On this view, ‘now’ is not an objective point in time, the same for all observers. Rather, now is simply whenever one is.¹²

In contrast, proponents of the other views—the views which incorporate the A-theory—will want to draw different pictures of the sum total of reality, according to when we ask them for the picture.¹³

The proponent of the moving spotlight view agrees with the block universe theorist when it comes to the first metaphysical question (i.e. both subscribe to eternalism) but differs over the answer to the second question: she holds that there *is* an objective now, and an objective flow of time—the latter constituted by the movement of the objective now from the past towards the future. Thus, she draws different pictures of reality at different times (Figure 2). Each picture consists in a four-dimensional block, like the block universe theorist’s picture. For the moving spotlight theorist, however, the block is subtly different at different times: the objective now changes its position. To put it metaphorically, different cross-sections of the block are ‘illuminated by the spotlight of nowness’ at different times; or to vary the metaphor, at different times, different points in the block are being ‘passed by the crest of the wave of time’.

The presentist, in contrast with both views mentioned so far, never draws a four-dimensional block: she always draws a three-dimensional picture (Figure 3).¹⁴ The three-dimensional picture she draws at time *t* is precisely that cross-section of the four-dimensional block which the moving spotlight theorist shows, at *t*, as illuminated by the light of now.¹⁵

¹⁰ I assume that our persons subscribe to everywhereism (as we may label the common-sense view mentioned in §1.1).

¹¹ Of course some globes and maps do have a pointer saying ‘you are here’. This is quite compatible with the view just outlined, according to which there is no *objective* here-point (i.e. one here-point which is the same for all observers)—for in these cases, ‘here’ just indicates the point at which the globe or map itself is located: if you moved the map, you would have to move the ‘you are here’ sign on the map. (Instead of the ‘you are here’ sign, we could draw the map itself on the map. Indeed, if the map was highly detailed and accurate, it would also show you standing there reading the map; assuming you recognised yourself, you would not then need the ‘you are here’ sign.)

¹² The block universe view is also analogous to the ordinary view of persons. Assuming everyone is equally well-informed about the world’s population and no-one is a solipsist, any person, when asked to draw a picture showing every person in the world, will draw the same thing—and the picture is in no way incomplete because it lacks an indication of who is the ‘I’: for there is no objective I.

¹³ Cf. McCall (1976, 342): “We thus have not one but many universe-pictures, each one being a complete state-description of the universe *at a time*.”

¹⁴ In Figure 3 her pictures are shown as two-dimensional because only two spatial dimensions are shown (cf. n.9).

¹⁵ Nowism *without* the A-theory would yield a ‘stopped clock’ version of presentism; cf. 1933-ism mentioned above.

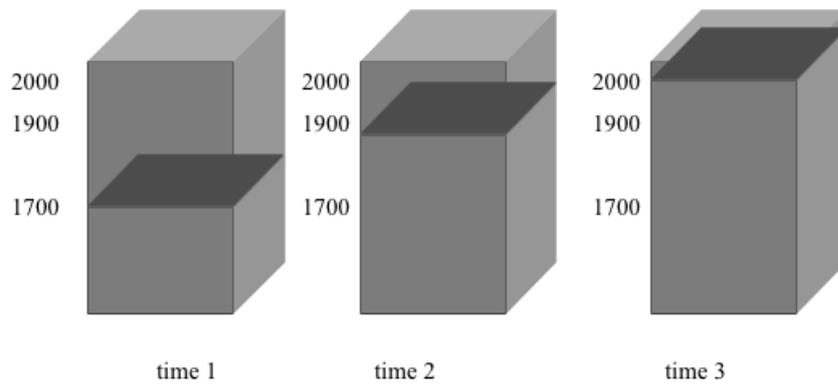


Fig. 2 The moving spotlight view

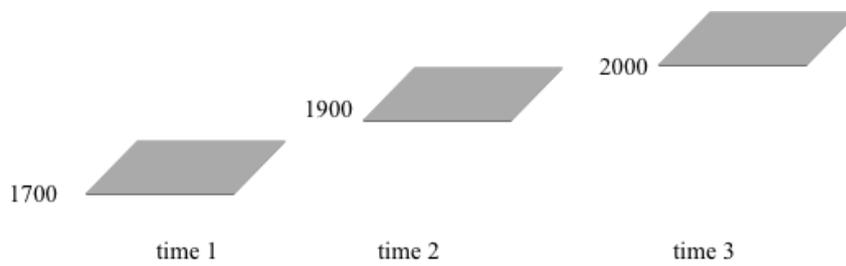


Fig. 3 The presentist view

The growing block theorist always draws a four-dimensional block (Figure 4):

