THE OPEN PAST

Ned Markosian

This paper is about the open future response to fatalistic arguments. I first present a typical fatalistic argument and then spell out the open future response as a response to that argument. Then I raise the question of how the open future response can be independently justified. I consider some possible ways in which the response might be defended, and I try to show that none of these is a plausible, non-question-begging defense. Next I formulate what I take to be the only plausible, non-question-begging defense of the open future response. This defense involves both (i) the claim that the laws of nature are indeterministic and (ii) a certain version of the correspondence theory of truth. Finally, I argue that there is a very surprising consequence of justifying the open future response by making the defense in question, namely, that the past is sometimes open.

Fatalism is the view that whatever will happen in the future is inevitable, due to certain considerations about truth and time. Fatalism, in turn, is normally taken to imply that there is no such thing as genuine, human free will. Suppose that I am an anti-fatalist. Suppose I believe that Joe Montana is free to choose what he will have for lunch tomorrow, and suppose I take this case to be a paradigmatic example of one involving both evitability and human free will. Now suppose that I meet a fatalist, who presents the following argument.[1]

---

[1]   The locus classicus of arguments like the following is to be found in Chapter 9 of Aristotle's *De Interpretatione* (in *The Complete Works of Aristotle*, edited by Jonathan Barnes (Princeton University Press, Princeton, NJ, 1984)). More recently, Richard Taylor has advanced similar arguments in his article "Fatalism" (*Philosophical Review*,

(1) For every time, t, and proposition, p, either p is true at t or else p is false at t.[2]

(2) If (1), then there are now true propositions that, taken together, completely characterize Montana's lunch menu for tomorrow.

(3) If there are now true propositions that, taken together, completely characterize Montana's lunch menu for tomorrow, then whatever will happen concerning Montana's lunch tomorrow is inevitable.

(4) If whatever will happen concerning Montana's lunch tomorrow is inevitable, then whatever will happen in the future is inevitable.

_____

(5) Whatever will happen in the future is inevitable.

If I'm an anti-fatalist, then I will naturally want to reject some premise of this argument. Which premise can I reject? Premise (2) seems to depend only on the existence now of propositions about Montana's lunch menu for tomorrow, and I can hardly deny that many such propositions already exist; after all, anyone could express today the proposition that Montana will be having tuna fish for lunch tomorrow, as well as the proposition that he will be having a cheeseburger, as well as the proposition that he won't be having lunch at all, and so on.

Premise (3) is based on the extremely plausible claim that if it's true now that a certain thing will happen tomorrow, then there is nothing that anyone can do now to prevent that thing's happening tomorrow.[3]

---

[2] For the purposes of this paper I will be assuming, with such writers as Aristotle, Peirce, Lukasiewicz, Ryle, Thomason and McCall (see footnote 4 below), that it is appropriate to speak of propositions as having truth-values *at times*, and not merely *simpliciter*. Premise (1), which will also be referred to as "the principle of bivalence," is formulated in such a way as to be consistent with this assumption.

[3] My own view is that this premise is false, for reasons explained by David Lewis in his "The Paradoxes of Time Travel" (in his *Philosophical Papers*, vol. II (Oxford University Press, Oxford, 1986), pp. 67-80). In this paper, however, I will not be challenging this premise.

Premise (4) is based on the seemingly uncontroversial claim that this case is a paradigmatic example of a case that appears to involve evitability, so that whatever point can be made about this case will be generalizable to all other cases that appear to involve evitability.

It looks as if my best bet, then, will be to reject premise (1), which is simply a statement of the principle of bivalence. Let us agree on some terminology. To say, with regard to some time, t, that the future is *open* at t is to say that there are some propositions about the future relative to t that are, at t, neither true nor false. To say that the future is *closed* at t is to deny this, i.e., to say that every proposition about the future relative to t is, at t, either true or else false.

If I respond to the above argument by rejecting premise (1), then I will be responding to an argument for fatalism by maintaining that the future is sometimes open. Let us call this move "the open future response" to fatalistic arguments. It typically involves maintaining that if a proposition is about a matter both future and contingent, then the proposition is neither true nor false; it has some other truth-value, or else it has no truth-value at all.

