

The Open Future

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1. Introduction

When we reflect on the nature of the past and the future, one asymmetry is particularly striking: whereas we think of the past as settled, fixed, and closed, we think of the future as unsettled, alterable, and open. What's done is done; the past is singular and closed off to us. The future, on the other hand, holds numerous possibilities; it is ours to shape.

In what follows, I will investigate the notion that there is an asymmetry in openness between the past and the future. How is this asymmetry to be understood? What is the relation between the open future and future ontology? What is the relation between the open future and whether contingent statements about the future are true or false? Is an open future compatible with a single determinate future?

2. What is the Open Future Intuition?

How should we understand the asymmetry in openness between the past and the future? Perhaps this asymmetry is no more than an asymmetry in our knowledge: we know much more about the past than we know about the future. I know what the weather was like this morning, but I fail to know what the weather will be like tomorrow morning. Perhaps the future is open in the sense that I do not now know what future possibilities will obtain.

Although an asymmetry of knowledge with respect to the past and future may be a *consequence* of the asymmetry in openness between the past and the future, it seems problematic to hold that the asymmetry in openness is merely an epistemic asymmetry. If we consider cases in which knowledge of the past and knowledge of the future are roughly on par, it still seems plausible to maintain that there is an asymmetry with respect to openness. For example, one could suffer from amnesia to such an extent that one's knowledge of the past is as impoverished as one's knowledge of the future. However such an individual would, it seems, nonetheless continue to maintain that there is a sense in which the past is fixed and the future is open. Also, arguably, I can have knowledge of some future event, such as that I will have porridge for

breakfast tomorrow morning. Yet despite my knowledge of this fact, it seems that the future is open with respect to what I will have for breakfast tomorrow.

Perhaps the asymmetry in openness between the past and the future is an asymmetry with respect to whether contingent statements about the past and the future have a truth-value. Perhaps to claim that the future is open is to claim that contingent statements about the future, such as the statement that I will have porridge for breakfast tomorrow, are neither true nor false, whereas contingent statements about the past, such as the claim that I had porridge for breakfast this morning, are either true or false. To claim that future contingent claims are neither true nor false is to deny the principle of bivalence which states that all meaningful statements are either true or false. Some have defined the openness of the future as the claim that the principle of bivalence does not hold for future contingent statements.¹

To the extent that we are trying to explain the ordinary intuition that the future is open and the past is fixed, it seems wrong to begin with the supposition that openness of the future amounts to a failure of bivalence for future contingents. Many philosophers maintain that bivalence is compatible with an open future. They claim that the open future intuition can be accommodated without rejecting bivalence. If openness of the future just amounted to failure of bivalence for future contingents, we would need to come up with some explanation for what intuition these theorists claim to accommodate. I think it is best to assume at the outset that the view that there is an openness asymmetry between the past and the future is not merely the view that future contingents lack truth-value, and leave open the possibility that a rejection of bivalence for future contingents may end up being a consequence of the best way of accommodating the openness asymmetry.

Perhaps the openness of the future is best understood as the claim that the future is indeterministic: the way the world will be is not nomically necessitated by the current state of the world. Perhaps the future is open at time t just in case the state of the world at t and the laws of nature are compatible with multiple futures.

¹ In "The Open Past" (1995) Ned Markosian defines the openness of the future in terms of the failure of bivalence for future contingent statements. He states, "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" (96). In "Aristotelian Indeterminacy and the Open Future" J. R. G. Williams begins by writing, "I explore the thesis that the future is *open* in the sense that future contingents are neither true nor false." In both cases the authors may be merely stipulating how they plan to use the phrase 'the future is open' rather than making the further claim that such an account captures the ordinary intuition that the future is open.

Again, this way of characterizing the open future intuition seems problematic. First, the open future intuition seems largely independent of views about whether the world is deterministic or indeterministic. It seems that even if our world turned out to be deterministic, we would maintain that there is an asymmetry in openness between the past and the future.² Secondly, if our world is indeterministic, then the current state of the world and the laws are compatible with multiple futures. However, given indeterminism, the current state of the world and the laws are also compatible with multiple pasts. So indeterminacy alone fails to accommodate the *asymmetry* in openness between the past and the future.³

I think our notion of an asymmetry in openness between the past and the future is tied to an asymmetry in what we can affect or have power over. We take ourselves to have power over the future, yet lack power over the past. There is no use crying over spilt milk because once it has happened, there is nothing we can do about it (except clean it up of course). In contrast, we take it to be (partially) within our power whether or not future milk is spilled. Many philosophers argue that certain features are incompatible with an open future by arguing that such features entail that we are powerless over certain future events: Tooley (1997, 43-48) considers an argument that threatens our power over whether nuclear war takes place. Diekemper (2007) considers an argument that threatens our power over whether a Third World War takes place. Markosian (1995), in a less calamitous vein, considers an argument that threatens Joe Montana's power over his future lunch. Numerous philosophers have considered arguments against the open future that threaten our power over whether a future sea battle takes place. The fact that so many have considered arguments against the open future by considering arguments that threaten our power over future events strongly suggests that such power is constitutive of our pre-theoretical understanding of openness.⁴

² However in response one could claim that in such a case our openness intuition would be simply mistaken.

