Que sera sera

Robert Stone

Before I get down to the main course of this talk, I'll serve up a little hors-d'oeuvre, getting a long-held grievance off my chest.

It is a given of human experience that things appear to happen in order. Some things happen after other things, and yet other things happen after them. The most reasonable explanation for this experience is that things do in fact happen after other things, and we notice the fact. The whole area of 'before and after' is called 'time', one of those abstract nouns that, in the words of Philip Larkin, "brings the priest and the doctor in their long coats running over the fields". As soon as we invent an abstract noun – like time, mind, the good – people assume that it must refer to some kind of nonphysical entity, and a deluge of nonsense is unleashed. Time flows, events pass from future to past, the 'now' moves through time. Just as with 'mind', we could abolish the word 'time' from the language and still say all meaningful sentences we want to say without using either the word itself or any synonym of it. So I intend to talk about my chosen topic without once using the word 'time' – from hereon in!

The problem

My subject is statements about the future: can they be true now?

To clear away two possible ambiguities before I start, first, when I talk about statements, I'm referring only to unambiguous ones, where there is no doubt about what they mean. Second, I am ignoring here the question of whether the world is deterministic. Everything I say is meant to apply to statements made in any kind of world, whether fully deterministic, totally random, or somewhere in between.

The problem was first flagged up by Aristotle, whose general assumption was that any statement must be either true or false, whether it is about the past, the present or the future. He also recognised that, if something is the case, then the statement that it is the case *must* be true; and that, if a statement that something is the case is true, then *that* something *must* be the case.

To put it in terms of modern logic, where 'p' means a proposition (or statement) – and I'll use 'N' to mean 'it is necessary that' and 'T' to mean 'it is true that':

- it is a necessary truth that, if p, then it is true that p [N(p⊃Tp)]
- it is a necessary truth that, if it is true that p, then p [N(Tp⊃p)].

It is simply contradictory for it to be false that p, and yet p; or vice versa. Sounds obvious enough.

But when you apply that to statements about the future, for example 'there will be a sea-battle tomorrow', you run into problems. As we don't have many sea-battles these days, I'll take as my model statement 'Donald Trump will win a second term' – and, as I said earlier, we'll assume that we know exactly what that means. Now, suppose I say now – as I just did – 'Trump will win a second term'. Is what I say true?

The first thing to be clear about is that we don't know, and almost certainly can't know, at the moment. But, if we wait until November 2020, we'll find out, and then be able to say if my statement was true. Fair enough. But, suppose it turns out then that my statement *was* true, that means that it is true now, even if there is no way of our knowing it now. Yet, if it is true now, it follows – by a necessary entailment – that Trump will win a second term; and, if it is *false*, it follows – by a necessary entailment – that Trump will *not* win a second term. Remember: it is a necessary truth that, if it is true that p, then p.

Aristotle didn't like this. He believed that what happens tomorrow, or in 2020, is not yet determined in the way that what happened yesterday is already settled. Yet, if the statement 'Trump will win a second term' is already true, then it seems to be settled already that Trump will win a second term; and, if it is false, it seems to be settled already that he won't.

What happens if we say that neither the sentence nor its denial is true? Well, if it is *not* true that Trump will win a second term, then the statement that he will must be false – in which case the sentence saying that he will *not* win a second term will be true. It seems they can't both be false: the law of excluded middle.

What if both sentences are true? That is clearly absurd, as the law of contradiction does not allow that Trump both *is* going to win a second term and *is not* going to.

Medieval variation

How Aristotle solves this problem is anybody's guess. Ever since his day philosophers have been trying to do two things: (1) work out what Aristotle's solution was, which I'm not going to do here (but you can read all about it in the 2014 *Review*!), and (2) come up with an answer to the problem he raised. Do we have to assume different rules for statements about the future from those we use to talk about the past and present?

