

THE PROBLEM OF TIME AND CHANGE

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As we ordinarily talk about, think about, and experience the world, time has two aspects. On the one hand, we conceive of time as something that flows or passes from the future to the present and from the present to the past. Thus, for example, the inauguration of the 50th president of the United States is in the relatively distant future, but with the passage of time it will become less and less so and eventually will become present. And then, after its spotlight in the NOW, it will recede into the more and more distant past. To speak of events as moving or flowing through time is to conceive of them as undergoing *temporal becoming*. When viewed in this way, events which are present have a special existential status. Whatever may be the case with regard to the reality or unreality of events in the future and the past, events that are in the present exist with a capital E. If events *in* time (or moments *of* time) are conceived in terms of the concepts of past, present and future, or by means of the tenses, then they form what McTaggart called the A-series (from which the name "A-theory" of time is derived). There is, of course, another way in which we speak, experience and conceive of time. We experience events in time as occurring in succession, one after another, and as simultaneous with other events. For example, it is natural for a parent to tell a child that "You cannot go out *before* you do your homework," or "You can watch TV only *after* you clean your room," or "You must go to bed at (i.e., simultaneous with) 10 o'clock." When viewed in this way, events

in various different temporal relations to each other but no one event, or set of events, is singled out as having the property of being present or as occurring NOW. Indeed, from the perspective of tenseless earlier and later relations no event is past, present or future. When events in time (or moments *of* time) are ordered by means of the concepts earlier, later and simultaneity, they form what McTaggart called the B-series (from which the name "B-theory" of time is derived).

One of the most hotly contested issues in metaphysics today concerns the debate between those who hold the tensed or A-theory of time, those who hold the tenseless or B-theory of time, and those who hold a hybrid A-B theory of time. The debate between these three theories concerns the question of whether the ultimate metaphysical nature of time is to be understood in terms of temporal becoming, temporal relations or both temporal becoming and temporal relations. The primary purpose of this essay is to explain what the dispute between these three theories of time involves and to indicate why my sympathies lie with the B-theory. I shall proceed by first discussing the form the debate took for most of the twentieth century and then I will turn to the present state of the controversy. In the final section I will mention some outstanding issues that still need to be resolved by each camp, if they are to gain the allegiance of supporters.

I

The issue between A and B-theorists concerns their different answers to the question: "What is there in reality in virtue of which statements, which record the facts of temporal becoming and temporal relations, are true?" For the greater part of the twentieth century, the debate between the two views has focused on temporal language. Proponents of the A-theory have argued that statements about temporal relations between and among events could be translated without loss of meaning by statements that record the facts of temporal becoming, and that, therefore, temporal becoming is more fundamental to the metaphysical nature of time than temporal relations. Conversely, advocates of the B-theory used to argue that statements about the position of events in the A-series could be translated or defined by statements about temporal relations between events, and

that, therefore, temporal relations are more fundamental to the metaphysical nature of time than temporal becoming.

Unfortunately, all attempts to define or translate "earlier" and "later" in terms of "past," "present," and "future" or vice versa, have failed. For example, if we try to define

"*a* is earlier than *b*"

as

"*a* is past and *b* is present or *a* is present and *b* is future or *a* is past and *b* is future"

then we run into the difficulty that such an analysis cannot account for *a* being earlier than *b* when *a* and *b* are both future or both past.

McTaggart's reduction of B-statements to A-statements fares no better. He says,

The term P is earlier than the term Q, if it is ever past while Q is present, or present while Q is future (McTaggart, 1927, 271).

The problem with this account is that "while" is a temporal notion and thus, McTaggart's use of the term implicitly reintroduces the notion of time he sought to eliminate. For, to take the first disjunct, "P is past while Q is present" implicitly asserts that "P is past at t_1 and "Q is future at t_1 and that certainly does imply that "P is earlier than Q," but "is past at t_1 and "is present at t_1 means the same as "is earlier than t_1 and "is *simultaneous with* t_1 " respectively. Consequently, McTaggart's analysis is implicitly circular. More recent analyses of the relation of temporal priority in terms of tensed concepts have been offered but it appears that none succeed in avoiding the implicit use of the concept they intended to analyze.¹

The attempt at a linguistic reduction of tensed discourse and the concepts of past, present and future in terms of tenseless discourse and the concepts of earlier, later and simultaneity has proved to be just as futile. The reason for this is clear. It is part of the meaning of sentences which reflect temporal becoming that they change their truth

¹ See, for example, Schlesinger (1980), Gale (1968), Sellars, (1962) and Prior (1968). For criticisms of these attempts see Tooley (1997), 159-174.

value with the passage of time. For example, a token (or instance) of the sentence type "I will be celebrating my 53rd birthday in the near future" is true today, on December 10, 1997, but in 6 months another token of that sentence will be false. On the other hand, it is part of the meaning of tenseless sentences which express temporal relations between events that different tokens of the same tenseless sentence have the same truth value whenever they are tokened. Thus, for example, the linguistic meaning of the sentence (S) "My 53rd birthday is future" cannot be captured by (V) "My 53rd birthday is later than December 10, 1997" even if (S) is uttered on December 3, 1997, since (V) is always true, whereas on April 21, 1998, (S) is not.