³ This point is made in Lewis (1986b, 37). Markosian (1995) also notes this consequence of appealing to indeterminacy to argue for the openness of the future and concludes that the defender of an open future who appeals to indeterminacy should grant that the past is also open.

⁴ It might be objected that this leads to an understanding of the open future that is objectionably agent-centered. Wasn't there an asymmetry in openness between the past and the future prior to the existence of any agents? Perhaps a convincing case can be made for the claim that the asymmetry in openness is ultimately an agent-centered notion. It may also be that our pre-theoretic notion of an asymmetry in openness between past and future is somewhat of a hodgepodge of various notions considered in this section.

3. Future Ontology

One of the questions I will consider is the relation between the open future and future ontology. In this section, I provide a brief overview of the main positions regarding the ontological status of the future.

Does the future exist? A natural response to this question is that the future does not exist *now*, but it *will* exist. With respect to this response, most philosophers are in agreement. Nonetheless, philosophers of time believe that there is a different sense of the question that leads to a more controversial response. Does the future exist in the sense that future objects and events are in the domain of the most unrestricted existential quantifier? If we were to ask God for a list of everything that exists, would the list contain future events such as my first squash victory and future objects such as my biofuelled jet? Let us follow Markosian (2008) in calling this the *ontological sense* of ‘exist’.

Some philosophers claim that the correct answer to the question ‘Does the future exist in the ontological sense?’ is ‘No’. The presentist maintains that the only objects and events that exist are presently existing objects and events.⁵ Future objects and events do not exist in the sense of being in the domain of the most unrestricted existential quantifier. The growing block theorist agrees with the presentist in denying the existence of future objects and events, but she maintains that past objects and events, such as dinosaurs and the U.S. Civil War, exist in addition to present objects and events.⁶ According to the growing block theorist, the entire sum of reality increases from one moment to the next: the total sum of reality currently does not include tomorrow’s breakfast, but tomorrow it will.

Others claim that the correct answer to the question ‘Does the future exist in the ontological sense?’ is ‘Yes’. Future objects and events exist in the ontological sense. Those that answer ‘Yes’ can be further classified into two groups. Let us call the event of me currently typing ‘TYPING’. If future events exist, then presumably TYPING is spatiotemporally related to such events. Are there events that are later than TYPING and part of distinct futures? Or are

⁵ Some defenses of presentism include Bourne (2006), Cameron (2011), Crisp (2003), (2007), Diekemper (2005), (2007), Markosian (2003), and Zimmerman (1996), (forthcoming).

⁶ Some defenses of the growing block theory include Broad (1923), Earman (2008), Forrest (2004), and Tooley (1997).

all the future events with which TYPING is spatiotemporally related part of the same future? Is TYPING spatiotemporally related to a future containing my first squash victory and also spatiotemporally related to a distinct future in which I never win a game of squash? Let us reserve the name ‘the block theory’ for the view that there exist future events with which present events like TYPING are spatiotemporally related and all such events are part of the same future.⁷ Let us reserve the name ‘the branch theory’ for the view that there exist at least two events, e1 and e2, with which present events like TYPING are spatiotemporally related and 1) e1 and e2 are both later than the present event and 2) e1 and e2 belong to distinct futures.^{8,9} Both the defender of the block theory and the defender of branch theory answer ‘Yes’ to the question about whether future objects and events exist in the ontological sense, however they disagree with respect to whether events like TYPING are spatiotemporally related to one future or many.

4. Future Contingents and Future Ontology

Is there a single determinate future? Before answering, care must be taken in determining what question is being asked. One way we might understand the question is in the ontological sense: does a single determinate future exist in the domain of our unrestricted existential quantifier? As we saw in the section above, the presentist and the growing block theorist answer ‘No’ to this question. But it seems that the presentist and the growing block theorist can maintain that there is a sense in which we have a single determinate future. They could maintain that there is one determinate way that the future will go without being ontologically committed to future objects and events. How can we make sense of this positive answer without understanding it in the ontological sense?

I suggest that we can understand the presentist’s or the growing block theorist’s claim that we have a single determinate future in terms of determinate truth about the future. What do we mean by *determinate* truth? Certain statements are definitely true such as the statement that Berlin is more than 100 kilometers from Madrid or the statement that the Libyan flag is green. Such statements can be contrasted with statements whose truth-value seems less definite, such as

⁷ Some defenses of the block theory include Lewis (1976), (1986b), Mellor (1998), Sider (2001), Smart (1963), and Williams (1953).

⁸ Obviously this is not meant as an *account* of the branch theory, but as an elucidation of the difference between it and the block theory. To see how one might provide a rigorous formulation of the branch theory see Belnap (1992).

⁹ Some defenses of the branch theory include Belnap (1992), (2005), MacFarlane (2003), (2008), and McCall (1994).

the statement that Barcelona is close to Madrid or the statement that the Statue of Liberty is green. How we should understand the truth-value of such statements is a source of much controversy. Some have suggested that although such statements are either true or false, they are not *determinately* true or *determinately* false. Others deny that statements can be true yet not determinately true: for a statement to be true just is for a statement to be determinately true. Fortunately, we need not settle the controversy here. In what follows I will understand the notion of having a single determinate future in terms of determinate truths about the future, while remaining noncommittal about whether there is a gap between truth and determinate truth. Those who take there to be such a gap will take my use of ‘determinate’ in the ensuing discussion of determinate truths about the future to be substantive, whereas those who deny such a gap will take this usage to be redundant. The issue of truth versus determinate truth will become important in section 8 below.

