

## The New Paradox of Temporal Transience

David J. Buller

and

Thomas R. Foster

McTaggart<sup>1</sup> raised a famed paradox regarding the *transientist* conception of time, the idea that the present moves into the future to overtake future events (or, alternatively, that future events move into the present) and past events recede further and further into the past as time goes on. Schlesinger<sup>2</sup> has recently attempted an ingenious transientist solution to McTaggart's paradox. We will argue that Schlesinger's solution to McTaggart's paradox itself gives rise to a new, yet perfectly parallel, paradox which can only be resolved by abandoning the transientist view of time.<sup>3</sup>

McTaggart draws a distinction between two types of temporal statement about events. On the one hand, we speak of events as being in the *past*, in the *present*, and in the *future*; and, on the other hand, we speak of events as occurring *earlier than*, *simultaneous with*, or *later than* one another. The former type of statement locates events within what McTaggart calls the 'A-series' and are, hence, 'A-statements'; whereas the latter type locates events within the 'B-series' and are, hence, 'B-statements'. What is characteristic of A-statements is that they undergo changes in truth value; for example, the statement that some event is future changes truth value when that event becomes present. But B-statements are, if true, always true and, if false, always false. Thus, the notion that time is *dynamic* (the transientist view) is inextricably linked to the A-

series. The idea, here, is that the *now* in the A-series moves along a sequence of events, with the motion of the *now* being from the past toward the future (as in Figure 1).

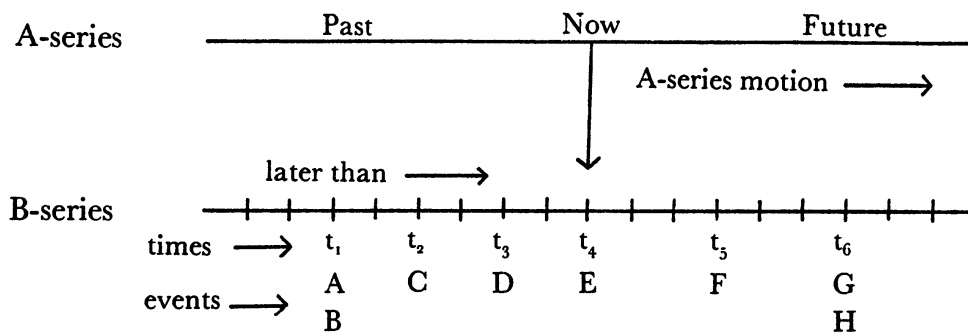
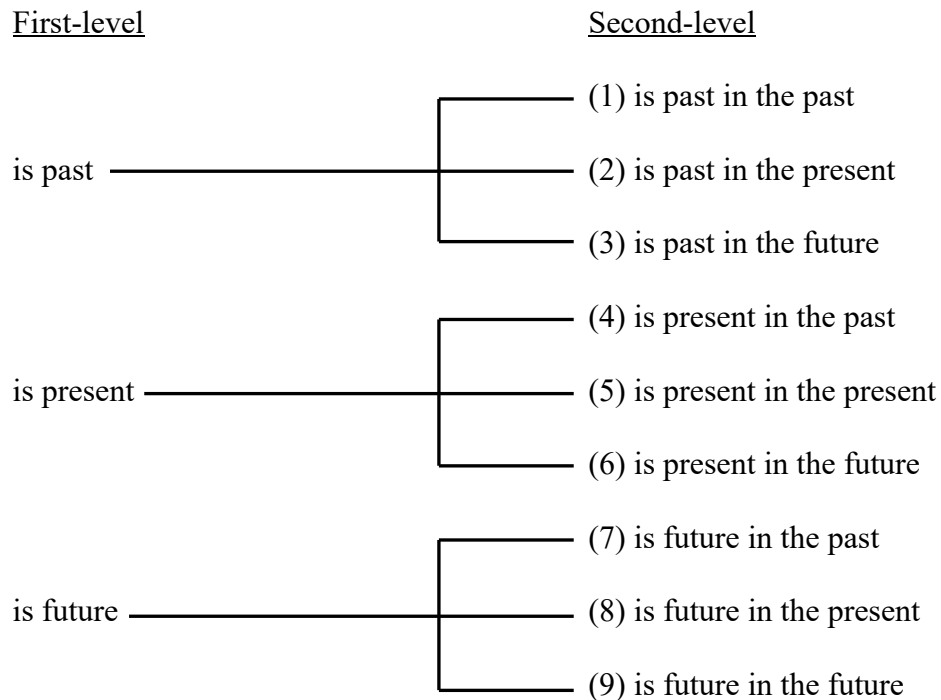


