On Temporal Events and 4-Space

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Abstract

I will attempt to explain why there is (quite literally) no time like the present; beginning with a discussion of what is meant by the term. Then I will consider the ontological status of "past" and "future." How does the past time and the future time exist? Can statements about future states of the world be true or false? Why simultaneity represents a potential problem for some analyses of time? Is it more reasonable to view time philosophically as the fourth dimension of space/time rather than as a separate ontological entity?

1 Introduction

There really *is* no time like the present; although, it is tempting to think of past, present and future as disparate places forever fixed. A. N. Prior warns us about viewing temporal elements in such a manner: "much of what is present isn't present permanently..." [6] Prior suggests that the reality of the present is very much like the reality of everything else: it is the absence of a qualifying prefix on the state of affairs.

The state of affairs which obtain in the world, is reality. Whereas the combinations of the state of affairs that do not obtain are not the real world. Niether are they even other possible worlds. Prior begins with the analogy of a world of Greek myth-makers versus the real world. To say that "there are possible worlds in which centaurs exist," implies simply that "it could be

that there are centaurs." If you were going to say that "there are horses," then you would just say *that* without any qualifiers (of a temporal or spacial nature.)

Hence, to say that "I am writing this essay now," is stating a set of affairs that are currently true. The present, as a "special" region of space separating it from the future or the past, makes no sense. Instead the present is an absence of a qualifying prefix of a temporal nature. Using the previous similar fallacious stream of thought, one might be tempted to say that time is, in its own reality; its own dimension. However, we shall cover that later in this essay.

2 Ontology of time events

The ontology of temporal events seems to be a considerable area of discontent among philosophers. Some claim that there is *no* continuity: any continuity perceived is the mere mind drawing connections through time; other state that there are simply no such things as temporal events: time does not exist. Although this is quite complex and goes back to the medieval times, discourse on the existence of events, especially in light of the theory of relativity by physicist Albert Einstein, are very much still necessary.

C.D. Broad begins his essay warning us about analogous arguments of time and space. Although it may seem that the single dimension of time, compared to the multiple dimensions of space, gives way toward simplistic reasoning, they are very complex and difficult matters. In the deceiving analogy,

> "we treat our geometry in terms of unextended points and their relations, [in the same manner as] we treat out chronometry in terms of moments without duration and *their* relations ... just as we never perceive points or even unextended particles, so we are never aware of moments or of momentary events."[1]

This seems a convincing argument in order to dismiss time as a simple problem solved. Broad, however, notes two peculiarities with Time: its characteristic of the *intrinsic order* and *intrinsic sense*.

Three points, claims Broad, on a straight line have an intrinsic order. This means that on a line with three points (A, B, C,) A is between C and B, or B is between A and C. Whichever way you would like to see it,

this order is independent of anything crossing the line. By intrinsic sense, Broad means that there is a distinct difference between ABC, and CBA. The intrinsic sense is assigned to the points by the relative position of the right-ness and left-ness of the line from the observer. If, however, we were to place this spacial analogy in respect to time, then Broad claims that we would need a ray. This ray would give the line an intrinsic sense. In this way, you know that you are travelling in a particular direction, safely saying that the intrinsic sense of the line is indeed ABC (or CBA, &c.) So now the argument has fallen back on itself in a circular manner: we are attempting to explain (and hopefully simplify) time; yet we are using the concept of time (before-ness and after-ness) by making the straight line a ray.

2.1 Existence of temporal events

The existence of temporal events have been denied outright by philosophers such as J.E. McTaggart, stating the distinction between A-Series events (past, present and future characteristics) and B-Series events (relational earlier than, and later than). B-Series is discounted by McTaggart because it relies on the existence of the very subject we are attempting to dissect: time. Whereas A-series events create a contradiction because all events have these characteristics, yet they are incompatible. Since B-Series relies on A-Series' proof in order to exist, and A-Series' argument fails, then there can be no B-Series events nor A-Series events. This leaves us without the existence of time itself![5]

Broad stated about the above argument: "I should suppose that every reader must have felt the same way about it as any healthy-minded person feels about the Ontological Argument for the existence of God, viz., that it is obviously wrong somewhere, but that it may not be easy to say precisely what is wrong with it." The details of McTaggart's argument are very well beyond the scope of this essay, however, Broad has done a fine job of critiquing McTaggart's arguments.[1] Let us review this criticism.