I propose that we understand the question ‘Is there a single determinate future?’ as a question about the determinate truth of future contingent propositions: ‘Do all future contingent propositions have a determinate truth-value?’¹⁰ Note that the presentist and the growing block theorist can answer ‘Yes’ to this question despite the fact that they deny that the future exists in the ontological sense. To have determinate truth-values for future contingent propositions, it helps to have a future, but unless other assumptions are brought on board, it is not a requirement. Most presentists endorse determinate truth-values for past-contingent propositions: Most (all?) presentists maintain that the proposition expressed by ‘Dinosaurs once roamed the Earth’ is determinately true even though, according to them, no past objects and events exist. So it seems that the presentist and the growing block theorist could defend a similar position with respect to future contingent propositions: they have a determinate truth-value despite the fact that future objects and events fail to exist. Whatever story the presentist appeals to in order to explain the truth or falsity of past-contingent propositions (presently existing truth-makers, ersatz times, rejection of truthmaker principles) a similar story might be given to defend the determinate truth

¹⁰ The choice to state the question in terms of whether or not future contingent *propositions* have a determinate truth-value is motivated by a desire to avoid complications concerning whether or not future contingent *statements* have indeterminate truth-value because of facts about the metaphysics of time or whether they have indeterminate truth-value because of facts about vagueness in language. Of course, for one who believes that propositions themselves can be vague, stating the question in terms of future contingent propositions, rather than statements, will fail to avoid this complication. Thanks to Ross Cameron for raising these issues.

or falsity of future contingent propositions.¹¹ So it seems that there is a way of understanding ‘Do we have a single determinate future?’ that allows for a positive answer despite answering negatively to the question of whether the future exists in the ontological sense.

It seems that the block theorist would be hard-pressed to deny that all future contingent propositions have a determinate truth-value. The block theorist who maintains that future objects and events determinately exist will most-likely marshal this future ontology to ground the truth of future-contingent propositions. For example, the block theorist can maintain that the statement ‘there will be a sea battle tomorrow’ when uttered today expresses a true proposition just in case there exists a sea battle one day after today. A positive answer to the question ‘Do all future contingent propositions have a determinate truth-value?’ follows from the block theorist’s ontology plus a plausible account of the truth-conditions for future contingent propositions.¹²

What should the branch theorist say about whether there exists a single determinate future? Considering this question opens the door to two different versions of the branch theory. One version of the branch theory maintains that all future branches are ontologically on par. The future branch in which there is a sea battle tomorrow is of the same kind as the future branch in which there is no sea battle tomorrow. One way of understanding truth for future contingent statements according to this version of the branch theory is in terms of a supervaluationist semantics.¹³ A future contingent statement is true at a time *t* just in case it is true at all the branches that include *t*. A future contingent statement is false at a time *t* just in case it is false at all the branches that include *t*. If there are some future branches in which there is a sea battle one day after today and other branches in which there is no sea battle one day after today, then an utterance today of ‘There will be a sea battle tomorrow’ is neither true nor false.

The method of supervaluation provides an account of how the branch theorist might understand the truth-value of future contingent *statements*, however what might the branch theorist who adopts such a semantics say about the truth-value of future contingent *propositions*?

¹¹ For some ways in which a presentist might attempt to explain the truth or falsity of past-contingent propositions see Bigelow (1996), Bourne (2006), Cameron (2010), Crisp (2007), and Merricks (2007, chapter 7).

¹² If there is a difference between truth and determinate truth, then this claim can be challenged. A block theorist who endorses such a difference may claim that future ontology commits one to maintaining that future contingents have a truth-value, but does not commit one to maintain that they have a determinate truth-value. See Barnes and Cameron (2009).

¹³ I have in mind here the type of semantics proposed by Thomason (1970). Such a semantics for branching time is also discussed in MacFarlane (2008).

A natural thought is that ‘There will be a sea battle tomorrow’ fails to express a unique proposition since the referent of ‘tomorrow’ has an indeterminate reference. Alternatively, the branch theorist might grant that the statement ‘There will be a sea battle tomorrow’ expresses a unique proposition, but that proposition is indeterminate in truth-value. Regardless of which of these options she adopts, it would be odd for the branch theorist who accepts a supervenient semantics for future contingent statements to claim that although the statement ‘There will be a sea battle tomorrow’ has an indeterminate truth-value, it expresses a unique proposition with a determinate truth-value. A more promising view for such a branch theorist is to deny that all future contingent propositions have a determinate truth-value.

A different version of the branch theory denies that all future branches are ontologically on par. According to this version of the branch theory, one of the futures is in some way privileged over the others as if it were marked out by a “thin red line”.¹⁴ Thin red line versions of the branch theory can maintain that all future contingent propositions have a determinate truth-value. A future contingent statement is true at a time *t* just in case the proposition it expresses is true in the branch that is marked out as the thin red line. A future contingent statement is false at time *t* just in case the proposition it expresses is false in the branch that is marked out as the thin red line. So it seems plausible to maintain that according to the thin red line theory there is a single determinate future, namely the one that is picked out by the thin red line.