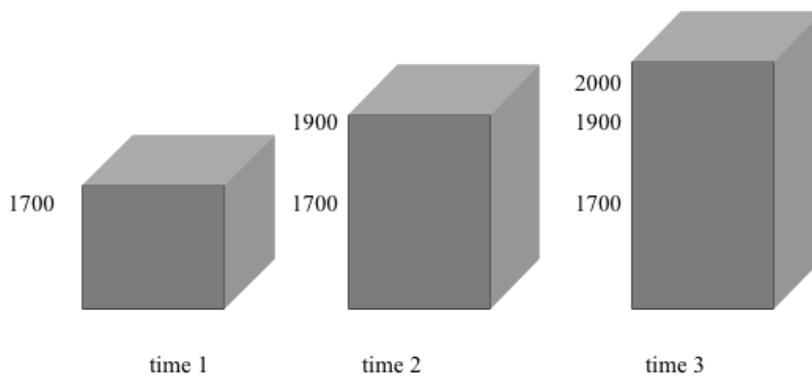


Fig. 4 The growing block view

but not the entire block drawn by the block universe and moving spotlight theorists; rather, just the part up to and including the time which the moving spotlight theorist

shows as illuminated by the light of now. So just as the moving spotlight theorist shows the light of now further up the block, the later we ask for her picture, so the growing block theorist draws a bigger block, the later we ask for it.

2 The contradiction in the A-theory

We turn now to the demonstration of the claim that the A-theory involves a contradiction. McTaggart's own argument for this claim involves two steps:

1. The A-properties (*past*, *present* and *future*) are logically incompatible.
2. The A-theory implies that every time has all three A-properties.¹⁶

In §2.1 I expound McTaggart's argument for 1, which I take to be correct. In §2.2 I first discuss McTaggart's and Mellor's arguments for 2, before presenting my new argument for 2 in §2.2.1. In §2.2.2 I argue that although the A-theorist can avoid the inconsistency brought to light in §2.2.1 by positing hypertime, this move leads to other severe problems.

2.1 The A-properties are logically incompatible

The *A-properties* are those temporal properties defined with reference to the objective now (recall that one of the defining features of the A-theory is its commitment to an objective now). The A-properties therefore include *past* (earlier than the now), *present* (contemporaneous with the now) and *future* (after the now), as well as 'one week before the now', 'between ten and twenty years after the now', and so on. The *B-properties* are those temporal properties which can be defined in terms of the block universe view. Thus the B-properties include 'before' (i.e. 'earlier than'), 'simultaneous with' and 'after' (i.e. 'later than').¹⁷

Note that we take A-properties to be defined in terms of the *objective* now—as opposed to being defined in terms of the *word* 'now'. The block universe theorist can give a perfectly coherent account of the truth conditions of sentences containing 'past', 'present', 'now', 'future', 'one week ago' and so on. The key point is that this account makes no reference to an objective now. On the other hand, if we *do* believe in an objective now, then we can define a property of being 'earlier than the now'—and this will be an A-property. Note that an A-theorist *need not* appeal to this property in giving truth conditions for sentences containing 'past', 'ago' and so on: she might prefer the B-theorist's account of these locutions. Nevertheless, the A-theorist countenances a property—being earlier than the objective now—which the B-theorist does not countenance (because the B-theorist does not believe in an objective now)—and this property is an example of an A-property. In this paper, '*past*',

¹⁶ The argument goes through in exactly the same way whether we take the A-properties to apply to times or events. In the text I write in terms of times, but nothing hangs on this. If you find it more congenial to do so, then when I talk of a *time* (e.g. 1066) being *past* or *present* or *future*, you should substitute in its place some *event* which happened at that time (e.g. the Battle of Hastings).

¹⁷ Note that here and elsewhere, for the sake of ease of expression, I use the term 'property' for relations.

'*present*' and '*future*'—written with italics—should always be taken to indicate A-properties (i.e. 'earlier than the objective now', 'contemporaneous with the objective now', and 'later than the objective now' respectively). The A-properties will also sometimes be written without italics—in cases where using italics would interfere with the expression of emphasis—but in these cases it will always be obvious from the context that A-properties are intended.

