

Past, present and future¹

Summary

This course is for Part IA of the Philosophy Tripos. In it I discuss the significance of dividing time into past, present and future: the flow of time; whether the future exists; fatalism; the generality of predictions; the nature of change; how time differs from space. I shall then discuss objections to supposing that past, present and future are real properties of anything, and show how to account for the apparent differences between them on a tenseless view of time.

References:

- Ayer, A. J., 'Fatalism', *The Concept of a Person, and Other Essays*.
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 Le Poidevin, R. and MacBeath, M., eds, *The Philosophy of Time*, Introduction pp. 1–4.
 Mayo, B., 'The Open Future', *The Philosophy of Time*, ed. R. M. Gale.
 McTaggart, J. M. E., 'The Unreality of Time', *The Philosophy of Time*, ed. R. Le Poidevin and M. MacBeath.
 Mellor, D. H., *Real Time II*, chs 1–4, 6–8.
 Prior, A. N., 'Thank Goodness That's Over', *Philosophy* 34 (1959).

What follows from the division of time into *past*, *present* and *future*?

Are being past, present and future properties like being *hot* or *cold*, so that just as poker *changes* from hot to cold, so events *change* from future to present to past? The difference is that things *cool* at different rates (or not at all), but all events become less future or more past, and at the same rate: 24 hours a day. So it's a feature of time itself that all events are constantly changing from future to past via the present. That's what meant by saying that time *flows*.

Does time really flow?

This lecture was future on 13 January and will be past on 15 January. Is that a *change* in it or does the lecture just occur *after* 13 January and *before* 15 January? If the latter, there's no *change* in it: it just has different *relations* to two different days. So the question is: do events have the non-relational properties of being *past*, *present* and *future*, in which case time *does* flow, or just temporal *relations* – *later*, *earlier* – to times and other events, in which case time does *not* flow.

This question matters in itself and because others turn on it: e.g. some think future events don't *exist*, so to become present is to *come into existence*; which can't happen if time doesn't flow. For then the future must *always* have existed, which raises issues like *fatalism*. This course is an introduction to these basic questions.

Tenses (A-times)

To define time's flow, we need two ways of saying when events happen. The first uses **tenses**, by which I mean past, present and future and also locations like *noon yesterday*, *this week* and *next year*. These locate times and events by how much later or earlier they are than the *present*: *future* ones are *later* than it and *past* ones are *earlier* than it. Any time or event that *includes* the present – e.g. this lecture – is present. By *the* tense of an event I mean the *shortest* tense that just includes it, e.g. *60-54 years ago* for World War II (WW2).

(In *Real Time II* I call tenses 'A-times', from McTaggart's term 'A series'. Most philosophers still call A-times 'tenses', which is OK if they aren't confused with *verbal* tenses, i.e. verb forms used to refer to past, present or future.)

I use the term 'A series' for a series of events ordered by their tenses. As these are always changing – in ten years, WW2's tense will be *70-64 years ago* – the A series is also always changing.

Dates (B-times)

Dates (which in *Real Time II* I call 'B-times') are the other way of locating events. They show how much later or earlier events are than a given event, e.g. Christ's birth. This *zero* is arbitrary, like the zero on a temperature scale (the freezing point of water (Celsius) or brine (Fahrenheit)). So is the *unit* – hours or years – cf. inches or metres. But on a B-time-scale with a given zero and unit, an event's date is a plain matter of fact, like a temperature in Celsius or a length in metres. As with 'tenses', by *the* date of any event I mean the shortest date that just includes it, e.g. 1939-45 for WW2.

As the dates of events differ from their tenses by never changing – WW2's date is always 1939-45 – the 'B series' of events, ordered by their dates, never changes.

Dates and tenses

Tenses and dates are defined by the same temporal relations – earlier, later, simultaneous – and only differ because tenses, unlike dates, are defined by being related to the *present*. So as an event's tense is fixed by how much earlier or later its date is than the *present* date, the A-time-scale is just the B-scale *plus* a moving present – that is the flow of time.

