Two Ways of Looking at Time

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We all *think* we know the difference between past and future, but philosophers and scientists have never been entirely successful in putting their finger on this difference. The problem is complicated by the fact that there are at least two quite distinct ways of considering time, and that the difference between the future and the past depends on which way we adopt. These ways are two distinct views of the changes that occur in the world. Briefly, the first view sees *past, present and future changes*, and the second view sees *changes at particular dates and times*. This distinction was first emphasised by the Scottish philosopher J. Ellis McTaggart in a celebrated paper of 1908 (*The Unreality of Time*, Mind Vol. *68*, 1908), and has been the subject of numerous discussions since then. It is still not clear to us which view of time is the better: we do not really know which is the more fundamental, and even whether either of these approaches is strictly consistent in the first place.

McTaggart called talk of 'past', 'present', and 'future' events the 'A series' way of looking at time. On this approach, an event such as the Apollo moon landing starts off by being future, then becomes present when it actually happens, and finally becomes a past event of history. That is, in July 1969 we would have said the moon landing *was once* future, but *now* is present and *will be* past, and that there is an essential difference between the three cases.

The 'B series' on the other hand, says simply that the moon landing occurred in 1969, which was *after* President Kennedy's death in 1963, and *before* the launch of the Space Shuttle in the 1980's. The B series makes no mention of an event's 'being now past', but only that an event may be 'before 1986'. There is no fixed reference to 'now', as the time of 'now' is always changing. In the B series, an event doesn't itself change when it appears to happen — we just observe it from a later time, rather than from an earlier time. There is now *no* fixed difference between *the* future and *the* past, it is just that some events occur after others. Whether an event appears to be future or past depends merely on its relation to the observer's place in the B series.

The B series, by giving dates and times, seems tidier and more scientific. A scientist is unhappy writing 'the moon landing occurred 17 years ago', when he can put down 'the moon landing occurred in July 1969', quite objectively. The reader would not have to ask immediately 'When was this report written?'. Tenses such as past, present and future, though used by the scientist in his everyday life and in setting up his experiments, have no part to play in his theoretical analyses of nature. In his theory there are only dates and times. The B series also seems more in agreement with the 'space-time' of Einstein's Theory of Relativity. Many people have taken Einstein's theory to imply that all events (past, present and future) are 'laid out' in time, just as the episodes in a book or a film are laid out and fixed even before we come across them. As philosophers, however, we have to consider whether this implication is strictly justified, as there might be alternative approaches that are equally consistent.

It seems unlikely that the B series is the whole story about time, as by itself it says in effect that there is no intrinsic difference between the future and the past. This leaves unexplained several features of time and change, at least as they appear to us. In our everyday and common-sense understanding of time, the future is different from the past in a number of ways: (1) we have memory of the past but not of the future, (2) we think we can change the future, but not the past, (3) we feel that in the present we are performing new actions that add to the past but not to the future.

If we look to physics for some clue as to the difference between the future and the past, we notice that a law such as the second law of thermodynamics states that randomness in a closed system increases with time. This means that a breaking glass spontaneously falls into many random pieces, and that we don't see many random pieces spontaneously reforming into a glass. The only way we could see such an incredible event would be to artificially run a film backwards. This seems to imply that in physics there is *some* difference between the future and the past, but physicists themselves disagree on its philosophical significance. They disagree because they don't really know what causes the apparent difference, as there is nothing in Newton's laws, or in Einstein's theories, or in quantum physics, to give rise to it. In fact, these laws tell us that if we consider the broken fragments of the glass in their particular arrangement scattered on the floor, then it is highly improbable that *this* arrangement would be the outcome of dropping the glass. But any event, however improbable, becomes much more likely once it has actually happened! Perhaps all we are seeing with the breaking glass is the difference between 'before the event' and 'after the event' probabilities as our knowledge increases.

When we consider what other indications there may be for a 'passage of nature' from future to past, many philosophers have pointed out that some kind of basic 'passage of time' is present whenever we think, or indeed are conscious of anything at all. We may not be thinking of anything in particular, but there always seems to be some sensation of the passage of time. The French philosopher Henri Bergson argues in 'Matter and Memory' (1896) that this experience of 'duration' is essential to whatever time may be. But scientists have not always agreed, partly because this experience is not an external observation, and partly because they are not sure if it is a real phenomenon. Because the sensation of a 'passage of time' doesn't make sense if you confine yourself to the B series way of talking, many scientists have discounted it. As philosophers, however, we want to consider whether various alternative views can be made coherent, and so we cannot commit ourselves in advance.

McTaggart himself had an interesting motive in distinguishing the A from the B series. He argued that the A series *was* essential to an understanding of time, but also that the A series was *inconsistent*. Hence, he concluded, time itself was inconsistent, and hence unreal! This rather dramatic conclusion was unacceptable to many people, and has prompted many replies. But let us first look at his argument that the A series is inconsistent.

McTaggart points out that dates and times are fixed to events once and for all, but that the distinction between past, present and future is continually changing. The moon landing used to be future, but is now past. But these descriptions are incompatible: an event cannot be both future and past. Yet if an event is future, then it will be past too, and this seems contradictory. To avoid the contradiction, we might try to distinguish future from past by introducing the tenses 'will be' past and 'has been' future. Thus *in 1960* the 1969 moon landing 'will be' past, though not yet. Similarly *in 1980* the same landing 'has been' future, though not now. But this will not do, as these are precisely the different tenses that we are trying to explain! The analysis would go around in circles, as the A-series would be presupposed in order to account for the A series. This is clearly a vicious circle, McTaggart argues. Since we cannot accept a vicious circle as an explanation, we return to the basic contradiction that the descriptions 'past', 'future' etc., of the A series are mutually incompatible and yet true of every event. Thus the A series cannot be true of reality, and if it is necessary for time, then time itself cannot

be real.