A time—for example, 1900—can easily have multiple B-properties:

- is before 2000 (and 2001, etc.)
- is simultaneous with 1900
- is after 1700 (and 1699, etc.)

The A-properties *past*, *present* and *future*, however, are meant to be quite different. The A-theorist thinks that the B-theory is incomplete, that it leaves out the objective now, the objective A-properties of being *present*, *past* and *future*, and the objective flow or passage of time (the movement of the now). The A-property that 1900 has when it is *present* cannot then simply be the B-property of being simultaneous with 1900: 1900 always has this B-property, but which time has the A-property of being *present* is meant to *change*—that is the whole point of the A-theory. With this in mind, it is clear that the three A-properties are incompatible. There can only be one objective now, and the objective now cannot be everywhen. (If it was it would just collapse to the B-theory sense of 'now', where now is just whenever you are—a sense which can be defined without reference to an objective now.) But then no event can be more than one of *present*, *past* and *future*. If the objective now is on 1900, then everything before 1900 is *past* (or does not exist at all) and everything after it is *future* (or does not exist at all). Nothing can be both before and after the now, and so no event can have more than one of the A-properties *past*, *present* and *future*.

2.2 The A-theory implies that every time has all three A-properties

Having argued—along the lines laid out in the previous section—that the A-properties *past*, *present* and *future* are incompatible, McTaggart (1908, 468) goes on:

But every event has them all. If M is past, it has been present and future. If it is future, it will be present and past. If it is present, it has been future and will be past. Thus all the three incompatible terms are predicable of each event, which is obviously inconsistent with their being incompatible, and inconsistent with their producing change.

McTaggart recognises that A-theorists will have an immediate response to the charge of inconsistency:

It may seem that this can easily be explained. Indeed it has been impossible to state the difficulty without almost giving the explanation, since our language has verb-forms for the past, present, and future, but no form that is common to all three. It is never true, the answer will run, that M *is* present, past and future. It *is* present, *will be* past, and *has been* future. Or it *is* past, and *has been* future and present, or again *is* future and *will be* present and past. The

characteristics are only incompatible when they are simultaneous, and there is no contradiction to this in the fact that each term has all of them successively. (ibid.)

The A-theorist's response, then, is that each time is *successively* future, then present, then past, but does not have these properties *all at once*—and so there is no contradiction.

McTaggart goes on to argue that the A-theorist's response involves a vicious circle: "time cannot be explained without assuming time" (McTaggart 1908, 470). I agree that the A-theorist's response fails—but I do not find McTaggart's rebuttal of it compelling. I shall therefore present a new argument for the conclusion that the A-theory is inconsistent. Mellor is in a similar position to mine: although he himself finds McTaggart's rebuttal of the A-theorist's response convincing,¹⁸ he says that "too many people have managed to inoculate themselves against it. So if it is to wipe out belief in A-facts, as it should, we need a more virulent strain of it" (Mellor 1998, 75). I believe, however, that not only can we do better than McTaggart—we can also do better than Mellor. For both of their rebuttals of the A-theorist's response are *indirect*. McTaggart's rebuttal appeals to his arguments that time exists only if there is genuine change, and that there is genuine change only if the A-theory is correct (premisses 1 and 2 in the argument presented at the beginning of this paper). The argument is then that the A-theorist's response involves the following vicious circle: in talking of events being *successively* past, present and future, the response makes use of temporal notions; but until we have a coherent A-theory, we have no coherent conception of time (because time exists only if there is genuine change, and there is genuine change only if the A-theory is correct); thus, temporal notions cannot be used to *show* that the A-theory is in fact coherent. Mellor's argument is likewise indirect: as he notes, it is "nurtured on the B-facts that make A-propositions true or false" (Mellor 1998, 75). Mellor argues that there is no plausible semantics for claims such as 'event *e* is past' which makes essential reference to A-properties. The argument is indirect in two ways. First, it appeals to auxiliary theses about propositions, tokens, facts, and truthmaking. Second, it arrives at the conclusion that A-properties are *pointless*, because they play no role in the semantics of claims such as 'event *e* is past', when that was precisely what they were originally supposed to do—as opposed to the conclusion that positing A-properties leads to *contradiction*.

In contrast, I shall offer a direct argument for the conclusion that the A-theory is inconsistent. It will be direct in two ways. First, it appeals to no new notions: it involves no auxiliary theses or arguments; it features only concepts introduced in describing the A-theory and the B-theory in the first place. Second, it reaches the conclusion that the A-theory is inconsistent. Putting these two points together, the upshot is that the A-theory is *internally* incoherent.