So the final question is: as well as the B-scale, *is* there in reality a moving *present* which defines an A-scale? But before answering this question, i.e. saying whether or not time flows, we shall see what turns on it.

¹ A PDF version of these notes is kept at <http://www.dar.cam.ac.uk/dhm11/camonly/PPF.pdf>

How do past, present and future differ?

'Only what is past and present exists: what is future does not exist'

This is the most common tensed view. On it, to become present is to *come into existence*. This explains the flow of time as a continuous process of things and events coming to exist.

It also explains why we can't *see* anything while it's still future, because it isn't there to be seen, whereas the past *is* there to be seen.

It explains how we can *affect* the future by affecting *what* will come into existence. This also explains why we can see the past – since to perceive something is to be affected by it.

It only explains why we can't affect the past if the mere fact that the past exists explains why we can't affect it: see the later discussion of fatalism.

Presentism: 'Only what is present exists'

This is the most extreme tensed view. On it, to become present is also to come into existence, and to become *past* is to *go out of* existence. This explains the flow of time, and also how the present differs from the past – and where the past is: nowhere.

It does *not* explain how the past and future differ from each other: e.g. why we can see the past but not the future, and affect the future but not the past.

This view makes it hard to explain how an event *a* can be earlier or later than an event *b* – since *a* and *b* never exist together to be related in any way – and hence how there can be different *lengths* of time.

'What is past, present and future all exist'

McTaggart's view. On this view the number of *events* in the universe never changes: all that changes is which of them are past, present or future. The view does not explain why all events change in this way – i.e. why time flows – but just makes it a basic assumption, which it then uses to explain change in general and how in particular time differs from the dimensions of space.

Given the flow of time, this view can explain how the *future* differs from the *past*: futurity is the property which events have *first*, pastness the property they have *last*.

The view does not however explain how the present differs from the past and the future: it has to take this too as a basic notion,

On its own, the view can also not explain the causal differences between past and future, i.e. why we can see but not affect the past, and affect but not see the future.

But it does *allow* theories to explain this, by letting the differences between being past, present and future generate *modal* distinctions. Specifically it allows the common view that, while there is only one *actual* past, present and future,

'There are many possible futures, but only one possible past'

On this view, becoming present needn't be coming into *existence*: it can just be becoming *necessary*, i.e. fixed and unalterable. This explains the flow of time as a continuous process whereby just one of many possible futures – the actual one – becomes necessary and all the others become impossible.

This explains why we can affect the future, by affecting *which* possible futures will become present and hence necessary, which in turn explains why we can see the one and only actual past, by being affected by it.

Similarly, this view explains why we can't affect the past, since it is fixed and unalterable, and that then explains why we can't see the future even though it's there.

Fatalism

References: Ayer, Mayo.

Fatalist argument: If there are facts *now* about what *will* happen, i.e. if the *actual* future already exists, then as it's there already, there's no point in trying to affect it, since it will be the same whatever we do.

Fatalism is sometimes called *logical* determinism, to distinguish it from (physical) determinism, the thesis that what *has* happened in the past (plus the laws of nature) fix what *will* happen in the future. These are quite independent theses: either could be true and the other false; and I shall only discuss fatalism.

Since the fatalist conclusion – that we can't affect the future – is obviously *false*, the question is: what's wrong with the *argument* for it. Perhaps it's the suppressed premise, that there *is* an actual future?

The open ('empty') future

Suppose there are *no* facts (yet) about what *will* happen, and so no *true* propositions about the future. This entails that e.g. neither 'it will rain tomorrow' nor 'it won't rain tomorrow' are true. But that causes trouble for logic.

Two senses of '*p* is false'

(1) *p* is false = *p* is not true

This makes it *false* that it rains tomorrow and *false* that it doesn't. But then '*p* is false' no longer entails '*~p* is true'.

(2) *p* is false = *~p* is true

This makes all propositions about the future *neither true nor false* (since neither *p* nor *~p* is true).