Because of the failure of translational analyses, A and B-theorists have come to reject the criterion of translatability as the crucial factor in determining whether the tensed or tenseless theory gives us the proper description of the nature of temporal reality. The issue that now rages between the various camps in the tensor/detensor debate concerns the truth conditions of statements that reflect temporal becoming and temporal relations?² In this context, truth conditions are truth makers: the basis in reality for those true sentences that record facts about the transitory and temporal relational aspects of time. Thus, the tensor/detensor debate centers around the questions, "What, if anything, do the tenses and our use of temporal concepts reflect about the metaphysical nature of time?" And "What is the ultimate metaphysical foundation of our experience of succession and temporal relations?" Perhaps the best way to understand the differences between the competing A and B-theory responses to these questions is to consider three closely connected problems that motivate them, namely, the problem of change, the direction of time, and the difference between space and time.

II

The problem of change, like all metaphysical problems, arises out of a conflict of intuitions. On the one hand, change requires *sameness*. A

² For articles that discuss the transition from the old to the new tenseless theory of time see Oaklander and Smith (1994), Part I, Paul (1997) and Oaklander (forthcoming).

thing that changes must be one and the same both before and after the change otherwise we have two things with different properties rather than one thing that changes. Surely, there is a difference between one apple that is first green and then red, and two apples one being green, the other being red. In the first case we have change whereas in the second we do not. On the other hand, change requires *difference*. For, if change is to occur then the same apple must be what it is not, since the apple must have a property, such as green, and then have a different and incompatible property, such as red. But how can one thing be the same and different? How can the same apple be both green and red? Clearly, in order to answer that question we need to introduce time, but what must the metaphysical nature of time be in order to explain change without contradiction?

To begin to get a handle on some of the different answers to this question consider three different descriptions of the fact of change.

- (1) The apple is green *before* it is red.
- (2) The apple is green at one time (t_1) and red at another time (t_2).
- (3) The apple *is now* green and *will be* red.

Each of these descriptions of the fact of change introduces a different category or kind of temporal element or entity to avoid the alleged contradiction that gives rise to the problem of change. It seems that we can easily avoid the problem of an apple being red and green by specifying the different *times* at which it has those incompatible properties, but what is time? For the purposes of distinguishing the absolute and relational theories of time on the one hand, and the tensed and tense less theories of time on the other, we will distinguish the different states of affairs that (1)-(3) describe.

On the first analysis time is *relational*, that is, the only intrinsically temporal entities are the temporal *relations* of simultaneity, earlier and later, and change is reflected in the apple's being green occurring *before* the apple is red. On the second alternative time is *absolute*. There are intrinsically temporal *individuals* called "moments" and change is reflected by the apple having different and incompatible properties at (or relative to) different moments of absolute time. On the third alternative time is *tensed*, and change is reflected in the different non-relational temporal properties of *pastness*, *presentness* and

futurity that events acquire and shed. I shall return to the tensed theory below, but first a few words about the absolute-relational controversy.

On the view that time is absolute, time is a substance. That is, time has an existence in its own right, independent of the existence of anything else. On this view, time could exist even if no events are located in time. I exist in time as do you, and the event of my writing this essay exists in time as does the event of your reading it. If those events and every other earlier, later and simultaneous event did not exist, would there still be time? According to the absolute theory of time, the answer is yes. On the relational theory, on the other hand, the answer is no. For the relationist, if there were no events (or things) standing in temporal relations to each other, then time would not exist. Indeed, time simply is the temporal relations of earlier and later between terms (events or things), and a moment of time just is a class of events existing simultaneously with an arbitrarily chosen event.

Thus, the debate over absolute and relational time is, at bottom, a debate about what categories of entity exist. According to the absolute theory, there are temporal *individuals*, whereas for the relationist there are no such entities, but there are temporal *relations*. On each of these alternatives we appear to avoid the problem of change since there is no incompatibility in a single thing exemplifying one property *before* or at a different *moment* from that at which it exemplifies an incompatible property. But does the introduction of temporal relations and/or moments of absolute time really suffice to preserve the fact of change? Defenders of the tensed theory have argued that without the reality of tense temporal individuals and/or temporal relations *alone* are unable to account for the direction of time and change or the difference between space and time.

To see what is involved in these claims, consider a series of experiences in the mental life of an individual. Suppose, for example, that Rose has the experiences (or consciousness) of (A) anticipating a visit to the dentist (B) sitting in the dentist's chair (C) having a tooth extracted and (D) leaving the dentist's office with a feeling of relief that the extraction is over. Clearly, these experiences reflect not only a change, but a change in a definite or *intrinsic direction*. The experiences occur in the sequence (A),(B),(C),(D) and not the other way around. Thus, to account for change we must account for Rose's

changing experiences taking place in the direction from earlier to later (A) to (D) and not from later to earlier (D) to (A). An adequate account of time and change, must be able to account for their *intrinsic direction*.

