Pseudo-Introduction

Questions about time have long been among the most discussed and most perplexing questions in philosophy. What is the nature of time? Is change a necessary feature of time? Is the passage of time from past to future real, or an illusion? As long as these questions have been asked, they have been at the center of major unresolved debates. And as science and philosophy have gradually become separate, disputes about topics which, like time, are central to the sciences but nevertheless raise serious metaphysical questions, have served to highlight the boundaries between science and metaphysics.

Chapter 2: McTaggart’s Paradox and the A- and B-Theories of Time

One of the most contentious and productive disputes in contemporary philosophy of time is due in part to the work of the idealist J. M. E. McTaggart, who by entertaining the questions above developed a distinction between two views of time which has since become perhaps the primary divide among contemporary philosophers of time.

McTaggart’s Argument

McTaggart (1908) describes two distinct ways of conceiving of time, which he calls “the A-series” and “the B-series”:

A-series: “the series of positions running from the far past through the near past to the present, and then from the present to the near future and the far future.”

B-series: “the series of positions which runs from earlier to later.”

The A-series, in other words, is a temporal series in which every moment is either past, present, or future, while the B-series is one in which each moment is either earlier or later than each other moment. McTaggart notes that while we regularly use both concepts on a practical basis, an interesting metaphysical question can be raised: is time more fundamentally an A-series or a B-series? Are the A-properties past, present and future ontologically dependent on the B-properties earlier and later, or vice versa?

McTaggart also considers change to be an essential feature of time:
It would, I suppose, be universally admitted that time involves change. A particular thing, indeed, may exist unchanged through any amount of time. But when we ask what we mean by saying that there were different moments of time, or a certain duration of time, through which the thing was the same, we find that we mean that it remained the same while other things were changing. A universe in which nothing whatever changed... would be a timeless universe.

Since facts about the B-series are eternal ("if M is ever earlier than N, it is always earlier"), argues McTaggart, it involves no change, and thus cannot be an account of time. Facts about the A-series, on the other hand, are always changing ("from future to present, and from present to past"). For this reason, he argues, a proper account of time must be an account of the A-series.

But he then identifies an apparent contradiction in the A-series from which he sees no escape:

Past, present, and future are incompatible determinations. Every event must be one or the other, but no event can be more than one. This is essential to the meaning of the terms... The characteristics, therefore, are incompatible. 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... 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. But this explanation involves a vicious circle. For it assumes the existence of time in order to account for the way in which moments are past, present and future. Time then must be pre-supposed to account for the A series. But we have already seen that the A series has to be assumed in order to account for time. Accordingly the A series has to be pre-supposed in order to account for the A series. And this is clearly a vicious circle.

Faced with a contradiction in one direction and an infinite explanatory regress in the other, McTaggart concludes that there simply is no consistent account of time: since the B-series is constructed based on
temporal relations (‘earlier’ and ‘later’ are relations which can only hold between events or positions in time), and the existence of time is dependent on the existence of the A-series, an inconsistent notion, the B-series too must be inconsistent. Therefore, he concludes, time itself is unreal.

What then, if not the existence of an A-series or a B-series, is responsible for our perception of time? “It is possible…” says McTaggart, “that the realities which we perceive as events in a time-series do really form a non-temporal series. It is also possible, so far as we have yet gone, that they do not form such a series, and that they are in reality no more a series than they are temporal. But I think—though I have no room to go into the question here—that the former view… is the more probable.”

While McTaggart’s radical conclusion about the unreality of time will not directly concern us here, the distinction between the A-series and the B-series and the alleged inconsistency in the A-series (henceforth known as “McTaggart’s paradox”) have become central to some of the most active debates in philosophy of time. Owing to the centrality of time to both philosophy and science, many of these debates have come to involve frequent appeals to science—in particular, appeals to physical theories of time and semantic theories of temporal language.

The A-Theory and the B-Theory

The crucial questions raised by McTaggart’s work are these: (1) Is change something that can be described statically, e.g. in terms of a B-series? (2) Is change, however construed, a necessary feature of time? (3) Are (A-)properties of time like past, present and future ontologically dependent on (B-)properties like before and after, or vice versa? (4) Is the A-series consistent? (5) Is time real, or an illusion?

These questions cannot in general be answered independently of each other. For example, if we answer (2) that change is a necessary feature of time and answer (1) that change cannot be accounted for by a static B-series description, we are likely to answer (3) that A-properties are ontologically dependent on B-properties.

If we further answer (4) that the A-series is contradictory, we are left with little choice but to answer (5) that time is unreal. This is exactly McTaggart’s position.