This needs a logic with three truth values – True, False, neither – and all *contingent* propositions about the future get the third one. But if neither 'It will rain' nor 'It won't rain' are true, is 'It will rain or it won't' true or not? Either answer upsets the laws of logic.

The truth-value link

- Tomorrow, either 'It is raining' or 'It isn't raining' will be true.
- But if 'It is raining' is true tomorrow, 'It will rain tomorrow' is true today; and similarly for 'It won't rain tomorrow'.
- So today either 'It will rain tomorrow' or 'It won't rain tomorrow' is true.
- But by the *Equivalence Principle*, for all *p*, '*p*' is true iff (if and only if) it's a fact that *p*.
- So today either it's a fact that it will rain tomorrow, or it's a fact that it won't rain tomorrow.

Given the problems caused by denying that there's an actual future, see if we can admit it and still deny fatalism.

Readings of 'What will be will be'

'If *p* then *p*'

This is a *necessary* truth for *all p*, past, present or future: 'What is, is'; 'What was, was'. It doesn't make *p* a necessary truth.

'What will be can't be altered'

This is true. E.g. you couldn't see in a crystal ball that it *will* rain tomorrow and then *alter* the future so that it *doesn't* rain tomorrow: that's a contradiction – *p* and *~p*. And it's also true of the present and the past: e.g. time travel stories in which the past is altered make no sense.

How *not* to affect (only) the future

p in one possible world *w*, *~p* in another possible world *w'*

1. If *w* ≠ *w'* this is trivial: it just shows that *p* is *contingent*, e.g. it rains tomorrow in world *w* but not in *w'*.
2. If *w* = *w'* this is a contradiction: '*p*' and '*~p*' can't both be true in the same world.
1. Applies to *all p*, so it doesn't distinguish the future from the present or the past.

First *p*, then *~p*

- 1) If this means the flow of time, e.g. 'it will rain tomorrow' is true today but not tomorrow, it's trivial.
- 2) If it means 'It rains on 28 Jan 1999' is true today and not tomorrow, it's a contradiction.
- 3) Applies to *all p*, so it doesn't distinguish the future from the present or the past.

Causation and conditionals

Fatalist argument

Premise: '*p*' entails both '*If q, p*' and '*If ~q, p*'.

e.g. 'I will slim' entails both 'If I diet I will slim' and 'If I *don't* diet I will slim'.

But dieting causing me to slim requires 'I will slim if I diet' and 'If I *don't* diet I *won't* slim'.

Conclusion: We can't affect what already exists, which is why we can't affect what's past; so if future exists, we can't affect it.

Two kinds of conditionals

Indicative and counterfactual (subjunctive) conditionals

'Kennedy was killed' entails

(1) 'If Oswald *didn't* kill Kennedy someone else *did*' (*indicative*) but *not*

(2) 'If Oswald *hadn't* killed Kennedy someone else *would have*' (*counterfactual*).

The difference arises because (1) is about the *actual* world, in which Kennedy was killed – so if Oswald didn't do it someone else must have – whereas (2) is about the *possible* world closest to this one in which Oswald *didn't* kill Kennedy, and in which someone else may or may not have done so (depending on whether Oswald had a backup).

So suppose (1) is true and (2) is false.

Future conditionals: indicative or counterfactual?

If (2) is false the day after the killing, is

'If Oswald *doesn't* kill Kennedy someone else *will*' true or false: obviously false.

I.e. the apparently indicative future conditional is like a counterfactual: i.e. its truth depends on whether Oswald has a backup, and so is *not entailed by* 'Kennedy will be killed'.

Affecting the future

Assumptions about causation

(A) Causes (almost always) precede their effects: if *q* causes *p*, *q* precedes *p*.

e.g. For my dieting to cause me to slim, I must diet before I slim.

(B) Causation entails conditionals: '*q* causes *p*' entails '*If q, p*' (*q* is *sufficient* for *p*) and '*If ~q, ~p*' (*q* is *necessary* for *p*).