5. OF-Compatibilism versus OF-Incompatibilism

I think the following question lies at the heart of the debate over the open future: Is an open future compatible with the fact that there is a single determinate future? The first group, let us call them ‘OF-compatibilists’, answers ‘Yes’. They maintain that the openness of the future is compatible with the fact that all future contingent propositions have a determinate truth-value. The second group, let us call them ‘OF-incompatibilists’, answers ‘No’. They maintain that if all future contingent propositions have a determinate truth-value, then the future is closed.

¹⁴ The ‘thin red line’ moniker is originally due to Belnap and Green (1994). Depending on how one construes the thin red line, it may be that a thin red line theory fails to count as a branch theory as I’ve described it above. On my characterization, a theory is a branch theory if a present event is spatiotemporally related to distinct futures. But a thin red line theorist may wish to distinguish the future lying on the thin red line from the other futures by claiming that the other futures fail to be spatiotemporally related to present events. Such a thin red line view may look more like what I have called a block theory. Defenses of thin red line views of various stripes include Borghini and Torrenco (forthcoming), Garcia-Carpintero (forthcoming), and Øhrstrøm (2009).

Many seem to hold an intuition that favors OF-incompatibilism: if there is a single determinate future, then how can the future be *genuinely open*? If facts about the future are now determinately true or false, then, aren't we, in some sense, locked in to this future? Jan Łukasiewicz seems to assume OF-incompatibilism when he writes:

I can assume without contradiction that my presence in Warsaw at a certain moment of next year, e.g. at noon on 21 December, is at the present time determined neither positively or negatively. Hence it is *possible*, but not *necessary*, that I shall be present in Warsaw at the given time. On this assumption the proposition 'I shall be in Warsaw at noon on 21 December of next year' can at the present time be neither true nor false. For if it were true now, my future presence in Warsaw would have to be necessary, which is contradictory to the assumption. If it were false now, on the other hand, my future presence in Warsaw would have to be impossible, which is also contradictory to the assumption. Therefore the proposition considered is at the moment *neither true nor false...*(Łukasiewicz 1967, 53)

Regarding Jake's utterance of 'There will be a sea battle tomorrow', John MacFarlane asks rhetorically, "But how can we give Jake's utterance a determinate true-value if the future is genuinely open at the time of utterance?" (MacFarlane 2003, 325). Michael Tooley gives voice to the intuition behind OF-incompatibilism when he writes, "...if someone has, at time t, the power to prevent its being the case that p, then it seems natural to say that it cannot be a fact, at time t, that p obtains. What can be prevented at a given time is not yet a fact at that time. So while it is now a fact that no nuclear war took place in 1986, it was not a fact in 1980 that no nuclear war took place in 1986" (1997, 44-45).

How does the OF-compatibilist respond to these challenges? A natural response on behalf of the OF-compatibilist is to claim that the challenger has confused what *will* be the case with what *must* be the case. According to this response, the question about whether the future is open is a modal question: to claim that the future is open is to claim, at least in part, that much of what will happen is not inevitable; some of what *will* happen, is not such that it *must* happen. According to the OF-compatibilist, it is either the case that there will be a sea battle tomorrow or the case that there will not be a sea battle tomorrow. Furthermore, it is either now true that there

will be a sea battle tomorrow or now false that there will be a sea battle tomorrow. However it doesn't follow from these facts that it is inevitable, inexorable, fixed, or necessary that there will be (or will not be) a sea battle tomorrow. The OF-compatibilist will maintain that the fact that the future is open with respect to sea battles is compatible with the fact that the proposition that there will be a sea battle tomorrow now has a determinate truth value.

To further illustrate an OF-compatibilist position, let us consider one such account put forth by David Lewis. Lewis is a block theorist and he claims that the asymmetry in openness between the past and the future amounts to an asymmetry in counterfactual dependence between the past and the future. Lewis states, "I suggest that the mysterious asymmetry between open future and fixed past is nothing else than the asymmetry of counterfactual dependence. The forking paths into the future—the actual one and all the rest—are the many alternative futures that would come about under various counterfactual suppositions about the present. The one actual, fixed past is the one past that would remain actual under this same range of suppositions" (1987, 38).

Central to Lewis's explanation of the openness asymmetry is the fact that the future depends counterfactually on the present in a way in which the past does not. If I were to drop my coffee mug now, the future state of my office floor would be different than it in fact will be. If a David Cameron scandal broke out today, the newspapers in the coming weeks would be different than they in fact will be. However, if I were to drop my coffee mug now, the past state of my office floor would be just as it in fact was. If a David Cameron scandal broke out today, the newspapers in the past weeks would be just as they in fact were.

What does it mean to claim that the asymmetry in openness between the past and the future "is nothing else than" the asymmetry in counterfactual dependence between the past and the future? According to Lewis, the future is open in virtue of the fact that the future counterfactually depends on what we do now. The past is closed or fixed in virtue of the fact that the past does not depend on what we do now. The future is open with respect to tomorrow's breakfast in virtue of the fact that tomorrow's breakfast depends, at least in part, on what I do now: for example, whether or not I now go to the store and buy porridge. I could now act in such a way that tomorrow's breakfast would be different than it in fact will be. But I could not now act in such a way that yesterday's breakfast would be different than it in fact was.