Relatively few philosophers ever get as far as (5)—very few seem even willing to consider denying the reality of time, though there are some notable exceptions: McTaggart (1908) mentions Spinoza, Kant, Hegel, and Schopenhauer, for example—but questions (1)–(4) have enjoyed great popularity. Question (3) has probably received the most direct attention, generating a major divide among philosophers of time between those who
answer that A-properties are ontologically dependent on B-properties ("A-theorists"), and those who answer the opposite ("B-theorists"). Debate between A-theorists and B-theorists has become increasingly active in the last several decades, especially as alleged presumptions and consequences of each view are identified in areas outside of philosophy. Let us now examine the characteristic views of each group and how their answers to (3) influence and are influenced by their answers to (1), (2) and (4).

Like McTaggart, contemporary A-theorists typically hold that certain aspects of reality or of our experience cannot be accounted for without the postulation of an A-series. But unlike him, they maintain that the notion of an A-series is not inconsistent. Contemporary B-theorists, on the other hand, typically hold that all aspects of reality and of our experience can be accounted for by the existence of a B-series alone. Unlike McTaggart, they maintain that the B-series is genuinely temporal yet not ontologically dependent on the A-series and that an account of time as a B-series can provide a satisfactory account of change.

For instance, B-theorists generally hold that all facts which appear to involve A-series properties can be reduced to facts involving only B-series properties: *the meeting ended five hours ago* is reducible to *the end of the meeting is [tenseless] five hours earlier than the time of this statement*. And according to the typical B-theorist (for example Russell 1903), for something to change is simply “for it to be in a certain state at one time and not in that state at a later time” (LePoidevin 1998). The B-theorist’s position is well-supported by McTaggart’s paradox, the burden of resolving which is generally considered to fall on the A-theorist.

One response to the paradox from the A-theorists, due to A.N. Prior and sometimes called “taking tense seriously,” is to claim that the tensed expressions which McTaggart claims begin an infinite regress (e.g., “If it is present, it has been future and will be past”) don’t actually involve reference to past and future times, but are rather primitive and unanalyzable—true or false simply, not in virtue of facts about any series, temporal or otherwise. But B-theorists are rarely satisfied with this response: to deny tensed verbs their temporal meanings, thus relinquishing so-called “truth value links”\(^1\), is perhaps to deny the most important feature of tense.

\(^1\) Ludlow (1999, p. 148):

> It can be held that there are important truth-value links between statements about the past and statements about the present, and that... A-theorists... must provide some alternative account of these links. For example, we routinely make inferences like (2).

\[\text{(2)}\]

\[\text{I am hungry.}\]

Next Tuesday it will be the case that I was hungry.

On a B-theory semantic theory... it is clear how this sort of inference can be made. If I am hungry now, then there is a time \(t = \text{now}\) such that I am hungry at \(t\). But then for any date \(t'\) later than \(t\) it will be true at \(t'\) that I was hungry. Since next Tuesday is later than \(t\), next Tuesday it will be true that I was hungry.

The A-theorist, on the other hand, will need to articulate alternative... truth-value links that can be drawn on for these inferences.
Moreover, there is an alleged incompatibility of the A-theory of time with physics. According to special relativity, whether two events are observed to be simultaneous or not depends on the inertial (non-accelerated) reference frame in which the observation is made. Two spatially separated events \( e_1 \) and \( e_2 \) observed to be simultaneous by an observer \( O \) will be observed as non-simultaneous by another observer \( O' \) moving at a high speed relative to \( O \). For example, if \( O' \) is moving from the direction of \( e_2 \) from \( e_1 \), he will observe \( e_1 \) to happen after \( e_2 \); if he is moving in the direction of \( e_1 \) from \( e_2 \), he will observe the opposite. If special relativity is true, then there is no such thing as absolute simultaneity (Sklar 1977), and thus there can be no objective facts about the A-properties of events (\( e_1 \) may be present for \( O \) and future for \( O' \), or present for \( O' \) and past for \( O \)), and hence no objective facts about the A-series (Markosian 2009). Since special relativity is considered to be well-confirmed (Sklar 1977), the A-theorist must reject or reinterpret it, both difficult projects requiring extensive justification.

The small but not insignificant group of A-theorists who deny reality to past or future events (or both) face an especially serious challenge if they accept special relativity. “Growing universe theorists” like C. D. Broad, who deny reality to the future while maintaining the reality of the past and present, must accept “the relativization of existence”—that what exists at a given time is relative to the inertial reference frame with respect to which existence is being determined, a decidedly extreme view. “Presentists” like A. N. Prior, William Lane Craig and Peter Ludlow, who deny reality to both past and future events, face a yet more extreme version of the relativization of existence. (Prior denies special relativity, Craig promotes a reinterpretation of the theory which doesn’t entail the loss of absolute simultaneity, and Ludlow simply accepts the relativization of existence.)