Causal conditionals

Suppose a future '*p*' ('I slim', 'Kennedy dies') is true. Then

If causal conditionals are counterfactual,

'*If ~q, ~p*' and '*If ~q, p*' are incompatible ('*p*' can't be false *and* true in the closest *~q* world) but '*If ~q, p*' can be false, so

'*If ~q, ~p*' can be *true* and *q* can cause *p*.

E.g. dieting can cause me to slim because 'If I don't diet I slim' isn't entailed by 'I slim'.

If causal conditionals are indicative,

'*If ~q, p*' must be true, but is compatible with '*If ~q, ~p*', since the latter is entailed by '*q*', so provided '*q*' is true,

'*If ~q, ~p*' can *also* be true, so that *q* can cause *p*.

E.g. dieting can cause me to slim because 'If I don't diet I slim' is compatible with 'If I don't diet I don't slim'.

So the fatalist argument fails whether causal conditionals are counterfactual or indicative.

The real reason we can't *now* affect the *past* is just that the past precedes the present and effects don't precede their causes.

'Generality of predictions'

'If future entities exist, why can't we refer to them?'

E.g. you can't refer to the first person conceived in AD2000: predictions like 'The first new millennialist will be male' are really *general*: '*Whoever* the first millennialist is will be a male'. This *may* be true, but doesn't show that future entities don't exist. Whether and when we can refer to existing entities may depend on how reference works.

Description theory of reference

'The first new millennialist' *does* refer to the particular person whom that description fits: we just don't know who that is – e.g. who his or her parents are – because the lack of backward causation stops perception telling us enough about the future.

Causal theory of reference

Reference to people and other empirical entities (not e.g. numbers) requires a *causal link*, e.g. our references to Hume work by being at the end of a causal chain starting e.g. with his writing his books which we then read. But then if there's no backward causation, we can't refer in this way to future entities even if they exist. So even if it is a fact that we can't refer to them, this doesn't show they don't exist.

Change

Change and the flow of time

Change is a thing having incompatible properties – different sizes, colours, temperatures, etc. – at different times. The flow of time is at least a special case: events having incompatible *tenses* – future, present past – at different times. But on a *tensed* view of time, there is *no* change unless time flows: why?

Temporal and spatial variation

Properties can vary across space as well as time:

- *Temporal variation*: poker is hot at t and cold at t' : change.
- *Spatial variation*: poker is hot at one end and cold at the other: not change – why not?

Answer seems obvious: change is *temporal* variation. But now ask: how does time differ from the dimensions of space? Standard answer: time is the dimension of *change*. This makes the definition of change as temporal variation *circular*.

Time and space as dimensions of spacetime

Why is distinguishing time from space more difficult than distinguishing it from (e.g.) temperature?

E.g. why not just say that temperature is what *thermometers* measure, space is what *rulers* measure, time is what *clocks* measure – and rulers aren't clocks any more than they're thermometers. Answer is that time and the dimensions of space form a *four-dimensional manifold*, which time and temperature don't.

Spacetime

Basic concept: Contact

Things are in *contact* if they're in *the-same-place-at-the-same-time*. This doesn't beg the question: it's a fundamental relation, which can either be taken as primitive (i.e. undefined) or defined causally: two things are in contact iff each of them can directly affect the other.

Four dimensions of spacetime

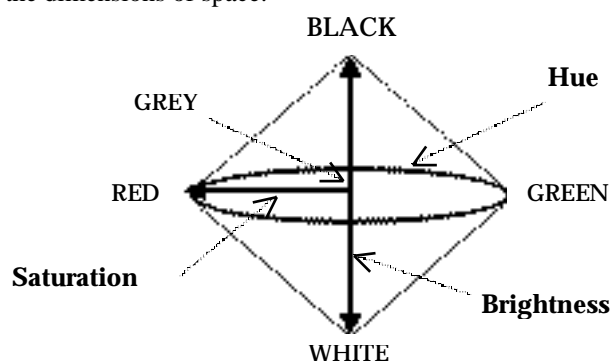
Spacetime has four dimensions, i.e. there are four independent ways of failing to be in contact, e.g. of failing to meet someone by being east or west, north or south, above or below – or earlier or later. To meet someone you must coincide in all four dimensions.

