

The Growing Block, the Open Future, and Future Truths

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For a book symposium in *Disputatio* on Fabrice Correia and Sven Rosenkranz's *Nothing to Come*

1 Introduction

Nothing to Come provides a sophisticated, compelling, and thoroughly defended account of the growing block theory. One of the traditional motivations for the growing block theory has been its ability to accommodate the asymmetry in openness between the past and the future. Typically, we think that the past is fixed and settled, whereas the future is open and unsettled. There is no use in crying over spilled milk, what's done is done. The future, on the other hand, holds many, yet-to-be realized possibilities; it's ours to shape. This asymmetry in openness is built into the ontology of the growing block: past events are ensconced in the block, but future events have yet to be. But even though we may regard the future as open, there still seem to be truths about the future. We believe that it is true that the sun will rise tomorrow, we believe that it is true that Covid-19 will not be eradicated by next week, and we believe that it is true that our planet will get warmer. And so, a tension arises for the traditional growing block theorist. The openness of the future is accommodated by the absence of future ontology, yet if we countenance truths about the future, as I think we should, there is no future ontology to make such claims true. To put it succinctly: how can there be future truths if there is no future? It is this question, and related ones, that Fabrice Correia and Sven Rosenkranz (henceforth 'C&R') address in chapter 7 of their book, and in this note I evaluate the extent to which their responses are successful.

2 Grounding Future Contingent Truths

Let us consider an example of a future contingent statement to use throughout:

(D) This sodium-24 atom will decay in the next 24 hours.¹

¹Sodium-24 is a radioactive isotope of sodium that has a 15-hour half-life. Suppose that

C&R uphold bivalence for future contingents. Future contingents like (D) are either true or false (and not both). C&R are correct to emphasize the point that bivalence for future contingents is compatible with a growing block metaphysics. For the sake of this discussion, let us suppose that (D) is true. If we maintain that (D) is true, and maintain, along with the growing block theorist, that future objects and events do not exist, a question arises as to what makes (D) true. An attractive and popular commitment among metaphysicians is that truths do not float free. There is something in the world that grounds their truth or makes them true. Although there are different ways of capturing this commitment, a Truthmaker Principle may be stated as follows:

- For every (positive) true proposition, p , there exists something that makes p true.

An alternative to the growing block theory is the block theory according to which all objects and events, past, present and future, exist in a block of spacetime: the future exists to the same degree as the past and present, and the total sum of reality does not increase from one moment to the next as it does on the growing block theory. The block theorist can maintain that (D) is true and that it is made true by the existence of a future event: namely the event of the sodium-24 atom decaying tomorrow. So the truth of (D) is straightforwardly compatible with the Truthmaker Principle. But for the growing block theorist, there are no future objects or events that make (D) true, and so there is a *prima facie* problem with endorsing the Truthmaker Principle in the case of future truths.

C&R claim to offer a substantive grounding/truth-making principle that explains why (D) is true and is compatible with their growing block metaphysics. They state the grounding principle for future contingents that they endorse as follows:

(GR) For all ψ , Sometimes, $\exists X((\text{Now}, \psi \text{ is true}) \text{ because } X \text{ exist})$

' ψ ' here ranges over future contingent truths such as (D), ' $\exists X$ ' denotes a plural existential quantifier. And 'Sometimes' is a tense operator that is defined by C&R (p.6) as (where ' φ ' denotes a proposition, 'P' abbreviates 'sometimes in the past' and 'F' abbreviates 'sometimes in the future'):

- Sometimes, $\varphi \equiv_{\text{df}} (P\varphi \vee \varphi \vee F\varphi)$

Applying (GR) to (D), we can derive the following grounding claim for the truth of (D):

(GD) Sometimes, there exist things such that now, (D) is true because these things exist.

the demonstrative phrase 'this sodium-24 atom' in (D) succeeds in picking out a specific atom of sodium-24 and that whether the atom will decay in the next 24 hours is an indeterministic matter.

Unlike the Lucretian presentist, C&R do not believe that the things in virtue of which (D) is true presently exist; rather they maintain that the things in virtue of which future truths are true *will* exist.² So (GD) entails:

(FGD) It will be the case that there exist things such that now, (D) is true because those things exist.

But it is worth noting that (FGD) is itself a future contingent. It claims that it will be the case that some things exist that make (D) true. But what makes (FGD) true? Here it seems we are led on a regress. The regress becomes apparent if we apply (GR) to (FGD) to derive:

(FGGD) It will be the case that there exist things such that now, (FGD) is true because those things exist.

Again, (FGGD) is a future contingent and so we can ask what makes it true. Applying (GR) to it results in another future contingent, and off we go.

