

# The Metaphysics of Ockhamism

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This paper investigates Ockhamism from a metaphysical point of view. Its main point is that the claim that future contingents are true or false is less demanding than usually expected, as it does not require particularly contentious assumptions about the future. First it will be argued that Ockhamism is consistent with a wide range of metaphysical views. Then it will be shown that each of these views leaves room for the claim that the future is open, at least on some plausible interpretations of that claim.

## 1 Preliminary clarifications

Ockhamism is the theory according to which future contingents are true or false, although they are neither determinately true nor determinately false. Its core idea is that truth and falsity depend on what happens in the actual future, while determinate truth and determinate falsity depend on what happens in all possible futures. Consider the following sentence:

- (1) There will be a sea battle tomorrow

According to Ockhamism, (1) as uttered today is true or false, for either the actual future is such that there will be a sea battle tomorrow or it is such that there will not be a sea battle tomorrow. This, however, does not mean that (1) as uttered today is determinately true or determinately false, because today is not settled whether there will a sea battle

tomorrow.<sup>1</sup>

From the logical point of view, Ockhamism is disarmingly simple. Most theories of future contingents reject bivalence, so they imply some sort of logical asymmetry between sentences about the future and sentences about the past. Ockhamism, instead, preserves bivalence and thereby logical symmetry between sentences about the future and sentences about the past. Consider (2) and (3):

(2) There is a sea battle

(3) There was a sea battle yesterday

According to Ockhamism, (1) is true as uttered today if and only if (2) is true as uttered tomorrow, and (2) is true as uttered tomorrow if and only if (3) is true as uttered the day after tomorrow, so (1) and (3) are related to (2) exactly in the same way. This specularity holds because (1) as uttered today, (2) as uttered tomorrow, and (3) as uttered the day after tomorrow describe one and the same fact, the way things will be tomorrow.

The aspect of Ockhamism that may easily be perceived as problematic, and is often perceived as problematic, is its reliance on the notion of the actual future. In the current debate on future contingents, Ockhamism is usually associated with *the thin red line*, the view according to which there are many possible continuations of the present — many branches that depart from the same trunk — and one of them is the actual future. This view has been widely discussed, especially for its implications on formal semantics, and the main problem that has been raised in connection with it is that it seems at odds with the claim that the future is open.<sup>2</sup>

Although the interest in Ockhamism has grown considerably in the last few years, and some arguments against the thin red line have been convincingly countered, it is still an open question whether the notion of the actual future is viable from a metaphysical point of view. The present work is intended to shed light on this question by dispelling some

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<sup>1</sup>Ockhamism goes back to Ockham [19], pp. 515-517. Øhrstrøm [20] provides a detailed presentation of Ockham's view.

<sup>2</sup>The expression 'thin red line' goes back to Belnap and Green [1]. The objection is expressed in various forms in McArthur [17], pp. 284-285, Belnap and Green [1], p. 381, Belnap, Perloff and Xu [18], p. 162, MacFarlane [13], pp. 325-326.

recurrent doubts about Ockhamism and pointing out some sources of confusion and misunderstanding.<sup>3</sup>

The first part of the paper suggests that there is no necessary connection between Ockhamism and the thin red line. As will be explained, Ockhamism is consistent with four distinct ontologies of time, and is neutral with respect to the divide between branching and divergence. The second part of the paper shows that each of the views considered in the first part is compatible with the claim that the future is open, at least on some plausible interpretations of that claim.

## 2 Presentism and the growing block theory

As is well known, there are four main views that one may hold about the existence of past, present, and future entities: presentism, the growing block theory, the shrinking block theory, and eternalism. This section is intended to show that Ockhamism is consistent with the first two views, while the next section will deal with the other two.

Presentism is the view according to which only present entities exist: past entities and future entities do not exist. Imagine an incredibly big and incredibly thin slice of salami. The slice is the present, and we are in it. Behind us there is nothing, because the past does not exist, and ahead of us there is nothing, because the future does not exist. Figure 1 illustrates the situation just described:

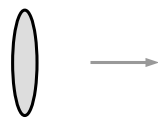


Figure 1: Presentism

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<sup>3</sup>Recently, Ockhamism has been elaborated and defended in Øhrstrøm [20], Rosenkranz [21], Iacona [8], Iacona [9], Wawer [25], Malpass and Wawer [15].