For some medieval philosophers the problem was more than just a fascinating puzzle. If you believe that God is omniscient, then he must know the truth-value of every statement that could ever be made, including statements about the future. Suppose I have to make some great moral choice tomorrow, for which presumably I'll be held to account on the Day of Judgment, he already knows what choice I'll make. Where does that leave my free will, my responsibility for my decisions? Can I plead before the court that my decision was already settled in advance? In fact the dilemma does not need God, or anyone else, to *know* what will happen in the future; it merely requires – as Aristotle makes clear – that the statement 'X will happen' is true, and *was* true 10,000 years ago even if no one actually said it!

Necessity and fixedness

Before I get on to possible solutions, one idea that seems to me to muddy the waters is the long-held belief that, because events in the past have already happened, by definition, they must be in some sense necessarily true. Now, there is a sense in which they are *historically* settled, and so inescapable and unpreventable. In this respect there is an obvious contrast with events of the future, which have not yet taken place and so any given possible event is still escapable, preventable, and certainly not inevitable. That prompts some philosophers to believe that the rules about future statements must be different from those about past statements.

But consider. First of all, any necessity we attribute to the past is by no means *logical* necessity. If we take a past event at random – say, the eruption of Vesuvius in 79 AD – it is not a logical truth that it happened; if we didn't know it had happened, we could not work it out by analysis of the meaning of the words. It is a *contingent* truth, since it depends on whether a certain event in the world did or did not happen. Assuming Vesuvius did erupt then, the statement that it did is true; if we find it did not erupt after all, then the statement is false.

All that is *logically necessary* is the logical truth that, if it happened, then it happened; or, if it happened, then the statement that it happened is true; or, if the statement that it happened is true, then it happened. That necessity applies equally to the future, or indeed to any statement about anything whenever it is made; it has no bearing whatever on whether the statement's truth is contingent or necessary.

Unfortunately, Aristotle, even though he does occasionally acknowledge the difference between logical necessity and other kinds, does not always keep the distinction in mind. There are certain events he regards as necessary – e.g. the movements of the planets, the sun rising in the morning – because the universe is made that way. They contrast with events in our bit of the world, where what happens depends on choices that we make, and other unpredictable causes. He is not always clear (in his own mind) whether he is talking about logical necessity or some other kind. This looseness has infected other later philosophers, who see statements about the future as differing somehow, in a logical way, from statements about the past – as you will see from some of the attempted solutions coming up now.

Attempts at a solution

1.One attempt at a solution is to argue that some statements are true at one moment but not at another. It might seem obvious that, if a statement is true, it is true for ever – allowing for the tense difference depending on when it is made. So, if the statement 'Trump will win a second term in 2020' is true now, it was true 10, or even 10,000 years ago, and it will be true in 10 years from now (2028) that he was going to win in 2020.

But some, including CS Peirce, want statements to be capable of being true or false at different moments. So, insofar as the future is not yet fixed (i.e. excluding necessary truths), bald statements about events going to happen are false *at the moment*, but may become true if and when the relevant event has happened. Yet to say that the statement 'Trump will win' made now is false, simply because it is about the future, seems perverse – though cheerful, until you realise that 'Trump will not win' is also false!

2. Another strategy – often attributed to Aristotle, though he clearly rejects it at one point in his argument – is to deny the law of excluded middle. In other words, some deny that every clearly expressed statement has to be either true or false; in particular, a statement about an event in the future that may or may not happen, does not have to be either true or false. It is still necessary to accept as true the claim that Trump either will or will not win a second term in 2020, but we need not accept that the statement 'Trump will win a second term' is either true or false; it may be somewhere in between.

This introduces the notion of **trivalent logic**, that is a system where there are no longer *two* possible truth-values (true and false), but *three* (true, false, and indeterminate) – or, as one might write it in digital form, 1, 0, and ½. The idea is that

- true statements about the present and past have the truth-value 1, or 'true',
- false statements about the present and past have the truth-value 0, or 'false' – just as normal
- but any statements about the future have the truth-value ½, or indeterminate.