The direction of time and change is inseparable from another feature of time that needs to be accounted for, namely, the difference between space and time. Temporal relations between events or experiences of the same person are fundamentally asymmetric dyadic (or two-term) relations. If A is earlier than B, then B is not earlier than A, and that is so without explicit or implicit reference to some third term. In this respect, spatial relations differ from temporal relations since the series of points in a spatial series do not have an intrinsic direction from left to right or right to left, unless a third term is specified as a reference point. That is, whether *a* is to the left of *b*, or *b* is to the left of *a* depends on the point of view from which *a* and *b* are viewed, whereas whether E_1 is earlier than E_2 or *vice versa* does not depend on the point of view of anybody or anything.³

This difference between space and time is nicely summarized by C. D. Broad in the following passage that I shall quote at length:

In a linear spatial series there is no asymmetric dyadic relation intrinsic to the series... In the temporal series of experiences, which constitutes a person's mental history there is a genuine dyadic relation which is intrinsic to the series and involves no reference to any term outside the latter. This is the relation "earlier than". It is the fundamental relation here, and *temporal* betweenness is definable in terms of it. In the temporal series there are two intrinsically opposite directions, earlier-to-later and later-to-earlier. In the linear spatial series there is no *intrinsic* direction. If direction is to be introduced, this must be done *extrinsically*, either by reference to motion along the line (and therefore to time),

³ One might claim that since the advent of the special theory of relativity this difference between space and time has evaporated since the temporal relations between events are relative to the frame of reference from which they are viewed. I have two comments on that argument. First, I am dealing with temporal relations between events in a single frame of reference. Second, the *experiences* of a single person through time have an intrinsic direction that is not subject to the relativity of simultaneity.

or by reference to the right and left hands of an external observer, or in some other way. (Broad, 1937, 268-69; my emphasis).

Since there is this difference between time and space, metaphysicians want to know what must temporal (and spatial) relations be like in order to account for it? To raise that question is, however, inseparable from the problem of change. The change of an apple from green to red is a change in a given or intrinsic direction because the apple is *first* green *and then* red from any point of view. To provide a metaphysical explanation of change is tantamount to accounting for a thing having a property *before* it has an incompatible property. Thus, to provide an explanation of change, we need to account for the direction of time, and the difference between space and time.

What, then, is the metaphysical foundation of the difference between a temporal and a spatial series? And what is the difference between the temporal change of the color of an apple and spatial "change" of say, the color of a lawn from being green at one end and brown at the other? The various answers to these questions constitute the basis of the differences between the tensed and tenseless theories of time.

McTaggart and other A-theorists have maintained that whether time is absolute or relational, the B-theory cannot account for *genuine temporal change*, the direction of time, or the difference between space and time. Consider his argument against the claim that the relational theory (containing B-series facts of the sort reflected by (1)), does not adequately represent change. He reasons that time involves change and therefore if the B-series alone is to constitute time (as the tenseless theory maintains) then it too must involve change. But, he continues, there is nothing in the B-series which changes, that is, there is nothing which remains the same while having a property and then losing it. Since sentences which describe temporal relations between events are always true, it follows, according to McTaggart, that events in the B-series always exist and so do not change by coming into existence and going out of existence. Nor do events in the B-series change their relations to each other. Consequently, if the B-series is a time-series, then its terms (events) must exemplify the temporal characteristics of pastness, presentness and futurity and change with respect to them as

time passes. In other words, time (temporal relations) and change require an A-series.

McTaggart believes the above argument holds even if we enrich our ontology with temporal individuals or moments of absolute time, and describe the fact of change by sentences like (2). For even if the apple is green at t_1 and red at t_2 , there is still nothing about either of those facts that changes. In reference to a poker that is hot at one time and cold at another, McTaggart makes this point against tenseless absolute time and change in the following passage:

It is always a quality of that poker that it is one which is hot on that particular Monday. And it is always a quality of that poker that it is one which is not hot at any other time. Both these qualities are true of it at any time—the time when it is hot and the time when it is cold. And therefore it seems to be erroneous to say that there is any change in the poker. (McTaggart, 1927, 15).

Thus, if (2) is to reflect the fact of change then something more is needed: the apple's being green and the apple's being red (as well as the times at which those events occur) must themselves change from *being future* to *being present* to *being past*.