So, according to Lewis, in order for the future to be open with respect to some event, such as tomorrow's breakfast, the event must depend counterfactually on the present. Note that such an account is entirely compatible with it being determinately true now that I will have porridge for breakfast tomorrow morning. What is relevant to openness is not determinacy of truth-value but rather whether the right sort of counterfactual dependence holds.¹⁵

6. OF-Compatibilism and Genuine Possibility

Various criticisms have been levelled against OF-compatibilist accounts of the open future. John MacFarlane rejects versions of OF-compatibilism on the grounds that such views do not allow for the genuine possibility of alternative futures. In "Future Contingents and Relative Truth" he claims that in order to accommodate the intuition that the future is open, we should adopt a branching theory according to which there exist many branching futures all of which are ontologically on par. MacFarlane considers and rejects two metaphysical accounts of the future: the thin red line view and a diverging worlds view. The thin red line view that MacFarlane considers is a OF-compatibilist position: it maintains that the future is open, yet it claims that there is now a single determinate future (namely the future marked out by the thin red line). However, MacFarlane thinks that positing a thin red line amounts to giving up on the claim that the future is open. He states it as follows:

The non-red branches in the tree are supposed to represent objective possible futures, but their non-redness indicates precisely that they will not be the continuations of the history that includes the utterance in question. Looking down on the tree of branching histories from above, God can see that given the past and the context of utterance, only one continuation remains in play: the one marked with the thin red line. In what sense, then, are the others really 'possibilities'? They are possible in an epistemic sense: the utterer does not know which history is marked out with the thin red line. But objectively speaking they are not genuine possibilities at all (325).

¹⁵ There are, of course, a number of important and controversial issues concerning Lewis's account that I am ignoring, such as whether Lewis's analysis of counterfactuals in terms of closeness of worlds succeeds in delivering the kind of asymmetry of counterfactual dependence that is constitutive of openness on his account. See Lewis (1986b), Bennett (1984) and Wasserman (2006) for some of the relevant literature.

MacFarlane claims that the metaphysical view endorsed by David Lewis is susceptible to the same criticism. Lewis rejects branching in favour of divergence. Lewis maintains that present events like TYPING are spatiotemporally related to only one future; however there exist concrete worlds, which are spatiotemporally unrelated to the actual world. Such worlds contain world segments that are qualitative duplicates of the actual world up until the present time, however they contain futures that differ qualitatively from the future that we are spatiotemporally related to (in this sense, they diverge from the actual world).¹⁶ MacFarlane states:

Given a context of utterance, there is only one possible future history that contains it; the future is in that sense determined. Granted there are other possible worlds that are qualitative duplicates of the actual world up to the present and diverge thereafter, but these worlds contain different utterances (and utterers) mere ‘counterparts’ of the actual ones. Thus the future is open only in the sense that we do not (and perhaps cannot) know what it will bring (2003, 326).

MacFarlane argues that the commitment to the existence of a single determinate future, either one picked out by the thin red line, or a single future that is part of our world, means giving up on genuine openness with respect to the future. MacFarlane claims that on either the thin red line view or the diverging worlds view the alternative futures are not genuine possibilities; they are possibilities only in the epistemic sense.

Exactly why do these alternative futures (either those of divergent worlds or those futures lying off the thin red line) fail to count as genuine possibilities? The thin red line theorist will claim, roughly, that a future branch is (genuinely) possible at t just in case it is one of the futures that contains t as part of its history. Similarly, the diverging worlds theorist will maintain that an

¹⁶ How does this diverging worlds picture of the open future connect up with Lewis’s account of the open future outlined above? When we consider whether the future is open with respect to tomorrow’s breakfast, for example, we consider whether tomorrow’s breakfast depends counterfactually on the present. To consider whether tomorrow’s breakfast depends counterfactually on the present, we consider the closest worlds in which I presently act in a different way than I actually do. Those will be worlds in which the past is qualitatively the same as the actual past yet differ qualitatively with respect to the future. Hence the account of openness asymmetry in terms of counterfactual asymmetry, together with the Lewisian analysis of counterfactuals and his commitment to concrete possible worlds, results in a diverging worlds account.

alternative future is (genuinely) possible at t just in case it is part of an accessible possible world that exactly matches the actual world up to t . MacFarlane rejects these analyses of what it is for an alternative future to count as a genuine possibility but it is unclear why he rejects them. Regarding the thin red line theorist, he states, “non-red branches in the tree are supposed to represent objective possible futures, but their non-redness indicates precisely that they will not be the continuations of the history that includes the utterance in question” (325). This passage seems to draw a conclusion about whether a given branch represents an objective possible future from the fact that a branch *will* not be a continuation of the history that includes the actual utterance of ‘there will be a sea battle tomorrow’. The thin red line theorist should reject this inference: from the fact that a future branch *will* not be a continuation of the history that includes the actual utterance of ‘there will be a sea battle tomorrow’, it does not follow that the future is not a genuine possibility.

In MacFarlane’s criticism of the diverging worlds account, he recognizes that the diverging worlds theorist will posit “other possible worlds that are qualitative duplicates of the actual world up to the present and diverge thereafter” but he claims that these duplicate possible worlds contain “different utterances (and utterers) mere ‘counterparts’ of the actual ones” (2003, 326). From this he concludes that such diverging futures are possibilities merely in the epistemic sense. But again it is unclear why this conclusion is supposed to follow from the fact that the alternative futures contain counterpart utterances and utterers of the actual ones. Joseph Diekemper objects to a diverging worlds account on similar grounds claiming, “the possibility of an alternate history containing an alternate future is not a possibility *for me*” (443, 2007).