The open future response to fatalistic arguments is in fact a move that has been popular among anti-fatalists. It at least appears that Aristotle endorsed this move, and more recent philosophers such as Peirce, Lukasiewicz, Ryle, Thomason, and McCall have all explicitly endorsed it.[4]

Now suppose that the fatalist challenges my claim that the future is sometimes open. He points out that for many people, the principle of

For another discussion of ways to reject premises like (3) in arguments for fatalism without having to maintain that the future is ever open, see Peter van Inwagen's *An Essay on Free Will* (Oxford University Press, Oxford, 1983), Chapter II.

[4] Aristotle, *De Interpretatione*, Chapter 9; C.S. Peirce, *Collected Papers of C.S. Peirce* (Harvard University Press, Cambridge, MA, 1934), 5.459, and 6.368; Jan Lukasiewicz, "On Determinism" (collected in *Polish Logic*, edited by Storrs McCall (Oxford University Press, Oxford, 1967), pp. 19-39); Gilbert Ryle, *Dilemmas* (Cambridge University Press, Cambridge, 1954), pp. 19-20; Richmond Thomason, "Indeterminist Time and Truth-value Gaps" (*Theoria*, **36** (1970), pp. 264-281); and Storrs McCall, "Objective Time Flow" (*Philosophy of Science*, **43** (1976), pp. 337-362).

I say that *it at least appears that Aristotle endorsed this move* because it is not entirely clear just what Aristotle intended to say in his famous discussion of this matter, even though many commentators have taken him to endorse the open future response to fatalistic arguments.

bivalence enjoys the status of a long-standing, pre-philosophical intuition, and he adds – correctly, I think – that such an intuition should not be given up lightly. He says that unless I have some *independent* reason for claiming that the future is sometimes open, my response to his argument, in the context of our debate about fatalism, is *ad hoc*.

How, in the face of such an argument from the fatalist, can I respond? One possibility would be simply not to try to defend the open future response. But remaining silent is not a very satisfying way of defending a philosophical position. A second possibility would be to try to defend the open future response by saying, "The future is sometimes open, because otherwise there wouldn't be any real evitability in the world." But to say this would be to beg the question, since one of the questions at issue is whether there is indeed any real evitability in the world. A third possiblity would be to try to defend the open future response by saying, "The future is sometimes open, because we people are free to make choices that determine how the future will turn out." But this, of course, would be another question-begging defense, since the very claim that we *are* free is at stake.

It should be clear that it is enormously difficult for the anti-fatalist to defend the open future response in a way that is both plausible and does not beg the question against fatalism. My own view is that there exists only one plausible, non-question-begging defense of the open future response to fatalistic arguments.

The defense of the open future response that I have in mind is one that will involve both (i) an appeal to a certain claim about the laws of nature, and (ii) an appeal to a certain principle about what makes a proposition true. The relevant claim about the laws of nature is simply that the laws of nature governing our world happen to be indeterministic. In order to spell this out it will be helpful to settle first on some terminology.

Let us agree to talk about *states of affairs* and *world states*, where a *world state* is understood to be a state of affairs that constitutes a way for the entire world to be at an instant.[5] Then we can define determinism and indeterminism as follows. To say that the laws of nature are *deterministic with*

---

[5] Here is a more rigorous definition. A state of affairs, S, is *maximal* just in case for every state of affairs, S', either S entails that S' obtains or else S entails that S' does not obtain. A state of affairs is *consistent* just in case it is logically possible that that state obtain. Then we can say that a *world state* is a maximal, consistent state of affairs.

regard to the future is to say that the laws are such that for every physically possible world state, WS, and pair of times, t1 and t2 (such that t2 is later than t1), there is some unique, physically possible world state, WS', such that the laws entail that if WS obtains at t1, then WS' will obtain at t2. To say that the laws are *indeterministic with regard to the future* is to deny this.[6]

The principle about truth that is relevant to the defense of the open future response that I have in mind is a kind of tensed version of the correspondence theory of truth. That is, it is a version of the correspondence theory of truth that is designed to be consistent with the claim that propositions have truth-values at times. More specifically, it is a version of the correspondence theory of truth according to which it is a necessary condition, for a proposition to be true at a time, that that proposition correspond to the world in the appropriate way at that time. The principle may be formulated as follows.

> *The Tensed Version of the Correspondence Theory of Truth* (TCT):
> For any time, t, and proposition, p, p is true at t just in case p corresponds to the world at t.[7]

It is worth pointing out that although TCT might appear, at first glance, to be uncontroversial, it should in fact be looked upon with raised eyebrows. For TCT constitutes a radical departure from the standard conception of the semantics for future- (and past-) tensed sentences. Let me explain.