The growing block theory is the view according to which past and present entities exist but future entities do not exist. This view describes reality as a totality that increases as time goes by. Imagine, as before, that we are in a slice of salami. Behind us lies the past, the portion of salami that precedes the slice, while ahead of us there is nothing, as in figure 2.

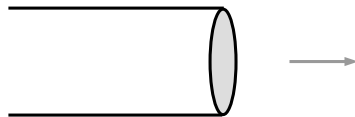


Figure 2: The growing block

The first impression one might have is that presentism and the growing block theory plainly contradict Ockhamism. If there is nothing ahead of us, how can future contingents be true or false in virtue of what happens in the actual future? It is no accident that some eminent advocates of presentism and the growing block theory have denied bivalence. However, this impression does not resist scrutiny. As will be suggested, it is conceivable that future contingents are true or false even if the future does not exist.

Let us focus on the growing block theory. According to Broad, who provided the first clear formulation of this theory, (1) is neither true nor false: since tomorrow has not yet come, there is presently no fact that could render (1) true or false. Despite Broad's denial, however, it is disputable that the growing block theory rules out bivalence. As Correia and Rosenkranz have argued, there is no principled reason to think that in order for (1) to be true, there has to be some present fact that makes it true. To think so is to rely upon an unjustified assumption about grounding, the assumption that in order for a sentence about the future to be presently true, its truth must *presently* be grounded in what there is and how it is. According to Correia and Rosenkranz, the

grounding requirement on truth should rather be phrased as follows: in order for a sentence about the future to be presently true, its truth must be grounded *in the future* by something being certain ways.<sup>4</sup>

Note that, if the grounding requirement on truth is phrased this way, it warrants the truth value link between (1) and (2) stated in section 1. Let us assume that (1) as uttered today is true just in case its truth is grounded in the way things will be tomorrow. Then (1) as uttered today and (2) as uttered tomorrow are grounded in the same fact. Therefore, it makes perfect sense to say that (1) is true as uttered today if and only if (2) is true as uttered tomorrow. Similar considerations hold for the truth value link between (2) and (3), if it is assumed that sentences about the past are presently true when they are grounded in the past.

Note also that, if the truth of a sentence about the future is grounded in the future, rather than in the present or in the past, its being grounded is clearly compatible with its being contingent. For example, if (1) is true as uttered today in virtue of something that will happen tomorrow, its truth is not rendered inevitable by how things located in the present or in the past now are or were. So, grounding does not entail necessitation.<sup>5</sup>

Similar considerations hold for presentism. Insofar as grounding is understood in the way suggested by Correia and Rosenkranz, presentism leaves room for the thought that the truth or falsity of (1) as uttered today depends on what will happen tomorrow. More generally, the presentist can say that sentences about the future are presently true when they are grounded in the future, and that sentences about the past are presently true when they are grounded in the past.

Once it is granted that presentism and the growing block theory do not rule out bivalence, it can be shown that Ockhamism is consistent with these two theories. To do so, it suffices to appeal to abstract entities that the presentist and the growing block theorist may easily be willing to accept. Let an *ersatz future* be defined as follows:

**Definition 1** *An ersatz future is a consistent and negation-complete set of sentences about the future.*

This is not a rigorous definition, of course, because it makes no reference to a specific language and does not provide a precise characterization of the relevant set of sentences. But at least it is reasonable to expect that

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<sup>4</sup>Broad [2], p. 73. Correia and Rosenkranz [3], pp. 110-116.

<sup>5</sup>Correia and Rosenkranz [3], pp. 116-121.

it can be converted into a rigorous definition, once the due technicalities are properly handled. To say that a set of sentences  $S$  is consistent is to say that there is no  $p$  such that  $S$  includes both  $p$  and  $\sim p$ . To say that  $S$  is negation-complete is to say that, for every  $p$ ,  $S$  includes either  $p$  or  $\sim p$ . In other words, for every sentence that describes a future state of affairs as obtaining,  $S$  includes either the sentence itself or another sentence that describes that state of affairs as not obtaining.<sup>6</sup>

Now let us assume that bivalence holds. Given definition 1, actuality can be defined in terms of truth:

**Definition 2** *An ersatz future is actual if and only if it contains only true sentences.*

If bivalence holds, the set of sentences about the future can be divided into two mutually exclusive and jointly exhaustive subsets, the true ones and the false ones. The set of the true ones is an actual ersatz future. As a matter of fact it is the only actual ersatz future, for if  $S$  and  $S'$  are both actual, it turns out that, for every  $p$ ,  $S$  includes  $p$  if and only if  $S'$  includes  $p$ , which means that  $S = S'$ .