Figure 1

McTaggart generates his paradox by pointing out that the predicates ‘is past’, ‘is present’, and ‘is future’ are incompatible, since ‘x is past’ implies ‘x is neither present nor future’, ‘x is present’ implies ‘x is neither past nor future’, and ‘x is future’ implies ‘x is neither present nor past’. But, McTaggart argues, every event satisfies *all* of these predicates; that is, every event, E, is such that E is past, E is present, and E is future. This, however, generates a contradiction, since if E is present and E is past (and ‘E is past’ implies ‘E is neither present nor future’), it follows that E is both present and not present.

The seemingly obvious response to McTaggart’s paradox is to claim that there is no contradiction here, because E never satisfies all of these predicates *at the same time*. And there are two ways in which one can make this move. The first is to relativize attributions of pastness, presentness, and futurity to different times *in the A-series*. Thus, for some event E which is present, one can claim that E is past *in the future* and that E is future *in the past*. This move does succeed in attributing pastness, presentness, and futurity to E at different times, but in so doing

introduces a set of second-level temporal predicates. So, corresponding to each first-level predicate ('is past', 'is present', 'is future'), there are three second-level predicates as follows:



Now, although (3), (5), and (7) are compatible (and are those which were introduced above to avoid McTaggart's paradox), McTaggart can point out that every event satisfies *every* second-level predicate. And some of these are clearly incompatible: consider, for example, (2), (5), and (8). Thus, this way of attempting to avoid McTaggart's paradox merely shifts the paradox to the second-level predicates which were introduced to resolve the paradox with respect to the first-level predicates. Of course, one could introduce *third-level* predicates (of which there are twenty seven) in a like effort to resolve the paradox with respect to the second-level predicates. But, McTaggart's paradox arises with respect to these predicates as well. Hence, relativizing attributions of pastness, presentness, and futurity to different times *in the A-series* can never

succeed in eliminating the paradox; consequently, this move doesn't constitute a genuine resolution of McTaggart's paradox.

The second way in which to claim that there is no genuine contradiction is to relativize attributions of pastness, presentness, and futurity to different times *in the B-series*. Thus, one can say that E is present at  $t_4$  (in Figure 1), E is past at  $t_n$  (for any time  $t_n$  such that  $n > 4$ ), and E is future at  $t_m$  (for any time  $t_m$  such that  $m < 4$ ). By relativizing the satisfaction of these predicates to particular times in the B-series, however, one avoids McTaggart's paradox only by transforming the original A-statements into B-statements as follows:

<u>A-statement</u>	<u>Translation</u>		<u>B-statement</u>
E is past	E is past at $t_n$	is equivalent to	E is earlier than $t_n$ ( $n > 4$ )
E is present	E is present at $t_4$	is equivalent to	E is simultaneous with $t_4$
E is future	E is future at $t_m$	is equivalent to	E is later than $t_m$ ( $m < 4$ )

This does succeed in avoiding the contradiction which McTaggart derives, since it claims that E is present at  $t_4$  while E is not present at  $t_i$  (for all  $t_i$  such that  $i \neq 4$ ). By avoiding the contradiction in this way, however, one pays the price of denying the reality of the A-series. For the translations of the A-statements (being equivalent to B-statements) are *always* true; thus, since they don't undergo changes in truth value, they are not genuinely unreduced A-statements. Although McTaggart concludes from all this that time is unreal (since he maintains that the A-series is essential to time), some (e.g. Horwich<sup>4</sup>) have been content with this resolution of the paradox, claiming that all McTaggart's paradox shows is that the *A-series* is unreal.

