

Philosophy of Space and Time: Week 6

Static vs. Dynamic Views

We have an intuition that far-future moments become near-future moments, which become present moments, which in turn become near-past and far-past moments, in an endless ‘flow of time’. *But*: Is temporal passage—or *becoming*—truly an objective feature of reality?

- *Dynamic* views hold that temporal passage is fundamental.
- *Static* views deny this.

The Flow of Time

What could it mean for time to ‘flow’?

- ‘Flow’ seems to imply motion, but motion is usually change with respect to time.
- Can time move or flow with respect to time? A rate of 1 second per second is just a dimensionless number—it doesn’t express the kind of thing we wanted to express by ‘time flows’ at all.¹
- Maybe time flows with respect to some additional parameter—some ‘supertime’. But will this lead to a regress of times?

The moral: Talk of time ‘flowing’ is problematic. It might be better to replace this talk with talk of ‘becoming’. ‘Time flows’ gets translated to talk of passage or becoming being an objective feature of reality. Of course, we then need this notion of passage/becoming not to suffer from the same problems that flow does!

¹Cf. Olson, “The Rate of Time’s Passage”, *Analysis* 69, pp. 3-9, 2009.

McTaggart's Argument

McTaggart presents an argument not just against time's *passage*, but against *the reality of time simpliciter*. To do so, he first distinguishes two *temporal series*:

A-series: We can order events according to whether they are past, present, or future. This morning's breakfast happened in the past; this seminar is happening now, in the present; your afternoon is in the future.

B-series: We can also order events according to their temporal relations to one another—*earlier/later than*, etc.

Truth values of B-facts (i.e., facts employing B-series terminology, but not A-series terminology) are permanent and never change, whereas truth-values of A-facts (i.e., facts employing A-series terminology) change over time. With this in mind, we can state McTaggart's argument for the unreality of time as follows:

1. If there is a B-series, then there is time.
2. If there is time, then there is change.
3. If there is change, then there is an A-series.
4. But: there is no A-series.
5. Therefore,² there is no time.
6. (Therefore, there is no B-series.)

McTaggart Against the A-Series

For us to make sense of the above argument, we need to understand (4). McTaggart's reasoning for this premise runs as follows:

²By repeated application of *modus tollens*.

- A. Past, present, and future are mutually incompatible A-times.
- B. Each event is always changing its A-times.
- C. Therefore (from (B)), each event is all three of past, present, and future.
- D. Contradiction ((A) and (C)), therefore, there is no A-series.

Standard response: Question (C). Events have these A-times only in succession, never all at once, and nothing prevents anything from having incompatible properties at different times.

McTaggart's counter-response: This leads to a vicious infinite regress.³ To see this, let e be any event, and let P , N , and F represent the A-times *past*, *present* (now), and *future* (respectively). Then, we could formulate McTaggart's argument as stating that P , F , and N are mutually incompatible, so (I) below holds, yet the A-series flow of time requires that (II) also holds, in which case a contradiction beckons.

$$(I) \quad Pe \rightarrow \neg Ne; Pe \rightarrow \neg Fe; Ne \rightarrow \neg Pe; Ne \rightarrow \neg Fe; Fe \rightarrow \neg Pe; Fe \rightarrow \neg Ne.$$

$$(II) \quad Pe \wedge Ne \wedge Fe.$$

The standard response to this reasoning (indicated above) is that e has no more than one of these incompatible A-times at once, so there is really no contradiction. In other words, we have not (II) above, but (III) below, which is not incompatible with (I). *However*, McTaggart argues, just as every event has all three simple A-times if it has any, so it also has all nine possible *complex* A-times. Why? The crucial step is the following. Inexorable changes of A-times will require us to replace (III) with (IV), in which case we again have a contradiction—the conjunction of (III) and (IV) is just as incompatible as the original (II).

$$(III) \quad FPe \wedge Ne \wedge PFe.$$

$$(IV) \quad FPe \wedge NPe \wedge PNe.$$

³The following presentation from Mellor, *Real Time II*, ch. 7. McTaggart also presents his argument for (4) via a (purported) vicious *circle*. It's an interesting open problem how the vicious circle argument connects with the vicious regress argument.

So: we have a regress on our hands. (**Question:** Why should we consider this a *vicious* regress?)

Lowe's response to McTaggart: Lowe proposes that we should not maintain (III) or (IV) above, but rather (V) as given below. (V) is not self-contradictory, and unlike (III) and (IV) is true at all times.

$$(V) (PPe \vee NPe \vee FPe) \wedge (PNe \vee NNe \vee FNe) \wedge (PFe \vee NFe \vee FFe)$$

If (V) really does capture all that is intended in the statement “every event exhibits all A-series positions”, from which McTaggart's paradox is typically considered to arise, then the paradox will have been dissolved.