McTaggart's argument against absolute and relational (tenseless) time can also be expressed by claiming that a series whose terms stand in unchanging relations, but do not have A-characteristics, is not a *temporal* series. For, if a series of terms does not have A-characteristics then it does not have a direction, and without a direction the series is indistinguishable from an unchanging *spatial* series. Thus, McTaggart concludes that if we remove the A-series from time, then there cannot be a series of events standing in temporal relations because it is an A-series, or more accurately, a series of A-series, that "makes" or "generates" a B-series out of a non-temporal (C-) series. In other words, on McTaggart's view, the only transitive asymmetrical relations that exist are non-temporal, and it is the becoming of events, that is, the changing of events from being in the future, to being in the present, to being in the past, that generates *temporal* relations. In short, on McTaggart's view, there are no simple unanalyzable temporal relations. Consider the following passage where he expresses the views I have attributed to him:

The meridian of Greenwich passes through a series of degrees of latitude. And we can find two points in this series, S and S', such that the proposition "at S the meridian of Greenwich is within the United Kingdom" is true, while the proposition "at S' the meridian of Greenwich is within the United Kingdom" is false. But no one would say that this gave us change. Why should we say so in the case of the other [B-] series?

Of course there is a satisfactory answer to this question if we are correct in speaking of the other series as a time-series. For where there is time, there is change. But then the whole question is whether it is a time-series. My contention is that if we remove that A series from the *prima facie* nature of time, we are left with a series which is not temporal, and which allows of change no more than a series of latitude does. (McTaggart, 1927, 15).

For McTaggart and others, who hold the tensed theory of time, an ontology (or account of what there is) that recognizes only B-relations and/or moments as intrinsically temporal existents cannot be correct. For such a view cannot account for the direction of time and change, or the difference between space and time.

It is not my intention in this essay to defend the tenseless theory against McTaggart and other critics since I and others have done so elsewhere.⁴ Rather, my aim is to clarify the metaphysical differences that separate the two theories of time and I think I have said enough to draw the following distinction between one version of the tensed theory and the tenseless theory. I suggest that a fundamental difference between A- and B-time is that on the B-theory *there are*, whereas on the pure A-theory *there are not, primitive temporal relations*. Thus, for some B-theorists such as Russell (1915), the early C. D. Broad (1921) and myself (1984, 1998), to name just a few, temporal relations are primitive and unanalyzable relations indefinable in terms of tensed predicates and irreducible to tensed properties. Detensers reject the moving NOW and the monadic property of presentness, but nevertheless maintain that genuine succession exists and that the B-series alone contains the fact of change. On this version

⁴ Cf. Oaklander (1994, 1998) and Mellor (1998).

of B-time, the difference between spatial and temporal relations is an irreducible qualitative difference, and it is a mistake to suppose that if time is the mere succession of events, then the change involved is exactly like the spatial "change" in the color of the lawn one observes as one walks from the front to the back. The relation that distinguishes temporal order is just different from any spatial relation in the same sense that red and green are just different.

In his early detenser period, Broad expressed the primacy of temporal relations in the following way:

Temporal characteristics are among the most fundamental in the objects of our experience, and therefore cannot be defined. We must start by admitting that we can in certain cases judge that one experienced event is later than another, in the same immediate way as we can judge that one seen object is to the right of another ... On these relations of before and after, which we immediately recognize, all further knowledge of time is built. (Broad, 1921, 334).

I should note, however, that some B-theorists do not (and perhaps need not), construe the earlier/later relations as primitive. Detensers such as Grünbaum (1963), Mellor (1998) and Le Poidevin (1992), maintain that temporal relations are definable in terms of causal relations and the direction of time and change is grounded in the direction of causality (so that A is earlier than B if and only if A causes B). For these philosophers the crucial feature of B-time is not that B-relations are primitive or irreducible, but that they cannot be reduced to A-properties.

On the tenseless theory, tense is not an objective feature of reality, since the B-series of items (events, things, or moments) standing in temporal relations are necessary and sufficient to account for the direction of time and change and the difference between space and time. Although there are variations of the tenseless theory, the common theme is that facts recorded by sentences such as (1) and/or (2) are not reducible to more basic facts about events coming into and going out of existence, or events exemplifying non-relational temporal properties. Furthermore, the detenser maintains that events or things are located at the time they are with the properties they have regardless

of what time it is. This does not mean that tenselessly existing events, "already" exist, or exist at all times, much less that they exist outside of time. The "permanent" or eternal truth of statements that state that two events are temporally related does not imply the permanent or eternal existence of events, but only that statements that express tenseless truths do not change their truth value.

For some A-theorists, on the other hand, temporal relations *are* analyzable in terms of A-properties or tensed facts so that if time is real-if there is *genuine succession-then* the ontological ground of that succession must be the non-relational temporal properties exemplified by events and moments of time, if there are moments of time. A theory that rejects temporal relations as the foundation of the truth of B-statements, and posits temporal properties or tensed facts as their ground, I shall call a "pure" A-theory.