Such a resolution, however, is unsatisfactory to the transientist, who must find some other way of responding to McTaggart's paradox. Thus, a transientist's solution must not only avoid McTaggart's contradiction, but must do so without relativizing the truth of A-statements to particular times in the B-series.

Schlesinger attempts just such a transientist solution. Schlesinger postulates a sequence of worlds which are identical in every respect except for the *moment* which is occupied by the *now*, as in Figure 2, where the heavy bar indicates the position of the *now* in each of the worlds  $W_i$ . Schlesinger's idea is that we should not think of the *now* itself as moving along the sequence of events located in the B-series (as in Figure 1). Rather, in this new model, it is *actuality* which moves from world to world, and its motion is along the A-series in the direction of the future. So, since the *now* occupies moment  $m_n$  in world  $W_n$ , when *actuality* moves from world  $W_{n-1}$  to world  $W_n$ , the events which occur at  $m_n$  become present occurrences. Similarly, when *actuality* moves from  $W_n$  to  $W_{n-1}$ , the events at  $m_n$  become past and the events at  $m_{n+1}$  become present. On this model, what distinguishes A-statements from B-statements isn't that the former *undergo changes* in truth value, while the latter don't; rather, A-statements are those which are true in *only some* of the worlds in the model (in fact, statements attributing *presentness* to an event are true in only a single world), while B-statements are true in every world in the model.

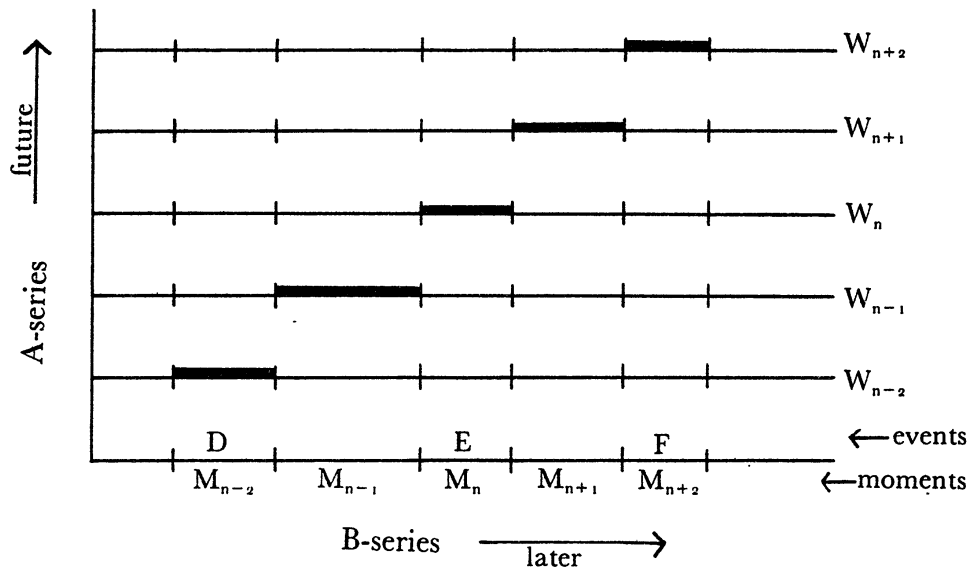


Figure 2

The way in which Schlesinger believes this model can resolve McTaggart's paradox while retaining the transientist view of time is as follows. Rather than relativizing the contradictory 'E is present' and 'E is not present' to *different times*, Schlesinger claims that they should be relativized to *different worlds*. Thus, rather than saying that 'E is present' should be understood as 'E is present at  $m_n$ ' (referring now to Figure 2), it should be understood as 'E is present in  $W_n$ '. To put it another way, Schlesinger argues that we should not understand 'E is present' to be true *at*  $m_n$ , rather we should understand it to be true *in*  $W_n$ . This effects a different translation of the paradoxical A-statements than that considered above. On Schlesinger's view, we get the following translations:

<u>A-statement</u>	<u>Translation</u>
E is past	'E is past' is true in $W_k$ (for all worlds $W_k$ such that $k > n$ )
E is present	'E is present' is true in $W_n$
E is future	'E is future' is true in $W_m$ (for all worlds $W_m$ such that $m < n$ )

Thus, McTaggart's paradox is avoided, since the statements 'E is present' and 'E is not present' are never both true in the same world.

However, a new, yet perfectly parallel, paradox arises as follows. For any world  $W_i$  in Schlesinger's model, by construction of the model,  $W_i$ 's *being actual* is incompatible with any other world's *being actual*; for to say that  $W_i$  is actual is simply to say that no world  $W_k$ , such that  $k \neq i$ , is actual. But, in Schlesinger's model, every world is actual. It follows that every world in the model is both actual and not actual.

Let us run through this argument formally, and a little more slowly, for the sake of perspicuity. Let 'A' be a one-place predicate meaning 'is actual', and let 'w' (with numerical subscripts) be a variable ranging over Schlesinger's worlds. The premises are as follows:

- (i)  $(w_1)(Aw_1 \rightarrow \sim (\exists w_2)[Aw_2 \ \& \ w_1 \neq w_2])$
- (ii)  $(w_1)Aw_1$

If we instantiate both premises to  $W_n$ , by modus ponens we get:

- (iii)  $\sim (\exists w_2)[Aw_2 \ \& \ W_n \neq w_2]$

From (iii) by quantifier exchange, instantiation to  $W_{n+1}$ , and DeMorgan we get:

- (iv)  $\sim AW_{n+1} \vee W_n = W_{n+1}$

However, by construction of Schlesinger's model,  $W_n \neq W_{n+1}$ . Thus, by disjunctive syllogism we get:

- (v)  $\sim AW_{n+1}$

But if we instantiate (ii) to  $W_{n+1}$ , conjoin it with (v), and universally generalize, we get:

- (C)  $(w_1)(Aw_1 \ \& \ \sim Aw_1)$

i.e. every world is both actual and not actual.

There is, of course, an obvious way for Schlesinger to avoid this contradiction. And that is to point out that no two worlds are actual *at the same moment*; for  $W_n$  is actual at  $m_n$ ,  $W_{n+1}$  is actual at  $m_{n+1}$ , and so on. Thus, to avoid the contradiction, Schlesinger need only relativize statements about the actuality of worlds to the moments at which they are actual. Rather than saying, for any world  $W_i$ , that  $W_i$  is actual *simpliciter*, Schlesinger need only say instead ‘ $W_i$  is actual at  $m_i$ ’. This move does succeed in avoiding the contradiction, but in so doing transforms statements about the actuality of worlds into B-statements, i.e. statements which relativize the actuality of worlds to moments in the B-series.

The problem this poses for Schlesinger’s attempted transientist solution to McTaggart’s paradox is as follows. Schlesinger wants to avoid the contradiction which McTaggart derives by relativizing statements about the present to worlds in which they are true. Thus

(P) ‘E is present’

becomes:

(1) ‘E is present’ is true in  $W_n$ .

And

(N) ‘E is not present’

becomes:

(2) ‘E is not present’ is true in every world  $W_i$  such that  $i \neq n$ .

But since what makes (1) true is the fact that the moment at which E occurs is *now* only when  $W_n$  is actual, and since  $W_n$ ’s being actual ensures that the moment at which E occurs is *now*, (1) is equivalent to:

(3) ‘E is present’ is true when  $W_n$  is actual.