The fact that there is a unique actual ersatz future suggests that, even if it is granted that the future does not exist, it may still be claimed that time is linear in some sense. Figure 3 illustrates this sense in the case of the growing block theory. The dashed lines indicate the actual ersatz future. They show that there is some sort of continuity between past, present, and future, although there is no continuity at the ontological level.

The same sort of linearity holds in the case of presentism, on the assumption that there is a unique actual ersatz past defined in the way considered. In figure 4, the dashed lines on the right indicate the actual ersatz future, while those on the left indicate the actual ersatz past.

It is easy to see that the Ockhamist definitions of truth and falsity hold in the framework just sketched. Let  $p$  be a sentence about the future. Then  $p$  is true if and only if it is true in the actual ersatz future, and  $p$  is false if and only if it is false in the actual ersatz future. So it turns out that future contingents are true or false.

Two final remarks. The first is that the ersatz story can hardly provide an explanation or a justification of Ockhamism. Ockhamism

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<sup>6</sup>This is one way to define an ersatz future, but there are other ways. An alternative definition could be given in terms of a set of propositions, or in terms of recombination of existing entities. Nothing essential will depend on this choice.

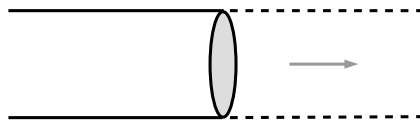


Figure 3: Past, present, and ersatz future

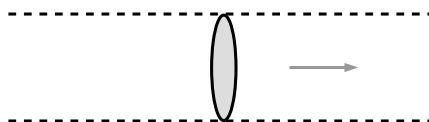


Figure 4: Ersatz past, present, and ersatz future

defines truth *simpliciter* in terms of truth in the actual future. Since in the ersatz story the actual future is nothing but the set of true sentences about the future, it turns out that truth in the actual future is defined in terms of truth *simpliciter*. So there is no explanatory or justificatory gain. However, note that our aim here is not that of offering an explanation or a justification of Ockhamism. The limited purpose of the reasoning just outlined is to show that Ockhamism is consistent with presentism and with the growing block theory, and for this purpose it suffices to show that the Ockhamist definitions of truth and falsity can be phrased in the way suggested.

The second remark is that, independently of Ockhamism, the theoretical costs of endorsing the ersatz story might be too high for the advocates of presentism or the growing block theory. “Ostrich” approaches along the lines suggested by Correia and Rosenkranz have been widely debated in the last few years, mainly in connection with the so-called grounding problem for presentism, and there is no general agreement on their tenability. For example, Torrenco questions such proposals, arguing that they posit an unreasonably high amount of brute facts, among other things. But again, it is not among the purposes of this paper to assess the pros and cons of each of the options considered.<sup>7</sup>

### 3 The shrinking block theory and eternalism

Since Ockhamism is consistent with presentism and the growing block theory, which entail that the future does not exist, *a fortiori* it is consistent with the shrinking block theory and eternalism, which entail that the future does exist. The shrinking block theory is the view according to which present and future entities exist but past entities do not exist. In figure 5, the slice of salami that represents the present is attached to the portion of salami that follows it, the future. Eternalism is the view according to which past, present, and future entities exist. In figure 6 the slice of salami that represents the present is part of a whole salami, a *history*, which may be conceived as a linearly ordered sequence of moments<sup>8</sup>.

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<sup>7</sup>Torrenco [24].