These objections to OF-compatibilist positions raise an interesting question: What metaphysical account is required in order for it to be *genuinely possible* for me to have porridge for breakfast tomorrow? One way of responding to this question is to claim that in order for a possible future to be a genuine possibility for me, I must literally be part of that future. Having porridge for breakfast tomorrow is only a genuine possibility for me if there is some future in which I, myself, have porridge for breakfast tomorrow. An alternative way of responding is to claim that in order for a possible future to be a genuine possibility for me, it must succeed in representing me as being part of that future, but I need not literally be part of that future.

It should be noted that very few philosophers maintain that in order for a possibility to count as a genuine possibility for me I must literally be part of that possibility. Only the modal

realist who posits overlap between worlds could make good on the demands placed by such a requirement.¹⁷ Almost all existent accounts of *de re* modality hold that genuine possibility involves some sort of representation that does not require that the *res* is literally part of the possibility. Both modal realism that rejects overlap and the various versions of ersatzism deny that in order for something to count as a genuine possibility for me, I must literally be part of that possibility.

7. The Open Future and Branching

As mentioned above, MacFarlane endorses the branch theory according to which all future branches are ontologically on par. He maintains that only on such an account is the future genuinely open. A branching theory has also been endorsed by Storrs McCall (1994) and Belnap, Perloff, and Xu (2001). According to such a view, tomorrow is open with respect to sea battles in virtue of the fact that there exist future branches in which a sea battle takes place and future branches in which no sea battle takes place, and there is nothing that ontologically privileges one branch over any other. The asymmetry in openness between the past and the future is grounded in an ontological asymmetry between the single trunked past and a multitude of branching futures.

In response to attempts to accommodate the open future by positing multiple branching futures, I think two main questions are worth considering. I will do little more than raise the questions here. First, is such an account required in order to accommodate open future intuitions? Or can the open future intuition be reconciled with a single, non-branching, future? If the open future can be accommodated by positing a single, non-branching future, then multiple branching futures are not motivated by open future considerations alone. The considerations in the previous section bear directly on this question. If a diverging worlds account involving either genuine or ersatz worlds succeeds in providing for genuine future possibilities, then it seems like the move towards multiple branching futures is unmotivated on open future considerations alone.¹⁸

¹⁷ See McDaniel (2004) for a formulation of a version of modal realism with overlap.

¹⁸ Nonetheless there might be independent good reasons for positing multiple branching futures. An Everett or Many-Worlds interpretation of quantum mechanics posits multiple branching futures and many regard such an interpretation as the best on offer.

The second question worth considering is whether positing multiple branching futures even succeeds in accommodating the open future intuition. Does positing multiple branching futures provide the right kind of metaphysical framework for making sense of our beliefs about the future? David Lewis argues that multiple branching futures make nonsense out of our ordinary beliefs about the future. He states, “The trouble with branching exactly is that it conflicts with our ordinary presupposition that we have a single future. If two futures are equally mine, one with a sea fight tomorrow and one without, it is nonsense to wonder which way it will be—it will be both ways—and yet I do wonder. The theory of branching suits those who think this wondering is nonsense” (1986, 207-208).

Lewis’s objection to branching relies on a number of assumptions. One assumption is that if there are multiple branching futures, then it does not make sense to wonder which of the branching futures will be mine. This seems to be a particular consequence of Lewis’s metaphysics of persons and his accompanying account of what a subject’s attitudes about the future should be given this metaphysics of persons (See his “Survival and Identity” and the accompanying postscript in (1983)). The assumption that positing multiple branching futures makes nonsense of wondering about the future can be, and has been challenged (see Belnap, Perloff, and Xu (2001) and Saunders and Wallace (2008)). It remains very much an open question whether the branching theory can indeed make good on the open future intuition.

8. The Open Future and Metaphysical Indeterminacy

Recently a different sort of OF-incompatibilist account has been proposed by Elizabeth Barnes and Ross Cameron. Barnes and Cameron maintain that a single determinate future is incompatible with an open future, however they locate the incompatibility of openness with the future’s being *determinate*. According to Barnes and Cameron, “truth is one thing and determinate truth another” (298). They uphold bivalence for future contingents: they maintain that the proposition that there will be a sea battle tomorrow is either true or false (“those are the only two options” (294)). However they deny that all future contingent propositions are determinately true or determinately false.

According to Barnes and Cameron, the type of indeterminacy characteristic of the future is metaphysical indeterminacy. Metaphysical indeterminacy differs from other accounts of indeterminacy such as semantic indeterminacy and epistemicism in that it locates indeterminacy

in the world as opposed to in language or rooted in our ignorance of the world.¹⁹ Suppose that Ralph is a borderline case of being bald. Consider the following sentence:

(B) Ralph is bald.