We begin with the A-theorist's response to McTaggart's charge of inconsistency. When the A-theorist says that each event is *successively* future, then present, then past, she means each event is *at one time* future, *at another time* present, and *at yet another time* past. What are these times? There are two options:

¹⁸ Or at least his own presentation of McTaggart's rebuttal: I have some doubts whether Mellor's version is really what McTaggart had in mind.

1. They are normal times: 1900, 2000, and so on.
2. They are hypertimes: times in a second time-dimension which is distinct from our normal time-dimension.

Let us consider these options in turn.

2.2.1 First option: normal times

The A-theorist's claim (on this first option) is that 1900 is present *in 1900*, future *in 1800*, and past *in 2000*—and that because it is not present, past and future *at the same time*, there is no contradiction. This is a mistake: there *is* a contradiction. To see this clearly, try to draw a spacetime diagram representing the A-theorist's position. (I shall not actually draw such a diagram in this paper, because—as we shall see—it is impossible to do so consistently.) Our spacetime diagram is to show everything that has happened, is happening and will happen, everywhere in the universe. Now because it is a picture of the A-theorist's view, we have to show where the objective *now* is. Well, the now has to be in 1800—to represent the fact that as of 1800, 1800 was present (remember, the diagram shows everything that ever was, is, or will be). It also has to be in 1900—to represent the fact that as of 1900, 1900 was present. It also has to be in 3000—to represent the fact that as of 3000, 3000 will be present. And so on: the now has to be everywhen. What about the objective property of pastness? Well, 1800 has to be shown as having this property—to represent the fact that as of 1900, 1800 was past. So already we have 1800 having the property *present*, and the property *past*. That's already a contradiction, given that these are A-properties. (There is of course no contradiction if the multiple properties which 1800 is shown as having are just the B-properties of being simultaneous with 1800, being before 1900, and so on—but then the A-theory collapses to the B-theory.) By the same reasoning we can multiply the contradictions: *every* time must be shown as having *all three* of the incompatible A-properties *past*, *present* and *future*.

In order to make it vivid that this is an inconsistent picture, let us represent the three A-properties *past*, *present* and *future* in our diagram using the three incompatible colours red, green and blue. That is, we show that a time has the property of being *past* (*present*, *future*) by colouring it red (green, blue) in our diagram. Obviously, every time will have to be coloured red, green *and* blue: and this is impossible.

Recall our initial presentation of the A-theory. A-theorists will want to draw *different* pictures of reality at different times (showing the block growing over time, or the spotlight moving, and so on). What I am now pointing out is that if these different diagrams are meant to represent the situations at different *normal* times then they *must* be able to be combined into one four-dimensional spacetime diagram. The A-theorist cannot draw one diagram showing the situation as of 1800, and another one showing the situation as of 1900—where 1800 and 1900 are two normal times (as opposed to hypertimes)—and then maintain that the two diagrams cannot be combined into one: that would just be to misunderstand spacetime diagrams. By definition, a spacetime diagram shows everything that has happened, is happening and will happen—at any normal time—and *by her own admission* (on this first option), the A-theorist has not countenanced any other time stream, and so has not countenanced

any events outside four-dimensional spacetime. It is simply a confusion to think *both* that “nothing that happens happens outside these four walls of spacetime—there is no other time dimension” *and* that one cannot draw a single four-dimensional spacetime diagram representing the entirety of what has happened, is happening and will happen. The A-theorist (on this first option) says that time 1—the time at which she drew her first picture—was a normal time; say 1800. Well then, that picture can be incorporated into our single spacetime diagram: for all the times *in* the picture, *and* the time at which the picture was drawn, are in that single diagram. Similarly for all the other pictures—given that the times at which they are drawn (time 2, time 3, and so on) are normal times. But then of course—and this is my point—when we do combine the pictures into a single spacetime diagram, we instantly see the contradiction in the A-theory: every time has to be shown as having all three of the incompatible A-properties *past*, *present* and *future*. (As already mentioned, the contradiction is avoided if the multiple properties which each time is represented as having are B-properties. There is no contradiction in representing 1800 as simultaneous with 1800, later than 1700, earlier than 2000, and so on. But if the A-theorist takes this route, her view simply collapses to the B-theory.)