The whole edifice of symbolic logic is incredibly complicated, and the originators of this new system – a group of Polish logicians in the 1920s and 1930s, of whom the leader was Jan Łukaciewicz – had to work out all the truth-tables to go with it. One big stumbling-block is that, according to the truth-tables, if the truth-value of p is ½ and the truth-value of q is ½, then the truth-value of 'p or q' is also ½. And so, if the truth-value of p is ½ and the truth-value of not-p is ½, the value of 'p or not-p' is ½.

In plain English, if the statement 'Trump will win a second term' is indeterminate, and the statement 'Trump will not win a second term' is also indeterminate, the statement 'either Trump will win a second term or he will not win a second term' is also indeterminate. Yet not only Aristotle but also common sense insist that that last sentence is simply true; surely it

must be the case, a necessary truth in fact, that Trump either will or will not win a second term?

So two approaches to the problem of future statements are

1) to claim that statements, though at any moment either true or false, may have different truth-values at different moments,
2) to propose a trivalent system where there is a truth-value intermediate between true and false.

3. A recent suggestion, which I think combines these two approaches, is that of John MacFarlane. He is worried that we have two intuitions about future statements, which are incompatible. On the one hand, it seems obvious that anyone who said five years ago that the Philsoc would have a weekend meeting in Trier five years later was making a statement that, as we now know, was true. On the other hand, it also seems hard (to some) to accept that the statement 'Trump will win a second term' can possibly be true now, because the future is 'open'. So he proposes that the truth of a statement may depend on the context.

There is a sense in which it does already. When someone says "it's Saturday today", that statement will be true if uttered on a Saturday and false if uttered on any other day. We have to assume that in the statement "it's Saturday today" the word 'today' refers to 17 November 2018 AD. Similarly with personal pronouns: "I am Bob Stone" is true only if the 'I', the utterer, is in fact Bob Stone. This he calls utterance-contextuality, and, by using this (even if we've never heard of the technical term!), we manage quite well in ordinary life to cope with these theoretically ambiguous sentences.

What MacFarlane introduces is the concept of 'assessment-contextuality'. When someone makes a statement about the future, at the moment she makes it there is no way of assessing whether it is true or false; so at that moment it is neither.

For example the statement made 5 years ago that there would be a Philsoc meeting in Trier five years from then was neither true nor false at the moment it was made, because at that moment it was impossible to assess its truth-value. But today, in our position of superior knowledge, we can definitively assess that statement as true; so, from the assessment-context of the present moment, that statement is true. Its truth-value has in fact changed from being 'neither true nor false' to being 'true'.

This is quite an ingenious device, and in fact the paper in which it appears won the *Philsophical Quarterly* essay prize for 2002! But, as MacFarlane acknowledges, it does do violence to another intuition, namely that, if a statement referring to a particular fact is true, it is always true; its truth-value cannot change because of circumstances. What we can all agree is that anyone saying 5 years ago that this meeting would take place was making a lucky guess, that she could not possibly have had any good reason for saying it, and that she did not know that it was true. But that is a point about her epistemic virtue, not about simple truth. The statement she made was nonetheless true.

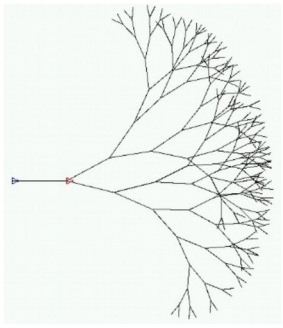
Another problem is that MacFarlane's idea would have to apply equally to those statements about the *past* whose truth is unknown: we don't know whether Vesuvius erupted on *August* 24th 79 AD, as the text-books say, or on *October* 24th as modern scholars are more likely to believe. Yet to say that the statement 'Vesuvius erupted on August 24th' is neither true nor false now, because our assessment context makes it impossible to know, seems perverse.

In fact MacFarlane, like Peirce, makes quite a thing about the *person* uttering the statement: her state of knowledge, her intention in making the statement, her ability to justify it. Yet, as Aristotle implies with his mention of a statement made about tomorrow's sea-battle 10,000 years ago, it is not the person who uttered that statement that counts, but the statement itself. Imagine an epoch in the future, when all conscious beings have died out, but computers still roam the landscape and on occasions generate statements about the future. Although there is no one around to assess their truth-value, it seems obvious that the statements made will be either true or false.