Broad begins by asserting that there is no contradiction to be avoided with the instantiation of A-Series events. When McTaggart had stated that no one "term" could have the pastness, presentness, and futurity without a contradiction, this only applies to the simultaneity of at least two of these characteristics in one term.[2, p. 77] Broad continues to state that no term

[1] See Van Inwagen p. 77

ever has had these characteristics simultaneously, but rather in *succession*.

2.2 Veracity of future states

The veracity of future states presents another complex piece in this puzzle. A coherent and definitive explanation of future events was given by C.D. Broad, and a less definitive explanation by A.N. Prior. Broad concentrated on the fact that the future is non-existent: events that occur in the present and move on into the past, actually instantiate themselves and aquire additional characteristics respectively (which allow it to move into the past.) Prior states his belief in the distinctness of events coming to pass and not as a tapestry where everything (even those things in the future) are written out - the fatalistic view.

Prior brings to the forefront the concept of the "tapestry" where everything is timeless and eternal. By defining the logical "statement" as once true, always true, the veracity of "my sitting down is always true if it once was," is demonstrated. There is one stipulation to make this logical claim non-contradictory: qualifiers must be present of the time and place of the particular statement. Stating the time, removes the need for a tensed verb: I am sitting down at 02:30 (Eastern Standard Time) on January 27, 2001. This complete statement gives us a timeless property of a date or moment.[7, p. 104] Which is what, according to Prior, the tapestry metaphor is regarding. On the other hand, Prior precludes an event, which has happened - which is true - to be changeable. What is in the past is done, and nothing can change that, however, what is in the future (or at least the near future) is able to be instantiated by ourselves. Further, that the passage of time is not relative!

Going against B-Series events, Prior states that relativity of events is relegated to the physicists and philosophers of science: pastness, futurity and presentness are characteristics of events independent of the observer; however, under certain circumstances the events may be perceived by one or more observers. Humans do not think in relative terms and this might be part of the problem (debate).

Taking on a somewhat differing path, Broad states that there is no future, rather a *becoming* of events that then acquire new characteristics which they could not have before. In effect, as the event moves through time, from the present to the past, to the far past, it does not change its previously held relations, instead it acquires new relations.

Broad defines a difference between the acquisition of relations, as an ob-

ject goes from the present, to the near past then to the far past, and the movement of events from the future, near or far, to the present. The latter he has called the *Becoming* of events; this differs from a simple "change" in that change requires the *terms* of the relations to exist both before and after it. For example, if we were to say that a traffic light has "changed" from red to green, then we are assuming that the traffic light had already existed in its red state, in order to be called a "red" traffic light.

Now, however, we stumble upon a quite interesting dilemma: if the future does not exist, then what is to become of the judgements about the future? Here, Broad states that no judgement about the future is absolutely certain (but note that neither is any judgement about the past.) He states that judgements about the future are not about whether we can have *certain* knowledge regarding the future. Rather, the question is what do we mean and what are we talking about when we refer to the veracity of judgements about the future? Broad states that we are talking about a certain set of characteristics (which are very real) but do not happen to refer to any real facts! The only time judgements about the future can be verified as true or false, is when there is a fact for them to refer to.