Consider the future-tensed sentence 'It will be the case one hour hence that it is raining in Boston'. According to the standard conception of the semantics for future-tensed sentences, this sentence is true at a time, t, just in case the present-tensed sentence 'It is raining in Boston' is true at the time one hour later than t. Thus, on the standard conception, the future- and past-tense operators (e.g., 'It will be the case one hour hence that') are like truth-

---

[6]   Many physicists today seem to think that the laws of quantum mechanics are in fact indeterministic, so at least this much of the anti-fatalist response under discussion is plausible.

[7]   Since the object is to defend the rejection of the principle of bivalence, the anti-fatalist cannot simply say, as an account of falsity, that for any time, t, and proposition, p, if p is not true at t then p is false at t. What is wanted is an account of falsity that makes truth and falsity *contraries* rather than *contradictories*. That is, the anti-fatalist needs an account of falsity that will allow for the possibility that the propositions *that Montana will be having tuna for lunch tomorrow* and *that Montana won't be having tuna for lunch tomorrow* are both neither true nor false.

functional operators, except that the truth-value at a given time of a sentence that results from attaching a tense operator to a simpler sentence is determined by the truth-value at another time of the simpler sentence.

According to TCT, however, the proposition that it will be raining in Boston one hour hence (and so, consequently, any sentence that expresses that proposition) is true now just in case it corresponds to the world now. The truth of the proposition, according to TCT, is not determined by the truth of some other proposition at some other time.

What is at issue here is an important matter concerning the semantics for tensed sentences, which raises many interesting questions about what determines the truth-values of tensed propositions. I cannot here attempt to settle these matters. My concern is rather to try to show that TCT, together with the thesis that the laws of nature are indeterministic with regard to the future, can be appealed to in a way that constitutes a very plausible defense of the open future response to fatalistic arguments. In order to see this, consider an example. Suppose that right now it is an indeterministic matter whether a certain particle, p1, is going to be in a certain location, L1, one second hence. That is, suppose that all of the laws of nature governing our world, together with all of the true propositions about the momentary state of the world right now, do not entail that p1 *will* be at L1 in one second, and they do not entail that p1 *won't* be at L1 in one second. Consider the proposition that p1 will be at L1 in one second. In order for this proposition to be true right now, according to TCT, it must correspond to the way the world is right now. But what in the world right now could this proposition correspond to that would make it true? There is p1, with all of its properties; there is the environment around p1; and there are the laws governing these things.[8] But nothing about any of this can be pointed to as what makes it true now that p1 will be at L1 in one second. Similar remarks apply to this proposition's being false right now; that is, since its negation (the proposition that p1 *won't* be at L1 one second hence) is not true right now, there is nothing in the world right now in virtue of which the proposition that p1 *will* be at L1 one second hence could be false right now. Thus it seems to follow from indeterminism plus TCT that the

---

[8]   In order to make this way of defending the open future response to fatalistic arguments work, it is necessary to assume that truths about the laws of nature are truths about the present state of the world. This assumption may place constraints on what one can say about the the nature of the laws of nature.

proposition that p1 will be at L1 in one second is, right now, neither true nor false.

So I might defend my claim that the future is sometimes open by formulating an argument that appeals to indeterminism in the laws of nature, as well as some appropriate version of the correspondence theory of truth.[9,10] But there would be a strange consequence of doing so.

The strange consequence of this way of defending the open future has to do with the fact that the laws of nature are, at least for the most part, *time-symmetrical*.[11] In order to explain what this means it will be necessary to introduce the notion of a *reverse-state*. The intuitive idea is this. Consider a simple physical system involving a billiard ball in motion on a billiard table. The ball has, at each instant, a certain velocity, where the velocity of the ball at

---

[9] A qualification is in order here. It does not follow from indeterminism plus TCT that the future is ever *actually* open; rather, all that follows is that it is *possible* that the future be open. For it might turn out that the laws allow the possibility of states of affairs whose successors are not determined by the laws, but that no such state of affairs ever actually obtains. The example considered above was based on an empirical assumption, namely, that such a state of affairs actually obtains.