<sup>8</sup>While presentism, the growing block theory, and the shrinking block theory are essentially “dynamic”, in that they imply that the passage of time is metaphysically real, eternalism may be understood either dynamically, assuming that the present really moves along the line of time, or “statically”, assuming that the experience of



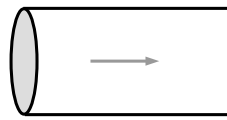


Figure 5: The shrinking block

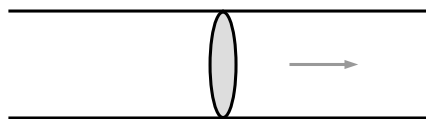


Figure 6: Eternalism

Ockhamism is consistent with the shrinking block theory and with eternalism because both views imply that there is a unique actual future, so they both accord with the idea that future contingents are true or false in virtue of the actual future. In figures 5 and 6, the portion of salami that follows the present may be conceived as the unique actual future. Therefore, it may be claimed that the truth or falsity of sentences about the future depends on what happens in that portion.

Note that the shrinking block theory leaves room for the existence of a unique actual ersatz past. So it is somehow analogous to the growing block theory: there is some sort of continuity between past, present, and future, although there is no continuity at the ontological level. Moreover, both the shrinking block theory and eternalism trivially include a unique actual ersatz future, in addition to the real actual future.

#### 4 Branching and divergence

So far it has been argued that the claim that future contingents are true or false is compatible with each of the four views outlined. However, this claim does not exhaust Ockhamism. The other claim to be considered is that future contingents are neither determinately true nor determinately false. Since determinate truth and determinate falsity depend on what happens in all possible futures, something has to be said about the possible futures that are not actual.

Possible futures may be conceived in different ways. In the case of presentism and the growing block theory, a natural way to go is to identify possible futures with ersatz futures, in accordance with definition 1. As we have seen, figures 3 and 4 show the unique actual ersatz future. What they do not show, however, is that the actual ersatz future is not the only ersatz future. Suppose that (1) is true as uttered today. Then (1) is part of the actual ersatz future. However, there are ersatz futures that do not include (1) but its negation. This fact can be described in terms of *truth in an ersatz future*, defined as follows:

**Definition 3** *A sentence about the future is true in an ersatz future if and only if it belongs to that future.*

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the passage of time is merely illusory. However, the difference between these two interpretations do not matter for our purposes.

Although (1) is true in the actual ersatz future, there are ersatz futures in which it is false. Note that truth in an ersatz future is not the same thing as truth *simpliciter*. Although truth *simpliciter* entails truth in the actual ersatz future, truth in an ersatz future does not entail truth *simpliciter*.

In the case of the shrinking block theory and eternalism, possible futures may be conceived as real entities that exist in the same sense in which the actual future exists, although it is not necessary to do so. The relation between the actual future and the other possible futures may be understood either in terms of *branching* or in terms of *divergence*. Here we will restrict consideration to eternalism in order to spell out these two options.

As we have seen, the view that is mostly associated with Ockhamism is the thin red line. According to this view, time branches into a plurality of possible futures. Each of these futures, together with the past and the present, forms a history. One of the possible futures is the actual future, and the history that includes it is the actual history. Figure 7 illustrates the thin red line. As in the previous figures, the slice is the present, the moment in which we are now, and the portion of salami behind us is the past. In front of us there are three portions of salami. The portion in the middle is the actual future. This future exists exactly in the same way in which the past and the present exist.

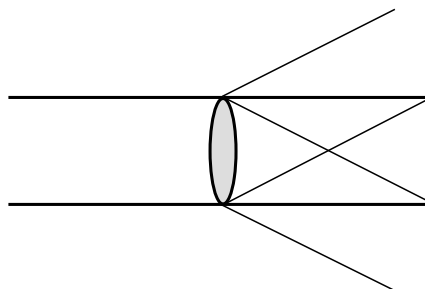


Figure 7: The thin red line

What about the other possible futures? Do they exist in the same way? This is less clear. According to the received version of the thin red line, the answer is affirmative: the only difference between the ac-

tual future and the other possible futures is that the actual future is actual. But the received version of the thin red line should not be taken as gospel, given that it has been framed by the worst enemies of Ockhamism, namely, *branching purists*. Branching purists endorse a realist conception of branching according to which there is a plurality of overlapping worlds that are equal in all respects, so they tend to define the thin red line as an unwelcome variant of that conception.<sup>9</sup>