Semantic indeterminacy maintains that the predicate ‘is bald’ lacks precise application conditions. (B) is indeterminate in virtue of the fact that nobody has ever bothered to decide whether ‘bald’ applies to certain borderline cases. On many accounts of semantic indeterminacy, (B) is neither true nor false.²⁰ According to epistemicism, there are precise application conditions for the predicate ‘is bald’, and therefore (B) is either true or false, but we are ignorant about what the application conditions of the predicate are and therefore ignorant about what truth-value (B) has. The metaphysical indeterminist under consideration agrees with the epistemicist that (B) is either true or false, but denies that indeterminacy is explainable entirely in terms of our ignorance of the application conditions for vague terms.²¹ Rather, a metaphysical indeterminacy account of (B) claims that the world is indeterminate or unsettled with respect to Ralph’s baldness. Although (B) is either true or false (since those are the only options), it is metaphysically indeterminate which truth-value (B) has. Our ignorance of the truth-value of (B) is a consequence of its being metaphysically indeterminate whether (B) is true or false.

Barnes and Cameron suggest using this model of indeterminacy to explain the intuitive asymmetry in openness between the past and the future. The asymmetry in openness between the past and the future amounts to an asymmetry in metaphysical determinacy between the past and the future. Whereas the proposition that I had porridge for breakfast this morning presently has a determinate truth-value, the proposition that I will have porridge for breakfast tomorrow morning presently lacks a determinate truth-value. As time passes, more and more propositions acquire determinate truth-values.

Barnes and Cameron take the open future thesis to be the thesis that “contingent facts about how things will be are presently unsettled” (2009, 291). They claim that this thesis can be upheld by taking the future to be metaphysically indeterminate. However, the OF-compatibilist will deny that the move to metaphysical indeterminacy is necessary in order to uphold the open

¹⁹ For detailed discussion of metaphysical indeterminacy more generally, as well as arguments for and against, see Williams (2008) and Barnes (forthcoming).

²⁰ There are also accounts of semantic indeterminacy that uphold bivalence and therefore maintain that (B) is either true or false. See, for example, Fara (2000).

²¹ Although the account of metaphysical indeterminacy under consideration in this section upholds bivalence, there are other accounts of metaphysical indeterminacy that reject bivalence.

future thesis. The OF-compatibilist will reply that she can make sense of the claim that how things will be are presently unsettled without denying that there are determinate truths about the future. The fact that the future is presently unsettled is captured by the fact that contingent facts about how things will be are dependent upon what we do now. And this dependency of future facts on what we do now is entirely compatible with determinate truths about the future.

9. Conclusion: Something more?

We began by considering the ordinary intuition that there is an asymmetry in openness between the past and the future. As I have tried to show, there is an interesting divide between the parties in the open future debate. The OF-compatibilists claim to make good on the open future intuition by pointing out that there is a single determinate future, however that future's existence depends on our present actions: there are various alternative futures that would come about if we were to presently act differently. The OF-incompatibilist wants something more: the OF-compatibilist's alternate futures, whether they are part of concrete diverging worlds, ersatz constructions, or branching futures lying off of the thin red line, are cold comfort for the OF-incompatibilist: a single determinate future is sufficient to undermine the notion that the future is genuinely open. This leaves us with some weighty questions: What, if anything, do the OF-compatibilist positions fail to deliver? What part of the open future intuition fails to be captured by what the OF-compatibilist offers? Do her alternative futures fail to count as genuine possibilities? If so, why? What is required in order for a future to count as a genuine possibility? These are some of the questions that need to be addressed in order for the debate between OF-compatibilists and the OF-incompatibilists to move beyond a stalemate.²²

²² In writing this article, I received support from the Spanish Ministry of Science and Innovation's project *Philosophy of Perspectival Thoughts and Facts* (PERSP), CONSOLIDER-INGENIO 2010 CSD2009-00056 and from the Spanish Ministry of Science and Innovation's I+D+i projects *Vagueness, Physics, Metaphysics and Metametaphysics* (FFI2008-06153) and *Semantic Content and Context Dependence* (FFI2009-13436). I would also like to thank Ross Cameron, Antony Eagle, and an anonymous referee from *Philosophy Compass* for helpful comments on earlier drafts.

References

- Barnes, E and Cameron, R. (2009) 'The Open Future: Bivalence, Determinism and Ontology' *Philosophical Studies* 146:291–309.
- Barnes, E. (forthcoming) 'Ontic Vagueness: A Guide for the Perplexed' *Nous* 44 (4), 601-627.
- Belnap, N. (1992) 'Branching Space-Time.' *Synthese* 92.3, 385-434.
- Belnap, N. and Green, M. (1994) 'Indeterminism and the Thin Red Line' in J. Tomberlin (ed.) *Philosophical Perspectives 8: Logic and Language*, Atascadero: Ridgeview, 365-388.
- Belnap, N., Perloff, M. and Xu, M. (2001) *Facing the Future: Agents and Choices in our Indeterminist World* Oxford: Oxford University Press.
- Belnap, N. (2005) 'Agents and Agency in Branching Space-times' *Logic, Thought and Action*, Daniel Vanderveken (ed.), Dordrecht: Springer, 291-313.
- Bennett, J. (1984) 'Counterfactuals and Temporal Direction' *The Philosophical Review* 93, 57-91.
- Bigelow, J. (1996) 'Presentism and Properties', in James E. Tomberlin, ed., *Philosophical Perspectives*, 10, Metaphysics, Cambridge, Massachusetts: Blackwell, 35-52.
- Borghini, A and Torrenco, G. (forthcoming) 'The Metaphysics of the Thin Red Line' in F. Correia and A. Iacona (eds.), *Around the Tree*, Kluwer, Synthèse Library: Dordrecht.
- Bourne, C. (2006) *A Future for Presentism*, Oxford: Oxford University Press.
- Broad, C. D. (1923) *Scientific Thought*, New York: Harcourt, Brace and Co.
- Cameron, R. (2011) 'Truthmaking for Presentists' in Zimmerman, Dean (ed.), *Oxford Studies in Metaphysics Vol.6*, Oxford: Oxford University Press, 55-100.
- Crisp T. (2003) 'Presentism' in *The Oxford Handbook of Metaphysics*, Michael Loux and Dean Zimmerman eds., Oxford: Oxford University Press, 211-245.
- Crisp, T. (2007) 'Presentism and Grounding' *Nous* 41:1, 90-109.
- Diekemper J. (2005) 'Presentism and Ontological Symmetry' *Australasian Journal of Philosophy* 83:2, 223-40.
- Diekemper, J. (2007) 'B-Theory, Fixity and Fatalism', *Nous* 41:3, 429-452.