Past-future symmetry

And now the moment has come for what *I* think.

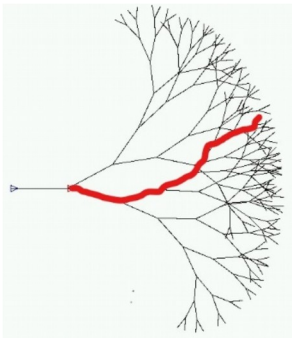
One way in which we can visualise the future is the 'branching future' diagram, which was apparently suggested by Saul Kripke when he was 17.



POSSIBLE FUTURES

At any moment, the situation may develop in a number of ways, and the way it does develop may itself branch off into any number of ways, each of which . . . etc. For the diagram to be accurate, it would have to be impossibly complex: as it stands, it suggests that there are only two possible things that could happen next at any moment, whereas in reality there are probably an infinite number. But you get the gist. All the branches you see are *possible* courses of events, but we know that only one of those myriad courses will materialise.

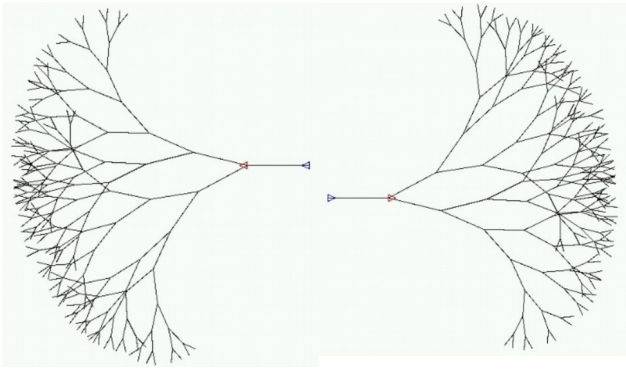
We could draw a thin red line along one course,



ACTUAL FUTURE

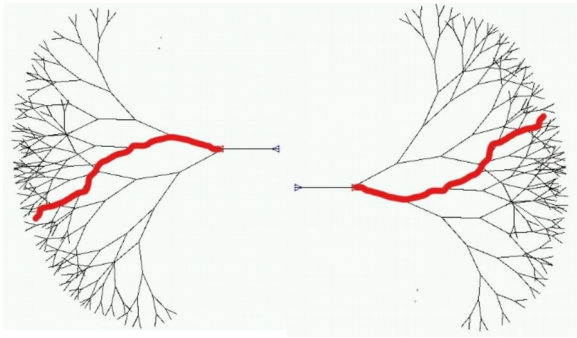
and that would signify that that course was actually going to happen: this is in fact the model suggested by some recent philosophers. Of course, we don't know now *which* course should be coloured red, but we do know (I think) that *one* of those courses is the one that will actually materialise and should be coloured.

One might think that the future is different from the past in this respect: whereas the future may branch out in any direction, there is just one line that represents the course of events leading up to the present. But look at this:



POSSIBLE PASTS *POSSIBLE FUTURES*

It has the past as a rotationally symmetrical equivalent of the future. When Chief Inspector Morse finds the body of Dr Black in Rewley House, he has to decide who killed the victim: was it Professor Plum, the Reverend Green, Mrs Peacock? And how did she kill him: with the revolver, the lead pipe, the candlestick? In his mind, all these combinations (which in the game of Cluedo, involving 6 suspects, 6 weapons and 9 possible rooms, amount to 324) form a series of branching lines that finish up at the trunk – or, more accurately, the body. When he solves the case, he mentally colours one of those branches red.



ACTUAL PAST *ACTUAL FUTURE*

Now, why can we not see the two branching systems, for past and future, as symmetrical? Here are eight reasons why we can.

1. In each case, there are infinitely many *possible* ways in which things *might* have led up to the present or *may* be about to develop from this point on; but there is only one *actual* way in which things *have* led here, and there is only one *actual* way in which things *will* proceed from here.