Primitive tense operators

A-theorists may protest at this point that they employ *primitive tense operators* and that this means that they cannot in fact combine their separate pictures into one spacetime diagram, even though they regard the times at which the pictures are drawn as normal times (not hypertimes). This, however, is a mistake. What is required for the above argument to go through is that any tense operators which the A-theorist employs be *detachable*; whether or not these operators are *primitive* is beside the point.

Consider the following claim, which employs the metric tense operator ‘in 25 years’:¹⁹

(A) In 25 years, the population of Sydney will be 7 million.

When I say that the operator ‘in 25 years’ is detachable, what I mean is this: if (A) is true now, then if I wait 25 years, the population of Sydney will in fact be 7 million. That is, if ‘in 25 years’ is detachable, then a true claim made now using the operator ‘in 25 years’ has import for—gives us information about—how things will be in 25 years. In 25 years, we can detach the tense operator and conclude that the population of Sydney is in fact 7 million (given that (A) is true). On the other hand, the tense operator ‘in 25 years’ has *quantificational semantics* if claims such as (A) have the following truth conditions:

(A) is true now iff there is a time 25 years in the future at which the population of Sydney is 7 million.

When A-theorists say that their tense operators are *primitive*, they mean that they do *not* have quantificational semantics. Fair enough. A block universe theorist can accept the above truth conditions for (A), but a presentist cannot (assuming she thinks (A)

¹⁹ The point is entirely general: it applies just as well to non-metric tense operators such as ‘it will be the case that’.

is true)—for she thinks it is false that there is a time 25 years in the future (and so, a fortiori, false that there is a time 25 years in the future at which the population of Sydney is 7 million).

Now consider the single spacetime diagram which we are asking the A-theorist to draw. It is *not* supposed to show everything that *exists*; it is supposed to show everything that ever has happened, is happening or will happen. It is meant to provide *information* about what happened, happens and will happen when and where. So the presentist—even though she employs primitive tense operators—has no reason to balk at showing dinosaurs in 100,000,000 BC and moon bases in AD 3000. Of course she does not think dinosaurs and moon bases *exist*, but she *does* think that there will be moon bases in AD 3000 (or so we may suppose for the sake of the example) and that there were dinosaurs in 100,000,000 BC—and, to repeat, the diagram is not supposed to show everything that *exists*, it is meant to provide complete information about what was, is and will be. It is meant to be a plan of what to *expect* when, rather than a map of how things *are*—and the crucial point is that the A-theorist’s plan is inconsistent. That is to say, the package of information she provides about what has happened, is happening and will happen involves contradictions: it involves each time having all three of the incompatible A-properties.

So the fact that the A-theorist uses primitive tense operators does not stand in the way of combining her successive pictures of reality into one four-dimensional spacetime diagram. What *would* stand in the way of combining the A-theorist’s pictures into one spacetime diagram would be if her tense operators were non-detachable. But then they would not be genuine tense operators at all (they would be more like pretence operators). An analogy will help to make this clear. Suppose that we wish to draw up a plan of a certain region of countryside. Standing at one boundary of the area of interest, you look through your rangefinder binoculars and see a house at range 1km and a sawmill at range 2km. Walking forward 2km, you look again and see a mountain at range 2km. Putting together your observations, you draw up the plan shown in Figure 5. This need in no way trouble your *hereist* friends (who think

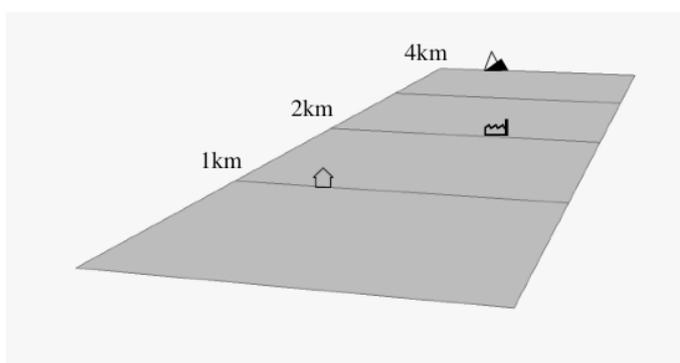


Fig. 5 Plan of the terrain, given detachable range operators

that only things around here exist: that distant objects do not really exist). They will simply interpret the plan not as showing what exists, but as giving information about what you would encounter were you to travel certain distances in certain directions. This is useful information, and there is no problem at all—even for hereists—about presenting it in this way. In other words, drawing this plan does not in any way depend upon giving a quantificational semantics to our range operators—that is, interpreting ‘in 1km there is a house’ as saying ‘there is a place 1km from here at which there is a house’.