McTaggart argues, however, that if we accept the pure A-theory and claim that temporal relations are definable or analyzable in terms of the changing temporal properties of events or moments, then we are faced with the apparent contradiction of an event having incompatible properties, and the attempt to remove that difficulty by appealing to time leads to a vicious circularity or a vicious infinite regress. The argument, which is known as McTaggart's Paradox, may be stated simply as follows: If events move through time from the future to the present to the past, then every event in time must *be* past, present, and future. However, past, present, and future are incompatible properties; if an event is present, then it is not past or future, and if it is past, it is not present and future, and if it is future, it is not present or past. Thus, the existence of temporal becoming entails a contradiction-that every event both is and is not past, present, future-and so, assuming that real time implies temporal becoming, time is unreal. McTaggart was aware of course that the contradiction appears to have an obvious resolution if we specify the various *times* at which events have these incompatible temporal properties. Thus, instead of saying that, for example, event E is past, present and future, we should say that E is past at time t_3 , present at time t_2 , and future at time t_1 . But McTaggart claims that to introduce time in this way (or by saying that E is present before E is past) involves a vicious circle. It assumes time, either in the form of a B-series of moments (t_1 is earlier

than t_2) or in the form of second-order events (E's being future is earlier than E's being present), in order to explain the possibility of an A-series and temporal passage. But, given his earlier reasoning, in order for there to be a B-series at all, we must assume the existence of an A-series.

Furthermore, the introduction of time in the form of moments or temporal relations is self-defeating, since it does away with the fact of change that the A-series and temporal becoming sought to capture. This becomes clear when we recognize that on the tensed theory of time, "Event E is in the future" expresses a proposition that changes its truth-value with the passage of time, whereas "Event E is future at t_1 " has an unchanging truth-value, meaning no more and no less than "Event E is later than t_1 ."

Of course, we could reintroduce time and change into reality by subjecting the times, or moments, at which events are past, present and future to a change in their transitory temporal properties. That is, we could say that E is present at t_2 and that t_2 is past, present and future; that E is past at t_3 and that t_3 is past, present and future; and so on. Indeed, attributing different A-characteristics to moments is necessary since, if t_1 , t_2 , and t_3 are genuinely *temporal* entities, then they must be terms in a changing A-series. But unfortunately, with that move, the contradiction in temporal predication rears its ugly head once again, this time with respect to moments, not events. It is obvious, according to McTaggart, that the appeal to time to explain how moments can have incompatible temporal properties is just another step in an infinite chain that fails to remove the paradox with which we began. Thus, he concludes, whether we stop at a contradiction or at the denial of genuine (A-series) change, time and change are unreal.

McTaggart's argument for the unreality of time has been the subject of considerable debate.⁵ B-theorists believe it is valid and use it as a *reductio ad absurdum* of the reality of tense. Defenders of the pure A-theory and the hybrid A-B theory (to be discussed below) claim that McTaggart's argument is invalid and guilty of numerous

⁵ For a useful collection of articles on McTaggart's paradox see Oaklander and Smith (1994), Part II.

fallacies. Before considering some prominent A-theory responses to McTaggart, I want to summarize the discussion up to this point.

Recall that the problem of *ordinary* change is as follows: How can one and the same *thing* have incompatible intrinsic (that is, nonrelational) non-temporal properties such as *being straight* and *being bent*? The problem of *temporal* change (or temporal becoming) may be stated analogously: How can one and the same *event* have incompatible intrinsic temporal properties, such as *being future*, *being present* and *being past*? Although both questions are instances of the general problem: How can one and the same *entity* have incompatible properties, there is an important connection between them that their similarity masks, namely, temporal change is claimed by (some) tenses to explain ordinary change. Thus, for (some) tenses, a persisting *thing* *O* changing from straight to bent is explained by claiming that the *events*, *O*'s being straight and *O*'s being bent, each change from being future to being present to being past.

According to McTaggart, however, this explanation of ordinary change involves a vicious circle since precisely the same incompatible properties problem that arose with regard *things* changing their nontemporal properties rears its head with regard to *events* changing their temporal properties. And clearly, the vicious circularity will only turn into a vicious infinite regress if we introduce *absolute moments*, which remain the same through a temporal change of A-properties.

William Lane Craig, a recent defender of the tensed theory, agrees with McTaggart that if we take pastness, presentness and futurity to be non-relational properties then tenses are in "deep trouble" (Craig, 1997, p. 6). On the other hand, Craig's version of the pure A-theory, known as "presentism," purports to avoid both the problem of change and McTaggart's paradox. According to presentism, only the present exists. Thus, it is not the case that, say, *O* is green and *O* is red. Rather, *O was* green at *t*, and *O is* red at *t**. Of course, whether this gambit avoids tenseless facts or is anything more than a verbal solution to a metaphysical problem depends on how the presentist interprets the tenses. Before turning to that question, however, let us consider how Craig responds to the problem of temporal change and McTaggart's paradox. Craig maintains that:

Applying this [the presentist] solution to the case of McTaggart's paradox, we realize that the A-theorist cannot understand grammatical ascriptions of pastness and futurity to events in terms of the literal inherence of properties of pastness and futurity in events. For, on a presentist ontology, such items do not exist and so possess no properties. Such ascriptions must be parsed as asserting that the item in question was or will be F. Only ascriptions of presentness may be taken literally as the possession of an A-determination by some temporal item. The presentist thus adroitly avoids McTaggart's paradox because the only intrinsic tensed properties there are are present-tensed and therefore are compatible (Craig, 1997, 5).