Spacetime is a four-dimensional 'space'

A 'space' is a set of possibilities: ordinary space is a set of possible points of contact *at a time*. Spacetime is the set of *all* possible points of contact. Calling spacetime a 4-D 'space' doesn't imply that time is spatial: it's just using 'space' for *any* set of possibilities. E.g. –

Colour 'space'

Different colours are different ways of *being the same colour*, i.e. of matching-in-colour, the colour analogue of contact. Colours form a colour-space with three dimensions: brightness, hue and saturation, each quite different from the others, just as time is different from the dimensions of space:



Time as the dimension of change

Tenseless change

A poker is hot at t , cold at t' : these facts are *unchanging*, just like the poker being hot at one end and cold at the other. How can we distinguish time from the other dimensions of space as the dimension of change, i.e. distinguish temporal from spatial variation without circularity?

Tensed change

If time flows, then at t , the poker's being *hot* is present, and at t' its being *cold* is present these are *changing* facts.

Thus a tensed view can use the flow of time to distinguish time from space as the dimension of change, namely as the dimension in which there is a flow, i.e. in which there are *changing* facts about what's *present*.

Tenseless theory of change

Distinction between time and space

A tenseless theory of change can take this distinction to be either *primitive* or based on *causation*:

- *Primitive*: The difference between time and space— e.g. the difference between a clock hand's *moving* and its being *broad* at one end — is observable and hence definable by *ostension*, as is that between clocks and rangefinders.
- *Causation*. Causes have effects in all directions in *three* dimensions of spacetime, but in only one direction in the *fourth*. This defines that dimension as time — 'the causal dimension of spacetime' and also defines its direction: *later* is the direction from *cause* to *effect*, *earlier* is the direction from *effect* to *cause*.

Definition of change

3. Change is temporal as opposed to spatial variation.

This definition is no longer *circular*, but it still needs a *justification*: why not let *spatial* variation count as change?

Objections to the tensed theory of change

Spatial analogue of tense

2. *Temporal A series* = 1-dimensional B series of events *plus temporally variable present*: at any B time *t*, *t* is temporally present, i.e. it is *now t*.

3. *Spatial A series* = 3-dimensional B array of things *plus spatially variable present*: at any B place *s*, *s* is spatially present, i.e. *s* is *here*.

Tensed theorists *accept* the A series but *deny* its spatial analogue, i.e. say that only time flows, spatial dimensions don't. This doesn't mean they need an independent way of distinguishing time from space. It is obvious that one dimension of spacetime differs from the others; and this is the tensed theory's account of that difference, which lets them define time as the one dimension of spacetime which *flows*, thereby explaining why only temporal variation should count as *change*.

But this leaves it a primitive fact that just one dimension of spacetime *does* flow. It doesn't explain why there couldn't be *no* flow, i.e. no time, or flow in *several* dimensions, i.e. several time dimensions.

Tenseless account of the experience of time flowing

Tenseless truth conditions of tensed beliefs

If P is a poker that is sometimes hot and sometimes cold, 'P is hot now' is true at any B-time iff P is hot at that time. Suppose P is hot at *t* and cools off until it is cold at a later time *t'*. Then

- 1) 'P is hot now' is true at *t* and false at *t'*.
- 2) 'P is hot at *t'*' is true *always*.

So even at *t*, the *tensed* belief 'P is hot now' differs from the *tenseless* belief 'P is hot at *t'*'.

Belief and truth

We always want our beliefs to be true, since truth is the property that makes them *useful*. Suppose e.g. your desire for coffee and belief that the buttery has some causes you to go there: if your belief is true, the action it combined with this desire to cause will *succeed*, i.e. achieve the object of the desire, by getting you coffee; whereas if it's false it won't.