But now consider someone who employs non-detachable range operators. He will object that the plan in Figure 5 cannot legitimately be derived from the observations made. The rangefinder tells us ‘in 1km there is a house’. This has no implications at all for what we can put at the 1km mark on our plan: for the range operator ‘in 1km’ is non-detachable. The only plan we can legitimately draw up is the one shown in Figure 6. I take it that this is an absurd position. If ‘in 1km P ’ does not allow

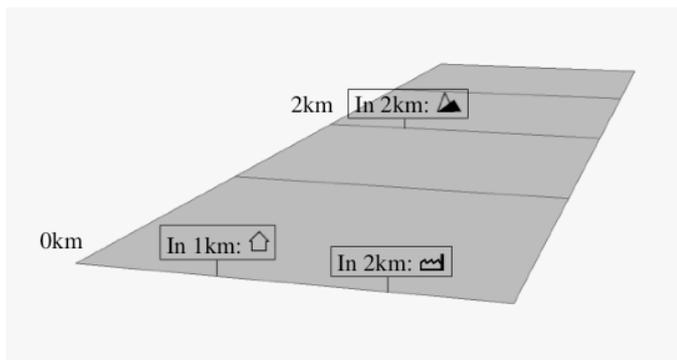


Fig. 6 Plan of the terrain, given non-detachable range operators

us to draw any information about goings-on 1km from here, then ‘in 1km’ is not worthy of the name ‘range operator’. Note that I am not saying that this view is absurd because it is committed to hereism, which is absurd: the view that range operators are non-detachable does *not* entail a commitment to hereism, and furthermore I do not regard hereism as *absurd* (although I do think it is incorrect). Rather, the view under consideration is absurd because it involves a view of ‘range operators’ on which such operators are really no such thing at all: a view on which, from the truth of the claim ‘in 1km there is a house’, I can conclude *nothing* about goings-on 1km from here; that is, on which I cannot draw a house on my plan at the 1km mark, even once it is acknowledged that my plan is *not* to be regarded as a representation of what exists, but only as giving information about what we can expect to find when we travel certain distances in certain directions.

The view that tense operators are non-detachable is equally absurd. If tense operators are non-detachable, then we are not permitted, on the basis of the present truth of ‘in 25 years [such and such]’, to mark certain information on our (purely infor-

mational, non-existentially committing) spacetime diagram at a point 25 years from now; we are not permitted to conclude anything, 25 years from now, about how things are. In other words, true future tensed statements give us no basis on which to make future plans: for the present truth of ‘tomorrow it will rain’ does not allow us, tomorrow, to detach the tense operator and conclude that it is raining. I take it that this is absurd—that non-detachable ‘tense operators’ would not be genuine tense operators at all.

Thus the presentist cannot avoid our earlier argument that her view involves a contradiction, by saying something along the following lines:

2010 is present, and thus 2060 *is* future. 2060 *will be* present (in 50 years)—and so 2010 will be past. But there is no contradiction in saying that a certain time *is* present and *will be* past, or *is* future and *will be* present.

In fact there is a contradiction—given that ‘present’ and ‘future’ here denote genuine A-properties (we already noted that the A-theorist can avoid contradiction, at the cost of collapsing her view to the B-theory) and given that the tense operator ‘in 50 years it will be the case that’ is detachable (as it must be, if it is to be any kind of tense operator at all). We can see this by plotting the information given in the above statement from the A-theorist on a spacetime diagram. The diagram must show 2010 in green (present) and 2060 in blue (future): to encode the information we are given as to how things are as of 2010. But it must also show 2060 in green, and 2010 in red (past): to encode the information we are given as to how things will be as of 2060. (Remember, the diagram—being a four-dimensional spacetime diagram—includes *all* information about how things were, are and will be.) That is impossible—which is a way of bringing out vividly that the A-theorist’s story—her total package of information about what has been, is and will be—is inconsistent.

Finally, should the A-theorist protest at this point that she wants to draw one spacetime diagram showing how things are (across all space and time) now, and a *different* one at a later time, then we are back to the point already discussed: if the times at which the diagrams are drawn are normal times, then—as all the times in them are also normal times—they *can* be combined into one diagram. As we have noted, it is simply a confusion to say that “nothing that has happened, is happening or will happen occurs outside these four walls of spacetime”, and yet deny that one four-dimensional spacetime diagram is enough to depict everything that has happened, is happening or will happen.