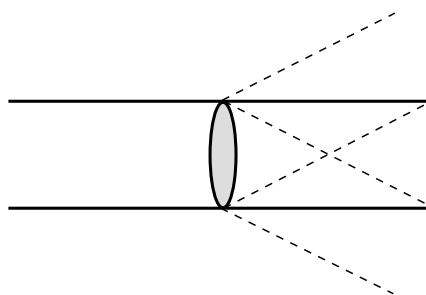


Figure 8: The thin red line with ersatz branching

An alternative way to phrase the thin red line is to treat non-actual futures as less real than the actual future, as in figure 8. Non-actual futures can be conceived as ersatz futures rather than as concrete entities that exist in the same way as the actual future. Of course, in this case there is no real branching, assuming that ersatz branching does not count as “real”, and linearity holds at the ontological level. But this is not necessarily a problem. Whether it is a problem depends on how important is real branching, and it is not obvious that the Ockhamist should agree with branching purists on the importance of branching.

Independently of how non-actual futures are understood, determinate truth and determinate falsity can be defined in accordance with Ockhamism. Let  $p$  be a sentence about the future. Then  $p$  is determinately true if and only if it is true in all possible futures, and  $p$  is determinately false if and only if it is false in all possible futures. So it turns out that future contingents are neither determinately true nor determinately false.

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<sup>9</sup>This is the version that we find in Belnap and Green [1], Belnap, Perloff and Xu [18], and in MacFarlane [13].

Now let us consider divergence. According to this view, we belong to a single history, the actual history, although there are other histories that are qualitatively identical up to now but have a different future. The key difference between divergence and the thin red line — assuming the received version of the latter — concerns the possibility of overlap. To endorse the thin red line is to think that two histories can overlap, that is, that they can have some part in common. To endorse divergence, instead, is to conceive histories as entirely disconnected totalities.

Figure 9 illustrates divergence. Imagine that the salami below is the actual history, and that the left portion of the salami above — the portion that precedes the slice — is qualitatively identical to the left portion of the salami below, but that the right portion of the salami above — the portion that follows the slice — differs from the right portion of the salami below. The two salami are divergent histories. As in the case of the thin red line, time is linear in the sense that the actual history, just as any history, is a linearly ordered set of moments.

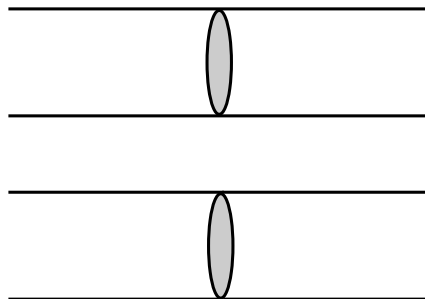


Figure 9: Divergence

Divergence has been spelled out and defended by Lewis within his conception of possible worlds. According to that conception, possible worlds are as real as the actual world, and actuality is indexical, that is, the actual world is nothing but our world. Therefore, to say that the salami below is the actual history is to say that we are in that salami. In the other salami there are other individuals who are counterparts of us. Just as we have a future, the right portion of the salami below, our counterparts have their own future, the right portion of the salami

above.<sup>10</sup>

It is important to note, however, that in order to endorse divergence it is not necessary to buy the whole of Lewis's conception. Nothing prevents an Ockhamist from thinking that actuality is not indexical and that non-actual histories are less real than the actual history. In figure 10, the salami above is represented as an ersatz history. As in the case of the thin red line, the ersatz version of divergence entails linearity at the ontological level. As a matter of fact, it is not even clear whether there is any substantive difference between ersatz divergence and ersatz branching.<sup>11</sup>

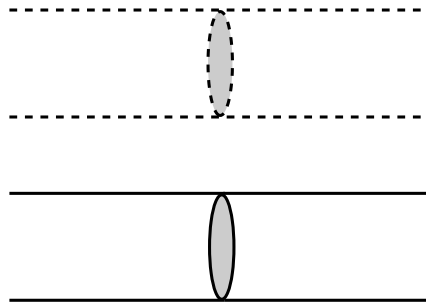


Figure 10: Ersatz divergence

Independently of how non-actual histories are understood, determinate truth and determinate falsity can be defined in accordance with Ockhamism. If one assumes divergence, one can say that a sentence is determinately true if and only if it is true in all possible futures, and determinately false if and only if it is false in all possible futures. So it turns out that future contingents are neither determinately true nor determinately false.