Changing tensed beliefs

As tensed beliefs aren't always true, we need to change them to keep them true. As this doesn't happen automatically, we need clocks and other causes to change them at the right times: e.g. the changing colour of the poker P may cause me to change from believing 'P is hot now' to believing 'P is cold now' — and hence to pick the poker up. These changes constitute our *experience* of the flow of time: they are real changes, and can be *veridical*, even if time does *not* flow.

Why there is no experience of space flowing

Why do we not experience space flowing, e.g. by believing 'It's hot here' at a hot place *s* and 'It's cold here' at a cold place *s'*? This could happen if I *moved* from *s* to *s'*, believing 'It's hot here' at *s* at *t* and 'It's cold here' at *s'* at *t'*. But this is just *temporal* change, from believing 'It's hot here *now*' at *t* to believing 'It's cold here *now*' at *t'*.

What the spatial analogue needs is *simultaneously* believing 'It's hot here' at *s* and 'It's cold here' at *s'*, where *s* is e.g. where my head is and *s'* where my feet are. But this is impossible, because a belief is a property of a *whole* person — like my *shape*, which can't vary across me spatially as it can temporally.

'Thank goodness that's over'

Prior's objection to tenseless theory

If I say 'Thank goodness X is over' after a pain X, what makes 'X is over' true at any *t* is that *t* is later than X. But as '*t* is later than X' is *always* true, I could thank goodness for that at *any* time, e.g. while still in pain, which is absurd. So I must be thanking goodness for something that's *only* a fact *after* X, viz. the tensed fact that X is over (=past).

Tenseless reply

We thank goodness because we *believe* X is over, not because it *is* over, and as pain is self-intimating, we won't believe 'X is over' until after X, which is why we won't thank goodness for it until after X.

McTaggart's argument

McTaggart argues that time must flow for there to be *change* and that without change there is no *time*: i.e. without an A series, there can be no B series, since the B series is supposed to be generated by a temporal *earlier-later* relation. He then argues that time *can't* flow and concludes that time is unreal, i.e. there's not even a B series. He admits there is a series – his 'C series' – generated by a relation that we *think* is temporal and puts events in the same order as the B series: the relation could for example be the *hotter-cooler* relation, if everything was always cooling.

Hardly any philosophers explicitly accept both parts of McTaggart's argument; though many B theorists agree with him in substance by not taking temporal variation to be change in any sense in which spatial variation isn't, which for McTaggart would be to admit that what they call 'time' doesn't deserve the name.

Many philosophers agree with McTaggart that real change needs the flow of time; but few accept his argument that time *cannot* flow because the concept of an A series contains a contradiction.

McTaggart's argument against tenses

The initial argument

Past (P), present (N) and future (F) are *incompatible* properties, yet all events must have *all* of them, which they can't.

Reply

Nothing has more than one of these incompatible properties *at the same time*. Thus if an event *e* is N *now*, it isn't P or F *now*. It *will* be P, but won't then be N or F; and it *was* F, but wasn't then N or P. That is, *e*'s tensed properties are not really P, N and F, but NN, FP and PF, which *are* compatible with each other.

Retort

If NN, FP and PF exist, so do PP (was past), PN (was present), NP (is past), NF (is future), FN (will be present), and FF (will be future). Several of these are incompatible, yet every event has to have them all, which is impossible.

Regress

But no event is (e.g.) PP and FF at the same time ... But to distinguish the A times when *e* has these incompatible properties just generates more complex properties – FPP, PFF etc., – not all of which are compatible; and so on. McTaggart and his supporters say this regress is vicious; his opponents deny this.

The type-token argument against tenses

Type-token distinction

Suppose *e* is a race that unknown to me is put off from 2:30 to 4:30. At 3:30 I say it is over, i.e. '*e* is past', and say it again at 5:30. I.e. I produce two *tokens*, *a* and *b*, of the proposition (*type*) '*e* is past'. What gives them their truth values?