2. The statement that Colonel Mustard dunnit, with the dagger, in the library, is contingently true or false, depending on whether he did it or not; it is not a necessary truth that he did, or a necessary truth that he didn't.

Similarly, the statement that Trump will win a second term is contingently true or false, depending on whether he will win a second term; it is not a necessary truth that he will, or a necessary truth that he won't.

3. It *is* a necessary truth that Colonel Mustard either did or did not do the murder; and it *is* a necessary truth that Trump either will or will not win a second term. That's the law of excluded middle.

4. It *is* a necessary truth that, if Colonel Mustard did the murder, then Colonel Mustard did the murder; similarly, it *is* a necessary truth that, if Trump will win a second term, then Trump will win a second term.

5. It is a necessary truth that (a), if it is *true* that Colonel Mustard did the murder, then Colonel Mustard did the murder; and (b) it is a necessary truth that, if it is *true* that Trump will win a second term, then Trump will win a second term.

6. Chief Inspector Morse does not yet *know* whether Colonel Mustard did the murder, and we do not yet *know* whether Trump will win a second term.

7. If it turns out that Colonel Mustard did the murder, the fact that the truth of the statement, that he did it, logically entails that he did it, obviously does not imply that the truth of that statement is the *cause* of his having done the murder.

Similarly, if it turns out that Trump gets a second term, the fact that the truth of my statement, that he will do so, *logically entails* that he will, does not imply that the truth of my statement was the *cause* of his winning the second term. Logical entailment is not causation.

8. You can't change the past (obviously); nor can you change the future. If you did, it wouldn't have been the future, and the change you wrought was the *real* future!

Conclusion

From this symmetry, we can see that problems raised about future statements are no more problems for the future than for the past.

- Our *ignorance* of the future is greater than our ignorance of the past only in degree,
- the many *possibilities* of the future are mirrored by the many possible lines in the past that might have led to the present,
- truths about the past are just as *contingent* as those about the future,
- the *logical* connection between future states of affairs and true statements about them is exactly the same as for past states of affairs,
- there is no hint of a state of affairs, past or future, being *caused* by the truth of a statement about it.

I think that there are, as I have mentioned, three logical fallacies that prompt the unease about future statements, namely that

a) logical entailment is a kind of cause,
b) truth-value has something to do with knowledge,
c) the state of mind of the maker of a statement has something to do with its truth-value.

But there is one serious extra fallacy that Aristotle appears to commit and which needs to be nailed once and for all – here, in Trier, in 2018!

We all agree that 'it is a necessary truth that, if p, then p'. Now a loose way of saying that would be to say 'if p, then necessarily p'. But that might give the idea that the second p is a necessary truth; yet, of course, what is necessary is not p, but the entailment of p by p; it is necessary that, *if* p, *then* p.

This is slightly easier to keep in the head if written out in symbols. 'N(p⊃p)' does *not* mean 'p⊃Np'. The same applies to the necessary truth 'N(Tp⊃p)'. That does not make p a necessary truth; the only necessary truth is the entailment of p from the truth of p. 'N(Tp⊃p)' does *not* mean 'Tp⊃Np'.

So, when I say that *it is a necessary truth that, if it is true that Trump will win a second term, Trump will win a second term*,

I do not imply that, *if it is true that Trump will win, then it is a necessary truth that he will win*.

The only necessity is the logical connection between his winning and its being true that he will. His winning is contingent on what happens in the next two years.

It seems to me that the whole problem that is perceived about future statements, that they somehow make the future necessary or fixed, when we believe it is contingent, is based on the failure to spot that fallacy.

To summarise, statements can be divided into these categories:

- true or false
- necessary or contingent
- known or unknown
- past, present or future

These categories are entirely independent of each other, and there is no reason why a statement about the future should not be simply true or false, without implying anything about its status in either of the other two categories.

There is, in short, *no problem* with statements about the future being true or false. Doris Day was right: *Que sera sera*. What will be will be.

And, by the way, if it turns out in November 2020 that I was making a true statement when I said 'Trump will win a second term', don't blame me. I didn't make it inevitable. It wasn't my fault!

Trier, 17 November 2018