3 Possibility of a fourth dimension

While the math may seem to lend credence to a fourth dimension, the logic (possibly due to being subject of Godel's incompleteness theorem) does not lend itself so easily for such an-other worldly existence. The existence of a fourth dimension can be perceived through thought experiments. Martin Gardner explains:

> "Imagine that the cosmos is completely empty save for one single human hand. Is it a left hand or right hand? Since there are no intrinsic, measurable differences between enantiomorphic objects, we have no basis for calling the hand left or right. Of course if you imagine yourself looking at the hand, naturally you will see it as either right or left, but that is the equivalent to putting yourself (with your sense of handedness) into 3-space. You must imagine the hand in space to be completely removed from all relationships with other geometrical structures. Clearly it would be meaningless to say that the hand is left or right as it would

> be to say it is large or small, or oriented with its fingers pointing up or down."[4, p. 110]

The problem arises when a human body (with severed hands) appears in this fictional cosmos. The hand will only fit either the left side or the right side. If one assumes that it will only fit the left side, then one sees the paradox in this: the hand (if it fits the left wrist) must have been a left hand *before* the body appeared. In other words, the concept of left-ness and right-ness existed even in a universe devoid of all other relational objects. Kant asserted that this would imply that space itself had an absolute structure.

A paradox exists that may lend credence to this discovery of Kant's, but Gardner unravels this paradox by flattening the hand and applying human 3-space perspective. If we were to have a flat hand (let us say that it is transparent so that we can use our 3-space view and look at its mirror image without difficulty) as the only object in the universe it does not have any asymmetrical properties, for it is the only thing in this universe. If we introduce a similar flat human, with two missing hands, with the qualification that "left" is the side associated with the placement of the heart in the human body, then we place the hand where it fits and determine its "left" or "right"ness. However, since this human is flat and transparent, then we can just use our 3-space privilege and get the opposite results. The hand that we just placed on his left wrist, is now a *right* hand! In sum, neither the hand nor the body has changed any of its properties for us to get to this conflicting conclusion. It's simply that their *relations* to each other in two space are changed.[4, p. 110]

James Van Cleve points out a similar analogy regarding the circumvention of 2-space constraints via 3-space use to 3-space constraints via 4-space use. If "tokens" of the letter 'p' and 'q' were constrained to 2-space sheets of paper, none of the letters could be manipulated within 2-space to occupy each other's space. However, if we flip either letter *through* 3-space and bring it back down to 2-space, then we can convert the 'p' to a 'q' (or vice-versa.) If there were a four dimensional space, you could take the 3-space asymmetrical object (the hand, for example) and "flip-it" through 4-space so that the left hand becomes the right (or vice-versa.) This analogy would tend to favour the externalist view that "left-ness" or "right-ness" is purely relative; this externalist view would be true iff[2] four dimensions were proven to be right.

[2]"iff" means "if and only if"

In support of Kant's views, however, there is the physical phenomena of the *fall of parity*: some laws of nature are sensitive to the distinction between right and left. This would seen to support the view that left-ness and right-ness is an absolute in the universe. [3, p. 114] Hence, we are right back where we started: *if* the fourth dimension is true, then we can prove the externalist view of the world. Otherwise, the only thing that is solid now, is an absolutist view of the world, due to the very real *fall of parity*.

References

[1] Broad, C. D. "The General Problem of Time and Change: an Excerpt from *Scientific Thought*." Van Inwagen 82-93.

[2] Broad, C. D. "McTaggart's Arguments against the Reality of Time: an Excerpt from *Examination of McTaggart's Philosophy*." Van Inwagen 74-80.

[3] Van Cleve, James. "Incongruent Counterparts and Higher Dimensions." Van Inwagen 111-120.

[4] Gardner, Martin. "The Fourth Dimension: an Excerpt from *The Ambidextrous Universe*." Van Inwagen 108-111.

[5] McTaggart, J. McT. E. "Time: an Excerpt from *The Nature of Existence*." Van Inwagen 67-74.

[6] Prior, A. N. "The Notion of the Present." Van Inwagen 80-82.

[7] Prior, A. N. "Some Free Thinking about Time." Van Inwagen 104-107.

[8] Van Inwagen, Peter and Dean W. Zimmerman ed. *Metaphysics: The Big Questions*. Malden, Mass.: Blackwell Publishers, 1998. Pp. 1-13, 17-22.