The question I want to consider is simply this: If past and future items do not exist and only ascriptions of presentness may be taken literally as the possession of an A-determination by some temporal item, then how are we to interpret ascriptions "asserting that the item in question *was* or *will be* F"? In other words, what do the tenses "was" and "will be" represent? Indeed, what is the metaphysics of presentism? Unfortunately, what Craig says in response to that issue is obscure. It is dealt with more explicitly, but no more satisfactorily, in a recent paper by Mark Hinchliff (1996).

According to Hinchliff, only the present exists. Given that only the present exists there is no incompatible properties problem. For the only properties a thing has are those it presently has. Thus, we ought not say that the apple is green and red, which is a contradiction, or that it is green at one time and red at another time since that transforms intrinsic properties into relational ones, or that the apple is green before it is red since that implies that non-present events exist. Rather, the only properties a thing has are those which are present and no thing has incompatible properties at present. It is never the case that the apple *is* green and *is* red, but rather it either *was* green and *is* red, or *is* green and *will be* red. The question, however, is what do the words "was" and "will be" mean in this context? Hinchliff claims that:

... the presentist treats the past and future tense inflections of verbs as sentence operators, whose meanings are typically given by rules like the following:

Past Tense 'It was the case that S' is true if and only if it was the case that 'S' is true;

Future Tense 'It will be the case that S' is true if and only if it will be the case that 'S' is true (Hinchliff, 1996, 125-26).

The problem with this understanding of "was" and "will be" in judgments about the past and future is that it is circular, for the notions of "was the case that" and "will be the case that" involve the concepts of past and future, but are left unanalyzed. For that reason, the presentist solution ought not to be viewed as satisfactory.

What is common to a McTaggartian analysis of tense and the presentist analysis is that each attempts to analyze the concept of time without recognizing temporal relations as basic ingredients of reality. A hybrid A-B theory, which countenances *both* monadic temporal properties *and* primitive temporal relations has been recently put forth by Quentin Smith (1993, 1998). It seems, however, that it too is open to serious dialectical difficulties.

According to Smith, the basic fallacy in McTaggart's paradox and all other arguments against the temporal properties of pastness, presentness and futurity is that they treat *tensed* predication as either *timeless* or *simultaneous* predication. Thus, he claims that it is never the case that an event E is (timelessly or simultaneously) past, present and future, but rather

E *is* past, *was* present and *was* (still earlier) future, or E *is* present *was* future and *will be* past or E *is* future and *will be* present and (still later) *will be* past.

Smith's point is well taken, but it certainly is not the last word since we need to understand how the tenses "is now" "was" and "will be" are to be interpreted if we are to understand how such an account is to render temporal becoming and thus ordinary change possible. It is a virtue of Smith's writings that he provides such an account. It is a weakness of his explanation that it does not invalidate McTaggart's conundrum.

Smith maintains that the reality of temporal properties as reflected in his analysis of the tenses implies an infinite regress of inferences of presentness inhering in their own inferences. That is, the correct

analysis of "E is present" is "E is present, and the being present of E is present, and the being present of the being present of E is present, and so on infinitely" (Smith, 1994, 185). He explains this by saying that:

the first conjunct predicates presentness of the event E and each of the remaining conjuncts predicates presentness of a different inherence of presentness; the second conjunct predicates presentness of the inherence₁ of presentness in E, the third conjunct predicates presentness of the inherence₂ of presentness in its inherence in E, and so on. (Smith, 1994, 187).

Similarly, the correct analysis of "E is past" and "E is future" involves the inherence of presentness in an infinite number of inherence relations. Thus, although there is an infinite regress of inherence relations there is no contradiction in the predication of A-properties of events or predication of A-properties of inherence relations. Smith's way out of McTaggart's paradox strikes me as inelegant and phenomenologically false. We are just not acquainted with the infinite regress of inherence relations Smith's theory implies. But even if we set aside these arguably subjective factors, there remain serious dialectical difficulties that mitigate against the acceptance of Smith's theory. I shall mention two.

First, consider the sentence, "Event E will be past." On Smith's analysis, this means that the inherence₁ of pastness in E is such that futurity *now* inheres₂ in it. To state the same analysis somewhat differently, E exemplifies₁ pastness, and exemplification₁ exemplifies₂ futurity, and exemplification₂ exemplifies₃ presentness. The crucial and fatal-move in Smith's analysis is the claim that the inherence₂ of futurity in the inherence₁ of pastness in E, is *present*. For if the second order inherence, or exemplification₂, is *now* present, then it *exists now*. If, however, exemplification₂ *exists now*, then the term, in this case exemplification₁, that exemplifies₂ futurity, must also *exist now*. However, if exemplification₁ exists now, then it must be present. Since, by hypothesis, exemplification₁ is future, it follows that