But to avoid the above paradox about actuality, (3) becomes:



(4) 'E is present' is true when  $W_n$  is actual and  $W_n$  is actual at  $m_n$

which, with respect to Schlesinger's model, is equivalent to:

(5) 'E is present' is true at  $m_n$ .

And (5) is a paradigmatic B-statement.<sup>5</sup>

There is, though, a possible response to this argument, which is to claim that the move from (3) to (4) is illegitimate.<sup>6</sup> The rationale is that the moment  $m_n$  extends through each of the worlds in Schlesinger's model. Thus, the moment  $m_n$  occurs, for example, in  $W_{n+1}$ . But  $W_n$  isn't actual at the occurrence of  $m_n$  in  $W_{n+1}$ ; the only occurrence of  $m_n$  at which  $W_n$  is actual is that occurrence *which is present*. So, (4) could be replaced with:

(4\*) 'E is present' is true when  $W_n$  is actual and  $W_n$  is actual when  $m_n$  is present.

Again, however, with respect to Schlesinger's model, (4\*) is equivalent to:

(5\*) 'E is present' is true when  $m_n$  is present

which, in turn, is equivalent to:

(6\*) E is present when  $m_n$  is present.

But this latter is equivalent to:

(7\*) E is simultaneous with  $m_n$

which, again, is a paradigmatic B-statement. Now, while it is obvious that (6\*) entails (7\*), it may not be as obvious that (7\*) entails (6\*); so it might be thought that they are in fact not equivalent. But to see that they are, note that (7\*) entails that, no matter whether E and  $m_n$  occur in the past, present, or future, if one of them occurs in the past, present, or future, the other does as well. Consequently, (7\*) does in fact entail:

(8\*) E is past when  $m_n$  is past *and* E is present when  $m_n$  is present *and* E is future when  $m_n$  is future.

And, of course, by simplification, (8\*) entails (6\*). Thus, (6\*) is in fact equivalent to (7\*).

So, Schlesinger avoids McTaggart's paradox by relativizing statements about the present to worlds in which they are true; but this relativization itself generates a precisely parallel paradox, which can be resolved by relativizing the actuality of a world to a moment in the B-series. Consequently, paradox can be avoided by indirectly relativizing statements about the present to the moments in the B-series at which they are true. Once this move is made, however, we no longer have unreduced A-statements, we have B-statements. Thus, Schlesinger's model doesn't actually succeed in providing a *transientist* solution to McTaggart's paradox.

Schlesinger could avoid this consequence, however, by arguing that the A-series in his model is significantly different than the A-series in McTaggart's model; so, the problem that arises with respect to relativizing to the A-series on McTaggart's model wouldn't arise with respect to relativizing to the A-series in his model. Thus, rather than relativizing the actuality of  $W_n$  to a moment (or the *presence* of a moment) in the B-series (namely,  $m_n$ ), Schlesinger could attempt to relativize the actuality of  $W_n$  to *the A-series*, a move which parallels a standard way of attempting to avoid McTaggart's paradox. But, in Schlesinger's A-series, there are no *positions* (as there are in McTaggart's A-series). Consequently, if the actuality of  $W_n$  is to be relativized to Schlesinger's A-series, the relativization must be *relational*. This would proceed as follows. There are two senses of 'before' in Schlesinger's model: a B-series 'before' (which means simply 'earlier than') and an A-series 'before', which is an ordering relation for the sequence of Schlesinger's worlds (Schlesinger 1991, pp. 432 and 439). Making use of the A-series 'before', Schlesinger could point out that  $W_n$  is actual *before*  $W_{n+1}$  is actual. But, of course,  $W_{n-1}$  is actual before  $W_{n+1}$  is actual as well. Thus, if the relativization to the A-series is to be effective in assigning the actuality of  $W_n$  a unique place in the A-series, Schlesinger would have to say

that  $W_n$  is actual *right before*  $W_{n+1}$  is actual, where the *right before* relation would be analyzed as follows:

A world  $W_i$  is *right before* a world  $W_k$  in the A-series if and only if (a)  $W_i$  is before  $W_k$  in the A-series and (b) there is no world  $W_m$  such that  $W_m$  is before  $W_k$  in the A-series and  $W_i$  is before  $W_m$  in the A-series.<sup>7</sup>

Employing this A-series *right before* relation, Schlesinger could resist the move from (3) to (4\*) made above and, instead, say that the paradox of actuality which arises with respect to (3) should be resolved by:

(4\*\*) 'E is present' is true when  $W_n$  is actual and  $W_n$  is actual right before  $W_{n+1}$  is actual.