- Earman, J.(2008) ‘Reassessing the Prospects for a Growing Block Model of the Universe’ *International Studies in the Philosophy of Science*, 22:2, 135 – 164.
- Fara, D. G. (2000) ‘Shifting Sands: An Interest-Relative Theory of Vagueness’, *Philosophical Topics* 28(1): 45–81. Originally published under the name "Delia Graff".
- Forrest, P. (2004) ‘The Real but Dead Past: A Reply to Braddon-Mitchell’, *Analysis* 64: 358-62.
- Garcia-Carpintero, M. ‘Relativism, the Open Future and Propositional Truth’ in F. Correia and A. Iacona (eds.), *Around the Tree*, Kluwer, Synthèse Library: Dordrecht.
- Lewis, D. (1983) ‘Survival and Identity’ plus postscripts in his *Philosophical Papers, I*, Oxford: Oxford University Press, 55-77.
- Lewis, D. (1986a) *On the Plurality of Worlds*, Oxford: Blackwell Publishers.
- Lewis, D. (1987) ‘Counterfactual Dependence and Time’s Arrow’ plus postscripts in his *Philosophical Papers, 2*, 32-66.
- Łukasiewicz, J. (1967) ‘Philosophical Remarks on Many-Valued Systems of Propositional Logic’, in *Polish Logic 1920-1939*, ed. Storrs McCall, Oxford: Clarendon, 40-65
- Markosian, N. (1995) ‘The Open Past’ *Philosophical Studies* 79, 95-105.
- Markosian, N. (2003) ‘A Defense of Presentism’ in Zimmerman, Dean (ed.), *Oxford Studies in Metaphysics, Vol. 1* Oxford: Oxford University Press, 47-82.
- Markosian, N. (2008) ‘Time’ *Stanford Encyclopedia of Philosophy*, Edward N. Zalta (ed.), URL = <<http://plato.stanford.edu/entries/time/>>
- MacFarlane, J. (2003) ‘Future Contingents and Relative Truth’ *The Philosophical Quarterly* 53, 321-336.
- MacFarlane, J. (2008) ‘Truth in the Garden of Forking Paths’ in *Relative Truth*, ed. Max Kölbel and Manuel García-Carpintero, Oxford: Oxford University Press, 81–102.
- McCall, S. (1994) *A Model of the Universe*, Oxford: Oxford University Press.
- McDaniel, K. (2004) ‘Modal Realism with Overlap’ *Australasian Journal of Philosophy* 82 (1):137 – 152.
- Mellor, D. H. (1998) *Real Time II*, London: Routledge.
- Merricks, T. (2007) *Truth and Ontology*, Oxford: Clarendon Press.

- Øhrstrøm, P. (2009) 'In Defense of the Thin Red Line' *Humana.mente 8 - Models of Time*, 17-32.
- Saunders, S. and Wallace, D. (2008) 'Branching and Uncertainty' *British Journal for the Philosophy of Science*, 59:293-305.
- Sider, T. (2001) *Four Dimensionalism: An Ontology of Persistence and Time*, Oxford: Oxford University Press.
- Smart, J. J. C. (1963) *Philosophy and Scientific Realism*. London: Routledge & Kegan Paul.
- Thomason, R. (1970) 'Indeterminist time and truth-value gaps' *Theoria*, 3, 264-281.
- Tooley, M. (1997) *Time, Tense and Causation*, Oxford: Clarendon.
- Wasserman, R. (2006) 'The Future Similarity Objection Revisited' *Synthese* 150 (1), 57-67.
- Williams, D. C. (1951) 'The Myth of Passage' *Journal of Philosophy* 48, 457-472.
- Williams, J. R. G. (2008) 'Ontic Vagueness and Metaphysical Indeterminacy' *Philosophy Compass*, Volume 3, Issue 4, pages 763–788.
- Williams, J. R. G. (Unpublished) 'Aristotelian Indeterminacy and the Open Future'.
- Zimmerman, D. (1996) 'Persistence and Presentism' *Philosophical Papers*, 25, 115-126.
- Zimmerman, D. ((forthcoming) 'Presentism and the Space-Time Manifold.' *Oxford Handbook of Time..* C. Callender Ed. Oxford: Oxford University Press.