exemplification₁ is both present and future, or does now exist and does not now exist, and that is a contradiction.⁶ Second, consider the sentence "E is past, and was present and was (still earlier) future." If E was future earlier than E was present, then on Smith's analysis that would imply that, say, being past by two hours *presently* inheres in the inherence of futurity in E *is earlier* than being past by one hour *presently* inheres in the inherence of presentness in E. That, however, implies a contradiction, since Smith maintains both that "the B-relations of earlier and later obtain between two events only if at least one of the events is *not present*" (Smith, 1993, p. 197; emphasis added), and that if "E was future earlier than E was present," is true, then the B-relation of *earlier than* obtains between the *present* inherence of being past by 2 hours...in E, and the *present* inherence of the being past by 1 hour...in E. In other words, on Smith's analysis the temporal relation of earlier than obtains between two events that are present and that is absurd. We have considered a pure A-theory which rejects temporal relations as primitive existents and a hybrid A-B theory that accepts temporal relations *and* temporal properties, but we have found both versions of tensed time wanting. There is one final version of the tensed theory that is worthy of consideration and differs from the versions we have considered so far. On the "open future" theory, as I shall call it, the past and present do exist, but the future does not. On this view, whose most recent exponent is Michael Tooley (1997), there are no tensed properties and there are no primitive temporal relations. Rather, temporal relations (which are analyzed in terms of causal relations), are generated through the coming into existence of tenseless states of affairs and their addition to the sum total of existence. One difficulty that the open future theory must face is that it cannot give an adequate account of judgments about the future. If the future does not exist, then what are we judging when we judge, for example, that "It will rain tomorrow"? Michael Tooley has attempted to get around this difficulty by distinguishing being actual *simpliciter* and being actual as of a certain time. The future is actual *simpliciter* and is

⁶ My criticism of Smith is developed in greater detail in Oaklander (1996). Smith replies to that article in Smith (forthcoming).

part of the sum total of what exists *simpliciter*, but it is not actual as of a time. Thus, judgments about the future can be meaningful, even though, as of a certain moment, what they are about does not exist.

It seems to me, however, that Tooley's response to one difficulty lands him in another. On the one hand, he wants reality to consist of "the mereological union of *all* the states of affairs that are actual as of one time or another" (Tooley, 1997, 153; my emphasis). That is, he wants reality to be the totality of what (tenselessly) exists *simpliciter* so as to make sense of judgments about the future. On the other hand, to allow for the accretion of facts, his view presupposes that the sum total of what exists is different at different times. Unfortunately, Tooley never clearly explains how the sum total of existence can remain the same and have temporal parts that change their existential status. Tooley asserts that the problem of change motivates the debate between tensed and tense less approaches to time (1997, 13), but he does not realize that his own solution simply reraises it. He maintains that the totality exists *simpliciter* and yet new tenseless facts come into existence and are added on to the totality as time passes. But how is this possible? How can the totality exist *simpliciter* and remain the same through a change (as of different times) in the existential status of its temporal parts? I do not think that there is a consistent set of answers to these questions.

There are numerous other versions of the tensed theory of time, but enough has been said to give the reader an indication of why my sympathies lie with the B-theory: In summary, the problems with the A-theory are that it is either metaphysically unenlightening (presentism), susceptible to contradiction (pure and impure A-theory), or does not avoid or resolve the problem of change (the open future theory). If A-theorists are to justify their position, they must provide adequate responses to these difficulties. Of course, the B-theory has issues that it needs to address as well. I shall conclude by mentioning a few of them.

III

First and foremost, an issue that the defender must address is the problem that we have been dealing with throughout, namely, the problem of change. From McTaggart's time until the present,

A-theorists have accused detensers of being unable to account for the fact of change. The argument typically involves two steps. First, tensors argue that a detenser must construe a thing not as an *enduring* entity or continuant which persists through time and change, but as a *perduring* entity or a series or succession of temporal parts with qualitative differences and similarities. Second, tensors then argue that on the view that things persist by perduring, it follows that *nothing really changes* since nothing remains the same while first having a property and then losing it. Each of these steps needs to be confronted by the detenser. Does the tenseless view imply that things are wholes composed of temporal parts, or is the B-theory compatible with (some version of) the view that a thing is a continuant that remains literally the same through time and change? And secondly, if, on the tenseless theory, a thing must be analyzed in terms of a succession of temporal parts or *events*, which themselves do not change, does it follow that *no thing changes*?

There is another range of issues that the B-theorist must address and they concern what may be called the "phenomenology of time," the way time is given to us in thought and experience. We can see how some of these issues readily come to light by considering a passage from Russell's "Mysticism and Logic" (1914) where he discusses the proper attitude toward time in a world without temporal becoming and the flow of time. He says:

The arguments for the contention that time is unreal and that the world of sense is illusory must, I think, be regarded as fallacious. Nevertheless there is some sense-easier to feel than to state-in which time is an unimportant and superficial characteristic of reality. Past and future must be acknowledge to be as real as the present, and a certain emancipation from slavery to time is essential to philosophic thought. The importance of time is rather practical than theoretical, rather in relation to our desires than in relation to truth. That this is the case may be seen at once by asking ourselves why our feelings towards the past are so different from our feelings towards the future. The reason for this difference is wholly practical: our wishes can affect the future but not the past, the future is to some extent subject to our power, while the past is unalterably fixed. But every future will someday be past: if we see the past truly, now it must, when it was still future, have been just what

we now see it to be, and what is now future must be just what we shall see it to be when it has become past. The felt difference of quality between past and future, therefore, is not an intrinsic difference, but only a difference in relation to us: to impartial contemplation, it ceases to exist... Whoever wishes to see the world truly, to rise in thought above the tyranny of practical desires, must learn to overcome the difference of attitude towards past and future, and to survey the whole stream of time in one comprehensive vision (Russell, 1914, r eps. (1957), 20-21).