But there is a worry about Lowe's approach. (V) is a claim that does not change over time—so it appears to efface this fundamental aspect of the A-series. To bring this point out more clearly, consider the spatial analogue of (V)—a given object *o* is from one perspective *here* (*H*), and from another perspective *there* (*T*). Formalising this in the manner of (V), we have:

$$(VI) (HHo \vee THo) \wedge (HTo \vee TTo)$$

While (VI) is uncontroversially true, the proposition that there is a spatial analogue of the passage of time is likely false—in which case, we must conclude that there is something wrong with (V) as an account of the passage of time.

Responding to McTaggart's Argument

The upshot of the above seems to be that McTaggart's argument for (4) *does* go through. However, there is still room to deny e.g. (2) or (3). B-theorists such as Mellor (*Real Time II*, p. 122) deny (3), for example. How can an account of change be given without invoking the A-series? Mellor says that the solution lies in the ways our memories accumulate:

So, for example, when you see that it is 10:25, you also remember seeing the clock showing it to be 10:15; when you see the clock showing 10:29, you remember

observing it showing 10:25 *while also remembering having seen it showing 10:15*.
(Dainton, p. 30)

Question: How does this yield a notion of *change*?

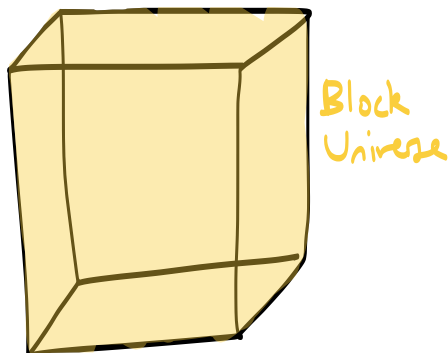
In any case, considerations such as these demonstrate that even if McTaggart has argued successfully against the notion of *passage*, he has not necessarily successfully against the notion of time *tout court*.

The Metaphysics of Time

Let's now move on to consider various metaphysical pictures in the philosophy of time.

The Block Universe

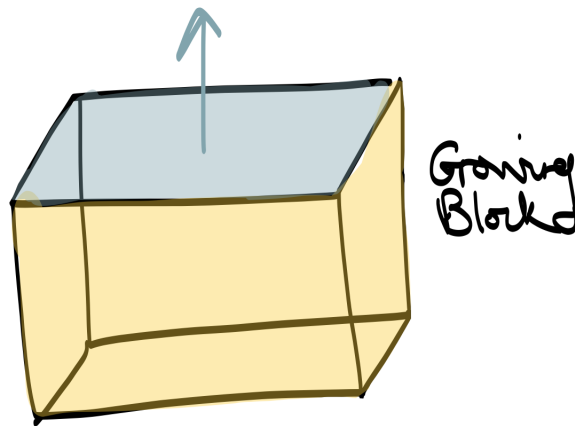
Eternalism holds that past, present and future events are all equally real.



Reality is a four-dimensional *block universe* (time is the fourth dimension here). All events that have ever happened or will ever happen are equally real.

The Growing Block

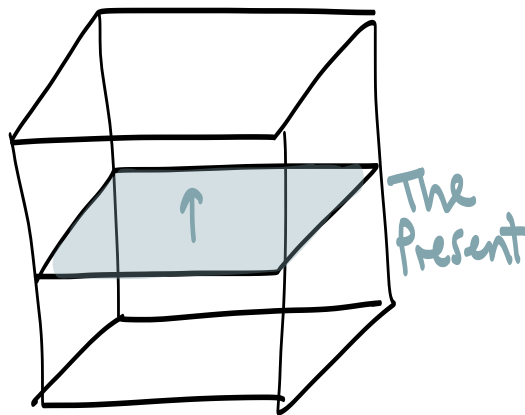
Advocates of the *growing block* hold that the past and present are real, but the future is not.



Reality is four-dimensional, but the four dimensional block grows over time.

Presentism

Presentism holds that all that exists is what exists now.



Reality is three-dimensional, and changes in time; the past and future are unreal. Dainton (ch. 6) outlines several different varieties of presentism:

1. *Solipsistic presentism*: Nothing exists that is not present, and only one present ever exists—*this* one. (A static view)
2. *Many-worlds presentism*: Reality as a whole includes many momentary presents that

are *not* temporally related to one another, and so do not succeed each other in any way.
(A static view—**question**: how does this differ from the block view?)

3. *Dynamic presentism*: Reality takes the form of a succession of instantaneous (or near-instantaneous) presents; no sooner has one present come into existence than it will depart from it, to be replaced by another.⁴

Connections

It's natural to group, e.g.,

1. Presentism/dynamic views/A-series.
2. Eternalism/static views/B-series.

However, one should be wary of thinking that these connections are stronger than they are. They need not necessarily hold; for example,

- Solipsistic and many-worlds presentism are presentist static views.
- Eternalism (i.e. the block universe picture) is compatible with events having auxiliary, A-series properties.

⁴Note: The above figure, with the arrow, best fits the dynamic presentist model.