Of course, the story is quite different if the times at which the diagrams are drawn are *not* normal times. We turn to this second option now.

2.2.2 Second option: *hypertimes*

The A-theorist can avoid the inconsistency brought to light in §2.2.1 by saying that the times at which 1800 is successively *future*, then *present*, then *past* are *not* normal times, but *hypertimes*.²⁰ Think of hypertime as God’s time. God sits watching our universe. Normal time—from beginning (if it has one) to end (if such there be)—is all *inside* what God is looking at—but God’s watch hands go around, ticking off

²⁰ Hypertime is also known in the literature as ‘metatime’ and ‘supertime’.

hypertime, as God watches. What does God see? The A-theorist wants to say that God sees that a unique one of our normal times is objectively distinguished—it is the objective now—and that this now moves (through the series of normal times, from earlier ones to later ones). That is to say, at first (in God’s time—say at God’s time 12pm), 1800 (in our time) is the objective now. At this time (in God’s time), 1900 is therefore *future* (later than the now) and 1700 is *past* (earlier than the now). Later—say at God’s time 1pm—1900 (in our time) is the objective now. At this time (in God’s time), 2000 is therefore *future* (later than the now) and 1800 is *past* (earlier than the now). And so on.

This story is perfectly coherent: it involves no contradiction. Recall our initial presentation of the A-theory: we said that the A-theorist will want to draw *different* pictures of reality at different times (showing the block growing over time, or the spotlight moving, and so on). On the option that we are considering now, these different times are different hypertimes: and so we cannot argue that the separate diagrams must be able to be combined into one four-dimensional spacetime diagram. That would be a mistake: for the times at which the pictures are drawn are *not* represented in any of the pictures themselves.

So this view is consistent. It is not, however, a view that A-theorists have tended to embrace.²¹ It is not hard to see why A-theorists have shied away from hypertime: for while countenancing hypertime allows for the formulation of a *consistent* A-theory, the resulting theory has a number of extremely unattractive features. I shall now discuss some of these features. Although I shall present them in my own way, the first two points to be made are more or less familiar from existing discussions; the third point, which I regard as posing the most serious problem for the A-theory, is new.

First, the A-theory with hypertime is ontologically extravagant. Compared with the block universe view, the hypertime versions of the moving spotlight and growing block views posit a lot more stuff: they posit something of more or less the size of the block universe for *each* moment of hypertime. The hypertime version of presentism does not posit more stuff (assuming that there are not more moments of hypertime than of normal time)—for it posits a three-dimensional thing for each moment of hypertime, just as the block universe view posits a three-dimensional thing for each moment of normal time. Nevertheless, the view still seems excessively complex: for rather than having the three-dimensional things stacked neatly into a four-dimensional block, the hypertime version of presentism has them strung out in a fifth dimension.

Second, the hypertime versions of the A-theory face a problem of infinite regress. In order to make sense of the idea that time *flows* (objectively)—that the objective now *moves*—the A-theorist was forced to posit hypertime. But presumably the A-theorist will think that hypertime, if it is to be worthy of the name ‘time’, must also flow: there must be an objective hypernow, and it must move through hypertime. But in order to make sense of this we shall require hyperhypertime—and so ad infinitum.

Third, the major motivating factor for most A-theorists is the feeling that no adequate explanation of the phenomenology of the flow or passage of time is avail-

²¹ See for example McCall (1998). Of course, some authors do take the hypertime idea more seriously; see for example Schlesinger (1980).