Let us close this first part of the paper with two general remarks. One is about the irrelevance of ontology. What has been said so far suggests that the tenability of Ockhamism does not essentially depend on the question whether the future exists, at least if 'exists' is read in

<sup>10</sup>Lewis [12], p. 206.

<sup>11</sup>At least as far as the future is concerned. In the case of the past, it might be argued that ersatz divergence, unlike ersatz branching, implies that no individual can inhabit two distinct past portions of histories.

some substantive sense which does not apply to ersatz entities. On the one hand, as the case of presentism and the growing block theory shows, the existence of the future is not necessary for Ockhamism. On the other hand, even if a unique actual future exists, it is not in virtue of its mere existence that Ockhamism holds, because other possible futures can exist as well. What Ockhamism requires is that the future is *determinate*, in the sense that every question about the future that one may ask has a definite answer. Existence and determinateness are not the same thing.<sup>12</sup>

The other remark concerns ersatz futures. As is well known, ersatzism is widely discussed in modal metaphysics, and some philosophers regard it as unsatisfactory. The main problem that has been raised in connection with ersatzism is that its explanatory power is constrained by the expressive resources of the language in terms of which it is defined. This gives rise, among other things, to obvious issues of cardinality, because there seem to be more possible states of affairs than those describable in any language. However, it is important to understand that the explanatory limits of ersatzism do not affect its suitability for our purpose. Since Ockhamism is a theory about the semantic properties of certain sentences, future contingents, all that is needed from an ersatz future is that it makes true or false those sentences. So no problem can arise if the ersatz future itself is defined in terms of the same language to which those sentence belong.

## 5 Three ways to understand the openness of the future

The claim that the future is open occurs quite often in the debate on future contingents. Many philosophers tend to think that, at least on some plausible interpretation, this claim is an intuitive hypothesis that yields substantive consequences. Here ‘intuitive’ means ‘pretheoretically plausible’: an intuitive claim about the future is a claim that seems true to those who are not familiar with the subtleties of the disquisitions on future contingents and do not endorse a definite view of future contingents. Instead, ‘yields substantive consequences’ means ‘makes a difference to the issue of future contingents’: a claim about the future has substantive consequences if it supports a definite view or a definite set of views of future contingents, while it rules out other views. The remaining part of this paper is intended to show that there is no such interpretation: either

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<sup>12</sup>This is essentially the distinction drawn in Torre [23], pp. 361-363.

the claim that the future is open yields no substantive consequence, or it is not intuitive. In both cases, it cannot be used against Ockhamism.

There are at least three plausible ways to understand the openness of the future. The first is to define it in terms of existence of alternative possibilities: to say that the future is open is to say that, for some sentence about the future ' $p$ ', it is possible that  $p$  and it is possible that not- $p$ . This interpretation is simple and straightforward because it equates the claim that the future is open with the negation of fatalism, the doctrine that no future event is contingent. Note also that, on the assumption that ' $p$ ' is neither determinately true nor determinately false when it is possible both that  $p$  and that not- $p$ , this amounts to saying that some sentence about the future are neither determinately true nor determinately false.

If the openness of the future is understood in terms of existence of alternative possibilities, then it is consistent with each of the views outlined in sections 2-4. If one endorses presentism or the growing block theory, one can say that, although there is presently nothing ahead of us, it is possible that what will exist is such that  $p$  and it is possible that what will exist is such that not- $p$ . If one grants the actual future and endorses the thin red line, one can say that there are possible futures in which  $p$  and possible futures in which not- $p$ . The same goes for divergence, even though in that case the possible futures have distinct pasts and distinct presents. More generally, this interpretation of the claim that the future is open is consistent with almost any metaphysical views in the debate on future contingents, given that almost everybody rejects fatalism.

The second way to understand the openness of the future is to define it in terms of *indetermination*, understood as absence of determination: to say that the future is open is to say that nothing determines the future. Determination may be defined as a relation between states: given a state  $S$  that obtains at time  $t_0$  and given a state  $S'$  that obtains at time  $t_1$ ,  $S$  determines  $S'$  if and only if the obtaining of  $S$  at  $t_0$ , together with the laws of nature, entails that  $S'$  obtains at  $t_1$ . Determinism is the thesis that, for every time, the state that obtains at that time is determined by the states that obtain at previous times. Indeterminism is the negation of that claim.