There have been two main types of reply to McTaggart by those who want time to be real. One reply is to deny that the A series is necessary for time, and to hold instead that the B series of dates and times *is* sufficient for everything we want to do. Scientists for example are happy with ignoring the A series, and using only the B series of dates etc. Some philosophers have followed them on this issue, and do not believe that talk of tenses refers to anything real in the world. D.H. Mellor in his recent book 'Real Time' (Cambridge University Press, 1981) believes that the B series is sufficient for all explanations of what is true and false. Let us see how Mellor argues that the A series can be eliminated in favour of the B series.

Mellor argues that the sole function of the tenses 'future', 'past' and 'now' in facts like 'the moon landing is future' is to make these sentences true or false. Hence if we could decide the truth or falsity of such sentences in a way which did *not* involve tenses, then those tense words are *not* strictly necessary, and could be dispensed with. Mellor shows that there *is* a way of deciding the truth of tensed sentences without using tenses, by using what philosophers call 'token reflexive' meanings.

A 'token reflexive' sentence is simply one whose meaning depends on when *the sentence itself was asserted.* Its meaning is 'reflexive' in referring to itself, and is 'token' reflexive in referring to a particular token or instance of its own assertion. For example, the meaning of my saying 'I am now sitting' is token reflexive, as the 'now' refers to my act of saying that sentence. Similarly, a clock chiming is token reflexive, as the meaning of the chime refers to the event of chiming itself, in indicating that *then* it was (say) two o'clock.

Using this technical notion of 'token reflexive' meanings, Mellor is able to give rules for deciding the truth or falsity of sentences such as 'the moon landing is future'. The sentence is true if and only if the moon landing is *after* the utterance of that sentence. This simple explanation does *not* involve the A-series tenses 'future' and 'past' etc., only the B-series relations 'after' and 'before' etc., which hold between dates and times. Thus Mellor concludes that there is no *essential* use for the A-series view of time, and agrees with McTaggart's argument that the A-series is inconsistent. However, unlike McTaggart, he does not think this affects the B series, which, in his view, *is* sufficient for a notion of 'real time'. The B-series order of 'before' and 'after', he argues, is rooted in the *causal* order of cause and effect; however it would take us too far afield to discuss that now.

Other philosophers have attempted to give a second type of reply to McTaggart. They have tried to form a consistent account of tenses, and how the present can be the forming of the past out of the future. For example, the philosopher Alfred North Whitehead in 'Process and Reality' (1927) has constructed a 'process' view of the world in which tenses do make sense. In his view the A series is *not* the best description of tenses, as it appears to assume that future events are 'somewhere' in the 'future', just 'waiting to happen'. It is more likely that the future does not yet exist at all, he suggests. A similar view is described in Dorothy Emmet's book 'The Effectiveness of Causes' (Macmillan, 1984). One would argue on this position that in 1960 there was no such thing as a definite moon landing, for possibly such an event might never occur. At that time there were only *intentions* to land on the moon, but intending to land on the moon is quite different from a future moon landing 'waiting to happen'. Let us look at how the 'process' approach avoids the vicious circle McTaggart saw in the A series.

To say that the future 'does not exist all all' means that we have *neither* the A series *nor* the B series. We do not have the A series, because there are no such things as 'future events' to have the property of being 'future'. The future is not formed yet, so in 1960 say we could not have talked about '*the* moon landing'. We could only have talked of 'possibilities for moon landings' that we might hope to bring about. Before 1969 there was no such thing as '*the* moon landing event', so there was no particular event appearing out of the 'future' to become 'present'. This passage of events from the future to the past via the present, we agreed earlier, was the essence of the A series approach. Thus Whitehead and Mellor both agree with McTaggart that the A series is ultimately inconsistent.

Whitehead and Mellor differ, however, on the question of whether we have just the B series. According to Whitehead, we do *not* have only the B series, as there are no future events yet existing that could be at any particular dates and times, and ordered by 'before' and 'after' etc. At best, 'the future' is a set of possibilities, some of which may actually happen. Process philosophy *does* however allow the B series to be applied to *past* events, as all *these* have definitely happened, and so have perfectly definite dates and times that hold unchangeably. In fact, it allows

Image of time by Otto van Veen, teacher of Rubens; from his *Horatii Emblemata* (1607)

only the B series to be real for the past, and does not allow the A series properties of 'future', 'present' and 'past' to be real properties for *any* events. For even in the past, the 1969 moon landing is *itself* no different for being 10 minutes ago or 10 years ago, once it has definitely happened. This means that the A-series-like properties of '10 minutes in the past' and '10 years in the past' would not be real properties of the event concerned.

I have sketched two philosophical approaches that appear to avoid McTaggart's vicious circle, but have not decided between them. As far as the description of time is concerned, they seem to be equally consistent, so perhaps you are free to choose either view.

Time, however, is very much involved in causation: in how causes lead to their effects. In Mellor's B series view, causes make their effects more probable than otherwise. The process view of time allows for more dramatic 'effective causes' that *bring into being* their effects. It also allows for randomness and/or 'creative novelty' in the present, as it is only then that the past is being definitely formed. This may have a bearing on randomness in quantum physics, but again discussion of such questions will have to wait.

You may have imagined that science would provide a definite answer to such a fundamental question as the nature of time, but in fact scientists differ among themselves. The sciences do give us new evidence which can be used to check any proposed answers, but we have seen above that at least two quite different views can be compatible with the evidence, and this means that philosophical considerations must be used to decide between them. Clearly, there is room for more debate on these issues of time and causation, and room for new contributions to our understanding of the age-old question 'What is Time?'.

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