If, as Russell puts it, the tensed distinctions of past, present and future are not intrinsic features or properties of events in time, and all events are real from the point of view of "one comprehensive vision" then tenses will argue that the tenseless theory implies a phenomenological threat to freedom. We experience the future as being an open realm of possibilities, but for the detenser all events are equally real, there being, as Palle Yourgrau has recently put it, "a symmetry of past, present and future with respect to *facticity*" (Yourgrau, 1992, 46). However, if the future is as real as the present, and so already exists or already is a fact, then how can the detenser account for our experience of the role we play in creating the (not yet existing) future? Furthermore, how is the detenser to account for the difference in our cognitive attitudes toward events in the A-series? For example, an unpleasant event that is future is thought of with anxiety or dread whereas the same event that is past is thought of with relief. On the detenser's view, where being future and being past are, in reality, nothing more than being later or being earlier than a given event or time, how can the special attitude we have toward past and future events be explained? Indeed, when, upon seeing a clock read 12 o'clock I come to believe that NOW is the time to go to lunch, this belief seems to make sense only on an A-theoretic ontology. If all I believe at 12 is the tenseless proposition that, say, t "The clock striking 12 o'clock is simultaneous with the time I should go to lunch," it is not clear why I would go to lunch NOW, since that proposition, if it is true at all, is true at all times (including those other than 12 o'clock). Thus, to explain timely action I must also believe,

on the basis of perception, that the clock is NOW striking 12 o'clock; a belief that implies the reality of tense. There have been important detenser responses to this argument, but recent work on the issue indicates that further work needs to be done?⁷

Finally, I want to mention a predicament that George Schlesinger claims the detenser must resolve if the tenseless view is to coincide with our deepest feelings about time. The following long quote is in no need of explanation, although it is certainly in need of a reply. Schlesinger says:

Most detensers agree with Nathan Oaklander that "it is an impression deeply felt by all of us" that time has dynamic, transient or A-properties. However, in reality the passage of time is a myth. How then are we to reconcile appearance with reality? Many detensers readily admit that we don't. Some of them may not go as far as Brian Garrett who claims that our psychological illusion about transience may be "so deep and so fundamental that it is rational even though it does not admit of justification." Still, whether rational or not, for whatever reason, we were made to feel it in our bones. It is, of course not the only instance where the facts are different from the way we strongly feel. However, unlike in other cases where appearance and reality are in conflict, the position of those who claim a conflict in the temporal context is inexplicable. Consider, for instance, individuals afflicted by some psychological maladjustments like claustrophobia, agoraphobia, and the like. In my admittedly limited experience, sufferers with a modicum of intelligence, who fully grasp that in fact their fears have no basis in reality, are prepared to subject themselves to a variety of therapeutical regiments to get rid of their irrational compulsive behavior. The majority of such people succeed partially at least in shaking off their deviant behavior.

Now if detensers are right, and the transient view of time is replete with fallacies and cannot be reconciled with correct reasoning, and if philosophers-who are on the whole very smart in their dealings with the world around them claim to realize that the "impression deeply felt by all of us" that "time's winged

⁷ See, Oaklander and Smith (1994), Part III and Craig (1996).

7 See, Oaklander and Smith (1994), Part III and Craig (1996). "chariot hurrying near" may be good poetry, but an utterly false reflection of reality, don't they try to rid themselves of this "affliction?" It seems inexplicable, that-unlike those who are suffering from different delusions-even the most fanatic detensers have never been known to have lifted a finger to wean themselves from "thanking goodness when the headache is over," or from being any less nostalgic than others about the passing of the good old times. And in general, why is it that none of them are known to have ever done anything to cure themselves of this particular debilitating psychological maladjustment? (Schlesinger, 1998, 5-6)

Clearly, Schlesinger raises important questions that the detenser needs to address.

In this essay I have intended to provide the reader with knowledge of the contemporary state of the tensor/detenser debate *via* a discussion of the problem of change. The tensor/detenser debate is not only interesting in its own right, it also is connected with a range of other issues in metaphysics, the philosophy of language, the philosophy of religion, the philosophy of mind and other areas in philosophy.⁸ Continued work on temporal becoming and temporal relations will undoubtedly contribute to the advancement of philosophical research in these other areas of philosophy, and for that reason, amongst others, it is well worth pursuing.

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⁸ For a discussion of these connections see Smith's "Introduction," to Oaklander and Smith (1994).

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