[10] Has any philosopher ever defended the claim that the future is sometimes open by making this move? It seems to me that something like this move is lurking somewhere behind most rejections of the principle of bivalence, but in many of the relevant cases the move is not made explicitly. Lukasiewicz and McCall are examples of anti-fatalists who do make the move explicitly (in the works cited above). Paul Horwich says some things that suggest that he has at least considered such a move, but he does not seem to endorse it. Horwich also seems to think that Aristotle should have defended the open future response to fatalistic arguments by making this move. See Horwich's *Asymmetries in Time* (The MIT Press, Cambridge, MA, 1988), pp. 31-33.

[11] There are some possible exceptions to this rule, including the second law of thermodynamics. I will assume here that at least some physical processes are both indeterministic and reversible.

The time-symmetry of (at least most of) the laws of nature has been much discussed. See, for example, Hans Reichenbach, *The Direction of Time* (University of California Press, Berkeley, CA, 1956); Adolf Grunbaum, *Philosophical Problems of Space and Time*, 2nd edition (D. Reidel Publishing Co., Dordrecht, 1973); Lawrence Sklar, *Space, Time, and Spacetime* (University of California Press, Berkeley, CA, 1974); and Horwich, *Asymmetries in Time*. Horwich's book contains a useful bibliography of works on this and related topics.

an instant consists of its speed at that instant and its direction at that instant. Let S be the state of this system at some particular instant. Now consider the state that results from taking S and reversing the directional component of the ball's velocity, so that instead of moving *east* at ten miles per hour, say, the ball is moving *west* at ten miles per hour. Call this second state "S'". Then S' is the reverse-state of S. Roughly speaking, then, for any state, S, the *reverse-state* of S is the state that consists of each entity contained in S arranged as it is in S and moving exactly as it is in S, but in the opposite direction.

To say that a law of nature is time-symmetrical is to say the following. If a particular sequence of world states, WS_1, WS_2, ..., WS_n, is allowed by that law, then the sequence WS_n', ..., WS_2', WS_1' (where WS_i' is the reverse-state of WS_i, for any number, i) is also allowed by the law. That is, if a given sequence of world states is allowed by the law, then so is the sequence that is, roughly speaking, the first sequence in reverse.

An example might help to make this clearer. Let S1, S2, S3 be a series of successive states of our billiard ball as it rolls across the table. S1 consists of the ball's being at a certain location – call it "L1" – and having a certain velocity – ten miles per hour, say, heading east. Then S2 consists of the ball's being at the next location – "L2" – and having (we will suppose for the sake of simplicity) the same velocity. Similarly, S3 consists of the ball's being at a third location – "L3" – and having the same velocity.

Let S1', S2' and S3' be the reverse-states of S1, S2 and S3, respectively. Then if the laws are time-symmetrical in the way I have been discussing, the sequence S3', S2', S1' is a physically possible sequence. What does this mean? Simply that the ball could go from being at L3 and moving west at ten miles per hour to being at L2 and moving west at ten miles per hour and then on to being at L1 and moving west at ten miles per hour. More simply, that the ball can roll west as easily as it can roll east.

Now, if some laws are both indeterministic with regard to the future and time-symmetrical, it follows that the same laws are *indeterministic with regard to the past*. That is, it follows that there are at least some physically possible world states that may, consistently with these laws, have been *preceded* by any of two or more different world states.

In order to see this, consider the following diagram.

S3   S3'

S1   S2   S2'   S1'
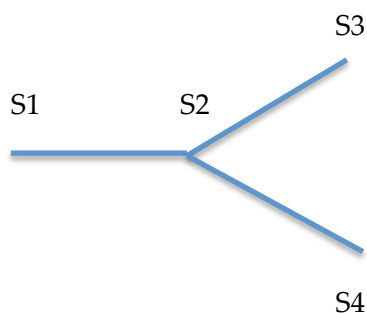
S4   S4'

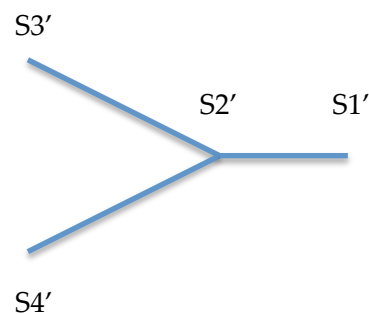Figure 1   Figure 2

Figure 1 represents the kind of model that is allowed by laws of nature that are indeterministic with regard to the future. The branch that occurs at S2 in Figure 1 indicates that S2 is a state about whose successor the laws are indeterministic. The laws allow that S2 may be succeeded by S3, and the laws also allow that S2 may be succeeded by S4.