Physical considerations aside, defenses of the A-theory, often formulated as charges of inadequacy against the B-theory, have frequently involved appeals to semantic phenomena. Consider a standard objection to the B-theory due to Prior (1959). Prior argues that the content of a statement like “Thank goodness that’s over,” uttered upon the conclusion of something unpleasant, is impossible to convey using only B-series facts. According to Prior, to do so would be to give it a meaning like *Thank goodness the date of the culmination of that thing is Friday, June 15, 1954*, a fact about which the utterer could be totally impartial—if it was ever true, it was always true—but we “thank goodness” only when such culminations become *present*. According to the A-theorist, the postulation of an A-series is necessary to characterize the content of this and other tensed utterances.

B-theorists have offered two main responses to Prior’s objection. The first, typically associated with Hans Reichenbach, Michael Dummett and D. C. Williams (among others), is to adopt a so-called “token-reflexive”
theory of meaning in which the meaning of any temporal indexical expression ("now," "soon," tensed verbs, etc.) makes reference to the utterance event itself: for example, an utterance \( u \) of "That's over" is true iff \( that \text{ culminates [tenseless] at time } t \text{ earlier than the time of } u \). The presence of \( u \) in the truth conditions for temporal indexical sentences is supposed to distinguish their meanings from those of non-indexical sentences: an utterance \( u \) of "The date of the culmination of that thing is Friday, June 15, 1954" is true iff \( the \text{ date of the culmination of that thing is [tenseless] Friday, June 15, 1954} \). While an utterer might be completely indifferent to the fact that the unpleasant event culminated at a time prior to June 15, 1954, he may not be indifferent to the token-reflexive fact that it culminated prior to his utterance.

A-theorists, however, have noted that such a token-reflexive semantics gives counterintuitive meanings to certain modal expressions about utterance acts. For instance, a token-reflexive semantics will never allow utterances like "There are no utterances" to be true: an utterance \( u \) at time \( t \) of "There are no utterances" is true iff \( there \text{ are no utterances at time } t, \text{ the time of utterance } u \). Since the truth conditions here can never obtain, then the sentence is necessarily false. But, A-theorists argue, it is intuitively possible that there were never any utterances (for example, if no organisms capable of verbal expression ever evolved). Thus, according to the A-theorists, the B-theorist's attempt to account for indexicality via token-reflexivity is inadequate.

The B-theorists' next response, sometimes called "the new B-theory" and prompted largely by the objection above, is to admit "that tense is indispensable, and that indeed we rely on it to explain our actions" (Ludlow, p. 95, characterizing the views in Mellor 1981), but to maintain that tense is an "extra-semantic" and sub-metaphysical phenomenon—in other words, "The date of the culmination of that thing is Friday, June 15, 1954" and "That's over" can have identical meanings, corresponding to identical facts about the world, but knowing or believing one can have very different effects on our experience and behavior from knowing or believing the other. The differences, argue the "new" B-theorists (who include D. H. Mellor, Murray McBeath, Nathan Oaklander, David Lewis and Robin LePoidevin) ought to be explained in a theory of, e.g., belief and knowledge, in psychology perhaps, and ignored by semanticists and metaphysicians both.

The new B-theory position characterizes much of contemporary semantics, where it is often simply taken for granted that the ideal semantic theory will, like other scientific theories, be stated tenselessly, and that any differences between the effects on behavior of utterances with temporal indexicals and those of utterances without them should be accounted for elsewhere. Lepore & Ludwig, before providing their "Outline for a Truth-Conditional Semantics for Tense" (2003), briefly motivate the first consideration:

(1) ‘I am tired’ in L means that I am tired.
(2) ‘I am tired’ in L is true iff I am tired.

But (1) and (2) express nothing unless relativized to a context of utterance, and what they express in a context depends on who utters them and the time of utterance. This creates two related difficulties. First, theorists employing identical adequacy criteria will arrive at nonequivalent theories, since they will express different propositions by the sentences they use. Second, no one will give the correct account of the meanings or truth conditions of sentences with context-sensitive elements. Were we each to assert (1), one of us would assert that ‘I am tired’ means that Ludwig is tired at such and such a time, while the other would assert that it means that Lepore is tired at such and such a time. But ‘I am tired’ means neither.

A semantics for a language should be couched in a context-insensitive metalanguage. We want theories that any inquirer can reach by meeting generally agreed upon theoretical constraints and that can be used to express the same thing in every context. This requires metalanguage expressions, including semantic predicates, to be untensed.

[Can I find any comments from semanticists about the proper place for the account of the alleged differences?]

But A-theorists, despite being a minority among philosophers and an extreme minority among scientists, continue to argue for tensed reformulation both of metaphysics and of semantic and other scientific theories. Because time plays a crucial role in the physical sciences, and because tensed language is necessary to formulate metaphysical questions about time like the ones McTaggart raised, physics and semantics tend to be the sciences most frequently nominated for reformulation. Alongside proposals for A-theoretical interpretations of special relativity (Sklar 1981), stand several arguments for A-theoretical or “tensed” semantic theories, at least one of which (Ludlow 1999) has been a serious attempt to integrate linguistic semantics with an A-theory metaphysics of time.