able from within the block universe perspective. A-theorists argue that only a theory which posits an *objective* flow of time—a movement of the objective now through time—can provide an adequate explanation of this phenomenology. But once we have brought in hypertime to make sense of the idea of an objective flow of time—as we must, for (as we have seen) the idea that the objective now moves is inconsistent in the absence of hypertime—it becomes clear that the objective movement of the now through normal time, as hypertime passes, provides no explanation of the phenomenology of time’s passing. The idea is supposed to be something like this: we are stuck in the objective now, and as the now moves through time, we feel this movement—we feel the wind in our faces, so to speak. This is the feeling of time passing. Now one problem with this is, of course, that beyond the metaphor of feeling the wind in our faces, it isn’t at all clear how we could in fact feel the movement of the now. But there is an even bigger problem: there is no basis in the A-theory plus hypertime picture for the idea that we are stuck in the objective now. This is relatively obvious when we consider the growing block and moving spotlight views. Consider a moment t_1 of hypertime, at which the objective present is 1800. Later in hypertime, at t_2 , 1801 is the objective present. What happened to the persons in 1800 as the now moved? *Nothing*. At hypertime t_2 they are still there, in 1800, doing exactly what they were doing at t_1 . The now did not carry them along as it moved forward: it left them exactly when they were. Furthermore, apart from the fact that it is no longer the objective now, there is no difference whatsoever between the version of 1800 located at hypertime t_2 , and the version located at hypertime t_1 . (Not only are all the physical states of the persons in 1800 at t_2 the same as the physical states of the persons in 1800 at t_1 , but if one also has a non-physical ‘now-detecting’ faculty, *it too* is in the same state in 1800 at t_2 as in 1800 at t_1 . For according to the growing block theorist, the *only* thing that happens to the block as time passes is that new layers get added, and according to the moving spotlight theorist, the only thing that changes as the objective now moves is the position of the objective now.) So if the persons in the version of 1800 located at hypertime t_1 were feeling ‘in the now’, the persons in the version of 1800 located at hypertime t_2 must be having the same feeling. But then that feeling has nothing to do with the presence of the objective now.

One might think that the presentist is immune to this problem. On the presentist view, 1800 is located at hypertime t_1 and *not* at hypertime t_2 : 1801 is located then. On the presentist view—unlike on the other variants of the A-theory—there is no *second version* of 1800 at t_2 . True enough. But come t_2 , 1800 still *exists*: in the hyperpast. Precisely because there is only one version of 1800, its inhabitants must be feeling ‘in the now’ *always*, or *never*—regardless of what the objective now is up to. The only way for the presentist to avoid this conclusion—to get rid of 1800 entirely come hypertime t_2 , rather than having it hanging around in the hyperpast—is to be a presentist about *hypertime*. That, of course, will make sense only if we posit hyperhypertime—and so again we are off on an infinite regress. For if we stop with some finite number n of hypertime dimensions, then we will be stuck with 1800 hanging around in the hyper ^{n} past (where ‘hyper ^{n} ’ is n repetitions of ‘hyper’).

The fact that positing hypertime is thus of no help when it comes to explaining the phenomenology of time’s passing lends bite to the ontological extravagance charge made above: we are indeed justified in deeming the hypertime versions of the

A-theory *unnecessarily* complex—rather than simply *very* complex—given that the extra complexity confers no advantage when it comes to solving the problem which provides the principal motivation for the A-theory: the problem of explaining why time appears to pass.

Conclusion

A-theorists want to draw different pictures of reality, depending upon the time at which we ask for the picture. The times at which the different pictures are drawn may be taken to be normal times or hypertimes. If they are normal times then the A-theory is inconsistent (or else collapses to the B-theory). If they are hypertimes then the A-theory is consistent, but deeply problematic none the less.

Acknowledgements Thanks to John Cusbert, Huw Price, David Braddon-Mitchell, Kristie Miller and an audience at the Centre for Time at the University of Sydney on 30 April 2007 for helpful comments and discussions. Thanks to the Australian Research Council for research support.

References

- Caspar John Hare. *On Myself, and Other, Less Important Subjects*. Princeton University Press, Princeton, 2009.
- Tim Maudlin. *The Metaphysics Within Physics*. Oxford University Press, Oxford, 2007.
- Storrs McCall. Objective time flow. *Philosophy of Science*, 43:337–362, 1976.
- Storrs McCall. Time flow does not require a second time dimension. *Australasian Journal of Philosophy*, 76:317–22, 1998.
- J. Ellis McTaggart. The unreality of time. *Mind*, 17:457–74, 1908.
- J. Ellis McTaggart. *The Nature of Existence*, volume 2. Cambridge University Press, Cambridge, 1927.
- D.H. Mellor. *Real Time II*. Routledge, London, 1998.
- George N. Schlesinger. *Aspects of Time*. Hackett, Indianapolis, 1980.
- Theodore Sider. *Four-Dimensionalism: An Ontology of Persistence and Time*. Clarendon Press, Oxford, 2001.
- Quentin Smith. General introduction: The implications of the tensed and tenseless theories of time. In L. Nathan Oaklander and Quentin Smith, editors, *The New Theory of Time*, pages 1–14. Yale University Press, New Haven, 1994.
- Dean W. Zimmerman. The A-theory of time, the B-theory of time, and ‘taking tense seriously’. *dialectica*, 59:401–57, 2005.