Now, given that the laws allow the sequence of states S1, S2, S3, it follows from the fact that the laws are time-symmetrical that the laws also allow the sequence S3', S2', S1'. Similarly, given that the laws allow the sequence of states S1, S2, S4, it follows from the fact that the laws are time-symmetrical that the laws also allow the sequence S4', S2', S1'. Thus, if the world is in state S2' at any given time, it will, at that time, be an indeterministic matter what the *previous state* of the world was; from the laws and the present state (S2') at any such time it would not be possible – even in principle – to *retrodict* the previous state of the world. Hence the model represented in Figure 2 is, like the model represented in Figure 1, a model that is allowed by laws that are both indeterministic with regard to the future and time-symmetrical.

In short, if some of the laws of nature are both indeterministic with regard to the future and time-symmetrical, then the same laws are equally indeterministic with regard to the past. Hence if there is a good argument from indeterminism with regard to the future in support of the open future, then there is an analogous, and equally good, argument from indeterminism with regard to the past, such that the conclusion of the latter argument is the claim that the past is sometimes open.[12,13] For if it is an indeterministic matter,

---

12   Note that I am using 'open' as a technical term in this paper. To say, with regard to some time, t, that the past is open at t is to say that there are some propositions about the past relative to t that are, at t, neither true nor false. Thus, to say that the

as far as current conditions and the laws of nature are concerned, whether or not a certain particle, p2, was at a certain location, L2, one second ago, then there is nothing about the world *right now* in virtue of which it could be either true or false that p2 was at L2 one second ago; hence, in accordance with TCT, there is a proposition about the past that is, right now, neither true nor false.[14]

Suppose, then, that the fatalist with whom I have been discussing these matters presses me on just this point. He points out that there is this analogous argument for the thesis that the past is sometimes open. The thesis that the past is sometimes open is of course a strange thesis, and I am likely to resist being saddled with it. But can I fairly claim that there is some defect in the analogous argument? Is there some important disanalogy between the future and the past that renders the argument, as applied to the past, unsound? Of course, it is not open to me to say that it is precisely because the future is the realm of possibility and the past is fixed that the argument is unsound when applied to the past; for what is at issue now is whether there is indeed such a difference between the future and the past.

The point I am making here rests on two main claims: (1) that insofar as an independent justification is wanted for the anti-fatalist's claim that the future is sometimes open, the only plausible, non-question-begging justification available is the one sketched out above that appeals to the alleged

---

past is open at a time is not to say anything explicit about whether any person has, at that time, the power to change the past.

[13] Once again, a qualification is in order. It does not follow from indeterminism, TCT and the time-symmetry of the laws of nature that the past is ever *actually* open; rather, all that follows is that it is possible that the past be open. (See footnote 9 above.) But this result is certainly surprising enough.

[14] McCall, in "Objective Time Flow," dismisses the idea that the past is sometimes open, even though he admits that the laws of nature are indeterministic with regard to the past as well as the future, and even though it is the indeterminism with regard to the future that leads him to embrace the open future. He simply appeals to the intuition that the past is already settled in defense of his rejection of the open past.

Lukasiewicz, in "On Determinism," actually endorses the view that the past, like the future, is sometimes open, and does so on the grounds that the laws of nature are indeterministic with regard to both the future and the past. He does not, however, make the point that I am making here, namely, that those who make the open future response to fatalistic arguments, and who justify their doing so by appeal to indeterminism in the laws of nature, are equally committed to an open past.

indeterminism in the laws of nature together with TCT; and (2) that if some of the laws of nature are both indeterministic with regard to the future and time-symmetrical, then the same laws of nature are also indeterministic with regard to the past.

There are two morals that one might reasonably draw from these considerations. On the one hand, one might draw the moral that it was a mistake to defend the claim that the future is sometimes open by appealing to indeterminism in the laws of nature together with some appropriate version of the correspondence theory of truth. The difficulty with drawing this moral, however, is that there appears to be no other, non-question-begging defense of the claim that the future is sometimes open. On the other hand, one might draw from these considerations the moral that the future is sometimes open, and the past is too.[15]