Again, however, with respect to Schlesinger's model, (4\*\*) is equivalent to:

(5\*\*) 'E is present' is true right before  $W_{n+1}$  is actual.

And the paradox of actuality arises again with respect to (5\*\*), for  $W_{n+1}$  is both actual and not actual. Schlesinger could, of course, point out that  $W_{n+1}$  is actual right before  $W_{n+2}$  is actual.

So, he could resolve the paradox with respect to (5\*\*) by introducing:

(6\*\*) 'E is present' is true right before  $W_{n+1}$  is actual and  $W_{n+1}$  is actual right before  $W_{n+2}$  is actual.

But, of course, this merely transplants the paradox to the actuality of  $W_{n+2}$ ; it doesn't resolve the paradox.

Therefore, if Schlesinger relativizes the actuality of the worlds within his model to particular moments in the B-series, he hasn't succeeded in providing a *transientist* solution to McTaggart's paradox. And if he relativizes the actuality of the worlds within his model to the A-

series, he hasn't provided a solution to McTaggart's paradox at all, since a new, yet perfectly parallel, paradox appears within the purported solution which remains unresolved.<sup>8</sup>

## Notes

1. J. M. E. McTaggart, *The Nature of Existence*, Volume II (Cambridge: Cambridge University Press, 1927), Book V, Chapter 33.
2. George N. Schlesinger, 'E Pur Si Muove', *Philosophical Quarterly*, 41 (1991), pp. 427-441.
3. A view similar to Schlesinger's has been developed by John Bigelow, 'Worlds Enough for Time', *Nous*, 25 (1991), pp. 1-19. Although we will develop our arguments with respect to Schlesinger's theory, we believe that it applies, *mutatis mutandis*, to Bigelow's theory as well.
4. Paul Horwich, *Asymmetries in Time: Problems in the Philosophy of Science* (Cambridge, MA: MIT Press, 1987), chap. 2.
5. It should be pointed out that it doesn't really matter at this point whether one uses McTaggart's or Schlesinger's criterion for distinguishing A-statements from B-statements. For, on either account, a statement which relativizes the presentness of an event to a particular moment in time is a *paradigmatic* B-statement.
6. When a version of this paper was presented to Schlesinger's NEH Seminar on the philosophy of time (Summer 1991), this response was suggested by Harriet Baber and subsequently adopted

by Schlesinger (in correspondence) as an official response to this argument. It is worth pointing out, however, that this response constitutes a retrenchment from the position Schlesinger advanced in his paper. For Schlesinger explicitly licenses the inference from (3) to (4) when he says that “at  $m_n$ ,  $W_n$  is actual, while at  $m_{n+1}$ ,  $W_{n+1}$  is actual”(1991, p. 430).

7. It might be noticed at this point that a *right before* ordering relation appears to presuppose that time is discrete rather than continuous (as is commonly supposed). This, however, is precisely Schlesinger’s view. For Schlesinger maintains that the actuality of each world “endures a mere fraction of a second only, ... being at a maximum  $10^{-1}$  seconds length and at a minimum of  $10^{-2}$  seconds length”(1991, p. 430). Thus, the ordering of worlds in the A-series is in fact an ordering of discrete elements.

8. We would like to thank the National Endowment for the Humanities for Summer Seminar fellowships to attend George Schlesinger’s seminar on the philosophy of time, during which this work was completed.