Note that the corresponding problem does not arise for one who includes future grounds or truthmakers in her ontology. For the block theorist, (D) is true in virtue of the fact that the event of the sodium-24 atom's decay exists (where 'exists' here is understood in a tenseless, unrestricted sense, rather than as equivalent to 'is present', see Emery, Markosian, and Sullivan (2020, Sect. 6) for this important distinction). Since the truthmaker or grounds of the future contingent proposition is an existent event, rather than a future-tensed proposition, no regress ensues.

The explanatory impotence of (GR) can be further illustrated by considering contingent claims about the existence of future objects. When a sodium-24 atom decays, an electron is emitted leaving a magnesium-24 atom. Let us continue to suppose that (D) is true and let us call the magnesium-24 atom that will be formed by the decay 'Maggie'. Consider the following future contingent:

(M) Maggie will exist in the next 24 hours.

This future contingent, like (D), is true. But why is it true? On C&R's account, its truth is supposed to be explained by applying (GR) to (M) to derive:

(FGM) It will be the case that there exist things such that now, (M) is true because those things exist.

But note that (FGM) seems no more informative or explanatory than the original claim that (M) is true. It tells us that the proposition that Maggie will exist

²The Lucretian presentist maintains that past truths are made true by presently existing properties. For example, the truth that dinosaurs existed is made true by the present having the property of *once containing dinosaurs*. An analogous move could be made with respect to truths about the future: that the sun will rise tomorrow is made true by the present containing the property of *being such that the sun will rise tomorrow*. The *locus classicus* for Lucretian presentism is (Bigelow 1995) and a more recent defense is given in Tallant and Ingram (2020). Ted Sider (2001) calls such attempts at satisfying truthmaker principles 'cheating' and C&R (p.101) seem to agree that grounding future truths in present properties would amount to cheating when it comes to satisfying the truthmaker requirement.

is true because it will be the case that there exist things such that (M) is true because those things exist. But presumably the things that will exist that make (M) now true are Maggie itself or perhaps its parts. But then the claim (FGM) is tantamount to the unhelpful claim that (M) is true because it will be the case that Maggie exists, which C&R grant is “likely to leave objectors with the feeling of having been short-changed” (p.106). I conclude that no explanatory mileage is gained by introducing (GR) and the substantial problem of explaining why future truths are true remains for C&R’s version of the growing block theory.³

3 The Open Future, Indeterminacy and Determinacy

C&R go on to argue that their commitment to bivalence for future contingents nonetheless allows them to maintain an asymmetry in openness between the past and the future. In fact, they claim that there is a construal of the open future available to the growing block theorist that is “stronger” than those available to the block theorist (p.99). C&R note that the growing block theorist’s commitment to future contingents having determinate truth-values means that the open future is not to be characterized in terms of future contingents failing to have determinate truth-values, as some have characterized it. Instead they suggest that proponents of GBT “might construe the open future just as the phenomenon that certain statements about the future are neither predetermined to be true nor predetermined to be false” (p.112) where “predetermined” here is understood in the sense of causal determinism.

But, as I have claimed elsewhere (Torre 2011), the determinism / indeterminism distinction does a poor job capturing the asymmetry in openness that we attribute to the past and future. There are two reasons for not characterizing openness in terms of indeterminism that together I take to be conclusive. First, our open future intuition seems resilient in the face of discovering that our world is deterministic or indeterministic. Suppose that it turns out that our world is indeed indeterministic and my spilling of milk this morning was an undetermined event: it is not entailed by the complete state of the world at another time and the laws of nature.⁴ It still seems that there is no use in crying over it; there’s nothing I can do about it, what’s done is done. The event is settled and fixed in a way in which future milk spillings are not. Similarly, suppose that it turns out that our world is deterministic. We would nonetheless attribute an asymmetry in openness to the past and future, and a persuasive case could be made that we would be correct in doing so (at the very least, more argumentation would be needed to establish that a determined future is a closed future). The future would still counterfactually depend on the present in a way

³See Torrenco (2014) which raises similar concerns as those raised here, about the presentist’s attempt to explain truths about the past in terms of past-tensed explanatory principles.

⁴Here and in what follows I adopt the standard assumption that the laws of nature are time-symmetrical. Thanks to an anonymous referee for pointing this out.

in which the past does not.⁵ It would still be true that were I to commit now to drinking less, my future health would improve while my past health would not. And this seems to capture an important sense in which a determined future is an open future.

The second, related reason why the asymmetry in openness is not to be characterized in terms of the indeterminism / determinism distinction is because causal indeterminacy and determinacy are properties that are symmetric with respect to the past and future: if our world is deterministic, both the past and the future are deterministic. If our world is indeterministic, then presumably both the past and the future are indeterministic.⁶ If an undetermined event is defined as one that is not entailed by the complete state of the world at a time and the laws of nature, and our world is indeterministic, then the past contains a multitude of undetermined events. Past sodium-24 decays are undetermined, just like future ones. Similarly, if it turns out that isotope decay is governed by an underlying deterministic process, then future and past decays are likewise deterministic. To the extent that the aim is to explain an *asymmetry* in openness between the past and the future, one ought to look elsewhere than causal determinism and indeterminism.