None of the views outlined in sections 2-4 entails determinism. Consider presentism and the growing block theory. Suppose that  $t_0$  is the



present time and that  $S$  is the state of the universe at  $t_0$ . Then, given a time  $t_1$  later than  $t_0$ , nothing exists in  $t_1$ , even though when we will be in  $t_1$ , another state  $S'$  will obtain. Each of the two views says nothing about the relation between  $S$  and  $S'$ , so it is consistent with the hypothesis that  $S$  does not determine  $S'$ .

Now consider the thin red line. In this case it is important to bear in mind the distinction between moments, the minimal constituents of histories, and times, understood as absolute temporal units. For example, if there are three possible futures, as in figure 7, each of which includes a different tomorrow, the three tomorrows are simultaneous moments, that is, moments that occur at the same time. The thin red line is consistent with indeterminism precisely because different moments — moments that belong to different histories equally compatible with the laws of nature — can occur at the same time. Suppose that  $m_0$ , the present moment, occurs at  $t_0$ , and that  $m_1$  and  $m_2$  are future moments that occur at  $t_1$ . If  $S$  obtains at  $m_0$ , while  $S'$  and  $S''$  obtain respectively at  $m_1$  and  $m_2$ , then  $S$  determines neither  $S'$  or  $S''$ , for it is compatible both with  $S'$  and with  $S''$ .

Finally, consider divergence. In this case, again, indeterminism is tenable because different moments — moments that belong to different histories equally compatible with the laws of nature — can occur at the same time. The only difference is that here there is no unique present moment, as in figure 9. Suppose that  $m_0$  and  $m_1$  are qualitatively identical moments that belong to  $t_0$ , and that  $m_2$  and  $m_3$  are different moments that belong to  $t_1$ . If  $S$  obtains at  $m_0$  and  $m_1$ , while  $S'$  and  $S''$  obtain respectively at  $m_2$  and  $m_3$ , then  $S$  determines neither  $S'$  or  $S''$ , for it is compatible both with  $S'$  and with  $S''$ .

More generally, this interpretation of the claim that the future is open is consistent with almost any metaphysical view in the debate on future contingents, because most theorists of future contingents reject determinism. Determinism entails fatalism: if everything is determined, then no future event is contingent. Therefore, if fatalism is false, the same goes for determinism.<sup>13</sup>

The third way to understand the openness of the future is to define

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<sup>13</sup>Note that, as explained in Iacona [8], p. 43, and Correia and Rosenkranz [3], pp. 116-121, indetermination must not be confused with indeterminateness, understood as absence of a determinate future in the sense considered in section 4. There can be indetermination without indeterminateness, because the future can be determinate without being determined.

it in terms of causal power: to say that the future is open is to say that we can *affect* the future, in that our present actions have future effects. For example, if we set the alarm of our phone at 7 am, the sound that the phone will emit tomorrow morning is an effect of the movements that we perform tonight. Clearly, the past does not depend on us in this sense, because our present actions do not have past effects. No matter whether we set the alarm or not, what happened yesterday remains the same.<sup>14</sup>

The idea that we can affect the future is clearly consistent with the views outlined in sections 2-4. In each of the three cases, it makes perfect sense to say that an event which occurs at a given time causes another event that occurs at a later time. More generally, this interpretation of the claim that the future is open is consistent with most metaphysical views, for theorists of future contingents mostly take causal power for granted.

To summarize, there are three plausible interpretations of the claim that the future is open: the first is that, for some sentence about the future ' $p$ ', it is possible that  $p$  and it is possible that not- $p$ , the second is that there is indetermination, the third is that we can affect the future. Each of these interpretations is consistent with the views outlined in sections 2-4. This means that the claim that the future is open, on the three interpretations considered, yields no substantive consequence, as it does not divide the space of the possible solutions to the problem of future contingents.

## 6 Other definitions

The three interpretations considered are not the only admissible interpretations. The metaphor of openness may be construed in many ways, so it is legitimate to expect that there are other interpretations on which the claim that the future is open does yield substantive consequences. The problem with such interpretations, however, is that they are definitely less plausible than those considered.