Tensed truth makers

(1) Any token of '*e* is past' is made true by the fact that *e* is past. So

- before 4:30, e.g. at 4 pm, when *e* is *not* past, *a* and *b* are both *false*; and
- after 4:30, e.g. at 5 pm, when *e* is past, *a* and *b* are both *true*.

That is, *a* and *b* always share the *same* truth value, which *changes* from *false* to *true* as *e* becomes past: (I) in the table.

Tenseless truth makers

(2) Any token of '*e* is past' is made true by the fact that it is later than *e*. So

- *a* is always *false*, since it is never later than *e*; and
- *b* is always *true*, since it is always later than *e*.

That is, *a* and *b* always have *different* truth values, which never change: (II) in the table.

A series at 4 pm	Past 2:30	Present 3:30	Future 4:30	
			5:30	
<i>e</i> is not past			<i>e</i>	
Tokens of ' <i>e</i> is past'	<i>a</i>		<i>b</i>	
Truth values (I)	False		False	
Truth values (II)	False		True	
A series at 5 pm	Past 3:30	Present 4:30	Future 5:30	
			6:30	
<i>e</i> is past			<i>e</i>	
Tokens of ' <i>e</i> is past'	<i>a</i>		<i>b</i>	
Truth values (I)	True		True	
Truth values (II)	False		True	

Which is right?

The truth makers of tensed tokens

Truth values of tensed propositions and their tokens

Are the truth values of tokens *a* and *b* of '*e* is past' fixed by

- (I) the truth value this proposition (*type*) has *now*, or
- (II) its truth values at the A times at which *a* and *b* occur?

If you recall *yesterday's* weather report saying 'It's cold today', will you

- (I) reject that token as false if it's not cold *today*, or
- (II) accept it as true if you think it was cold *yesterday*?

Personal and spatial analogues

If I say 'I'm cold', will you

- (I) reject that token as false if *you* are not cold, or
- (II) accept it as true if you think *I* am cold?

If I phone from *elsewhere* and say 'It's cold here', will you

- (I) reject that token as false if it is not cold where *you* are, or
- (II) accept it as true if you think it is cold where *I* am?

(II) seems right in all three cases. Can believers in tenses accept this?

Truth makers for tokens of tensed propositions

(3) Any token of '*e* is past' will be made true by the fact that it is less past or more future than *e*.

This gives *a* and *b* the right truth values (II): i.e.

- *a* is always *false*, because it is always more past or less future than *e*, and
- *b* is always *true*, because it is always less past or more future than *e*.

But as being *less past or more future* than *e* is just being *later* than *e*, (3) is identical with

(2) Any token of '*e* is past' is made true by the fact that it is later than *e*.

	← Earlier	3:30	4:30	5:30	Later →
B series			<i>e</i>		
Tokens of ' <i>e</i> is past'		<i>a</i>		<i>b</i>	
Truth values		False		True	

Tensed facts are not what make tensed tokens true or false: since the truth values of *a* and *b* are independent of where they and *e* are in the A series; and similarly in all other cases. From this we may infer at least that

- as the only reason to believe in tensed facts is as truth makers, we have no reason to believe in them; and even that
- as tensed facts are truth makers by definition, if they aren't truth makers, they don't exist.

Tensed facts, tokens and McTaggart

The single tensed fact that *e* is past can only make true the single proposition (type) '*e* is past': at no time can it give its tokens *a* and *b* different truth values. But they do have different truth values: *a* is always false and *b* is always true. So the fact that *e* is past must both always *exist* – to make *b* always true – and always *not exist* – to make *a* always false. But as nothing can both always exist and always not exist, there can be no such fact. This is a special case of McTaggart's contradiction: *e* must both always have and always lack the property of being past. But as *e* must be both *always* past and *always* not past, McTaggart's opponents cannot remove the contradiction by making *e* past and not past at different times.