4 A New Kind of Openness?

Let us turn now to the stronger sense of openness that C&R claim is available to the growing block theorist, but not to the block theorist, thereby giving the growing block theorist an advantage when it comes to accommodating the open future. Let us take ‘ ω ’ to denote a complete description of everything that Exists at t , where we stipulate that ‘Exists’ is understood here in an unrestricted sense. For the block theorist, what Exists at $t1$ is the same as what Exists at a later time $t2$: the total sum of past, present, and future objects and events. For the growing block theorist, what Exists at $t1$ is less than what Exists at a later time $t2$: at $t1$, what Exists includes all past and present objects and events, and what Exists at $t2$ includes everything that Existed at $t1$, plus all the objects and events that have come into being since $t1$. C&R define a sense of openness that can be accommodated by the growing block theorist, but not the block theorist as follows:

- (O) Now, ω but neither a future time t nor any time later than t ever Exists.⁷

So, to provide an example, let us take t to be 2050. For the block theorist ‘Now ω ’ includes in its description everything that exists unrestrictedly and so,

⁵In his (1979) David Lewis assumes “strict determinism” in arguing that the asymmetry in openness between past and future is due to an asymmetry in counterfactual dependence on the present.

⁶Again I assume here that the laws are time-symmetrical.

⁷This is a simplified version of statement (III’) on p.116, but I don’t think anything I say here depends on simplifying it in this way.

assuming that the actual world lasts well beyond 2050, ‘Now ω ’ includes 2050 and all times later than it. For the growing block theorist, ‘Now ω ’ does not include 2050 or any times later than it. It only includes 2021 and all times earlier than it. So, for the block theorist, it cannot be that there is what is described by ‘Now ω ’ and no 2050 or times later since 2050 and later times are included in the description. Whereas for the growing block theorist, there can be what is described by ‘Now ω ’ and no 2050 or times later than 2050 since these times are not part of the description. So, C&R conclude, there is a sense of openness captured by (O) that is available to the growing block theorist, but not the block theorist.

But this is indeed a very strange sort of openness. Note that the block theorist can grant the claim that the world *may end by 2050* even if it does not in fact end by 2050. If the block theorist were unable to accommodate this possibility, then I would agree that this would be a strike against the block theorist. But of course this modal intuition is easily accommodated. The claim that the world may end by 2050 is made true by a world that is a perfect match of the actual world up to 2050 and then ceases to exist, containing neither 2050 nor any later times. So to the extent that we want to countenance the intuition that it is possible that there may be no times after 2050, it seems that the block theorist can straightforwardly accommodate this. What C&R deny is that the block theorist can accommodate the claim that what exists unrestrictedly now is such that it fails to include 2050 or any later times. But why think that our intuitions about the openness of the future employ this unrestricted sense of ‘exists’? In fact, if the block theory is true, then this unrestricted sense of ‘exists’ likely plays no role in accommodating the open future intuition and to insist that it does is to beg the question against the block theorist. The block theorist will deny that when one speculates about time ending in 2050, one understands this in terms of the total sum of what unrestrictedly exists failing to contain 2050 or later times.

5 Conclusion

We began by considering the question: how can there be truths about the future if there is no future? C&R take this question seriously and attempt to provide a grounding principle for future truths in terms of (GR). However, I have argued that this grounding principle makes no progress in explaining why truths about the future are true. And so I conclude that the problem of explaining why truths about the future are true remains for C&R’s version of the growing block theory.

I then considered the way in which C&R attempt to accommodate the openness of the future within their growing block framework, arguing that the asymmetry in openness between past and future is not plausibly analyzed in terms of causal determinism or indeterminism. I also considered a sense of openness that C&R claim is available to the growing block theorist but not the block theorist. I claimed that this sense of openness is likely not the sort that we have in mind

when we attribute an asymmetry in openness to the past and future, and to the extent that we think it is possible for a future time to be the last, this intuition can be perfectly well accommodated within the block framework.

Even though I do not think it is true, I can see the attraction of what one might term 'Aristotelian openness' which denies bivalence for future contingents and maintains that future contingents like (D) are neither true nor false.⁸ This strikes me as a genuine way in which the future may be open: open with respect to the truth-value of future contingents. And combining Aristotelian openness with a growing block metaphysics allows one to maintain a robust and substantive truthmaker principle: past and present truths are made true by objects and events contained in the growing block, whereas future contingents fail to be true because there is no future yet to make them true. But for growing block theorists, like C&R, who deny future ontology, yet embrace contingent truths about the future, the question of what grounds such truths remains unanswered.⁹

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⁸Examples of theorists who characterize the openness of the future in this way include Markosian (1995) and Williams (Unpublished).

⁹Thank you to two anonymous referees for helpful comments on an earlier draft.