Here is an example. Some philosophers equate the openness of the future with the failure of bivalence: to say that the future is open is to say that future contingents are neither true nor false. On this in-

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<sup>14</sup>This asymmetry can be described in terms of counterfactual dependence, as suggested in Lewis [11].

terpretation, the claim that the future is open yields substantive consequences. However, it is a controversial question whether the future is open in the sense defined. Merely stipulating that openness amounts to non-bivalence does not provide any reason to think that the stipulation captures some pretheoretical intuition.<sup>15</sup>

Here is another example. Some philosophers equate the openness of the future with branching: to say that the future is open is to say that time branches into a plurality of possible futures that are equal in all respects. On this interpretation, again, the claim that the future is open yields substantive consequences. However, it is a controversial question whether the future is open in the sense defined.<sup>16</sup>

The latter question emerges clearly in the dialectic between branching and divergence. According to branching purists, divergence does not preserve the openness of the future. Suppose that Leo wonders whether he can become an established jazz pianist. As far as divergence is concerned, the answer is affirmative if Leo will sell vacuum cleaners for the rest of his life but there is a history in which a quite similar individual, Leo\*, will become an established jazz pianist. However - branching purists may contend — what Leo wonders — is whether *he*, Leo, can become an established jazz pianist, not whether another person has that opportunity. How can Leo's future be open if it only includes the sale of vacuum cleaners?<sup>17</sup>

To this objection it might be replied that divergence does not deny that one and the same individual has alternative possibilities. Let it be granted that 'Leo can become an established jazz pianist' is true. Insofar as divergence explains the truth of this sentence in terms of the existence of a history in which Leo\* becomes an established jazz pianist, the individual to whom is correct to attribute the modal property of possibly becoming an established jazz pianist is Leo, not Leo\*. Certainly, this explanation cannot be taken as a description of what Leo has in mind when he wonders whether he can become an established jazz pianist. But the same hold for any alternative explanation of the same fact. Just as

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<sup>15</sup>Markosian [16], p. 96, defines openness along these lines. This definition is questioned in Barnes and Cameron [7], p. 293, Torre [23], and Besson and Hattiangadi [6], pp. 254-255.

<sup>16</sup>A definition along these lines is adopted in MacFarlane [13] and in Spolaore and Gallina [22].

<sup>17</sup>MacFarlane [13], p. 326, MacFarlane [14], pp. 81-82, Diekemper [4], p. 443, express misgivings of this kind.

Leo does not think about Leo\*, he does not think that he inhabits two histories that share a common segment and branch towards the future.<sup>18</sup>

It is difficult to judge who is right. The objection against divergence stems from a line of thought that goes back to Kripke and is antithetical to the theory of counterparts defended by Lewis. According to this line of thought, the truth or falsity of a sentence that attributes a modal property to an individual depends on what happens to the same individual in possible worlds other than the actual world. The question of which of these two positions is preferable cannot be settled simply by appealing to intuitions.<sup>19</sup>

The point about the two examples considered may be generalized. For any interpretation of the claim that the future is open which equates the openness of the future with a specific logical or metaphysical option in the debate on future contingents, it is trivially correct to say that the claim that the future is open yields significant consequences, given that it rules out other logical or metaphysical options. However, for any such interpretation, it is a controversial question whether the future is open in the sense defined, so the claim that the future is open is not intuitive.

All things considered, there seems to be no interesting reading of the claim that the future is open. On the one hand, there are interpretations, such as those outlined in section 5, on which the claim is intuitive but does not yield substantive consequences. On the other hand, there are interpretations, such as those outlined in this section, on which the claim yields significant consequences but is not intuitive. So it seems that there is no coherent sense in which the claim enjoys both properties. This suggests that, as far as the discussion of Ockhamism is concerned, the metaphor of openness is nothing but an empty rhetorical device.

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<sup>18</sup>As Torre [23] observes, pp. 367-368, few philosophers would agree that something is a genuine possibility for a person only if it belongs to a possible future in which the person literally exists.

<sup>19</sup>Kripke [10]. Divers [5], pp. 122-148, discusses the main objections to counterpart theory.

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