

BOOK REVIEW¹

The Nature of Contingency: Quantum Physics as Modal Realism. By Alastair Wilson. (Oxford: OUP, 2020. Pp. 219. Price £50.00.)

In *The Nature of Contingency*, Alastair Wilson defends *quantum modal realism* (QMR), an account of modality in terms of the many worlds of *Everettian quantum mechanics* (EQM).

The central principles of QMR are

Alignment: To be a metaphysically possible world is to be an Everett world.

Indexicality-of-Actuality: Each Everett world is actual according to its own inhabitants, and only according to its own inhabitants. (p. 22).

Where an Everett world “is a global quantum-mechanical sequence of events, and the key theoretical device of modern EQM” and “there is an Everett world for every quantum-mechanically possible sequence of events” (p. 23).

Why take individual Everett worlds to be metaphysically possible worlds rather than taking the whole Everettian pluriverse to be one metaphysically possible world among others? This is tantamount to asking why we should adopt QMR; Wilson thinks we should adopt QMR on the basis of its theoretical virtues. The arguments of chapter 1, according to which QMR enjoys at least those theoretical virtues enjoyed by Lewisian Modal Realism (LMR) (Lewis 1986) are thus particularly important.

Consider *Modality* first. The basic idea here is captured in *Alignment* and *Indexicality-of-Actuality*, but Wilson elaborates as follows: “at a first pass: for an event to be metaphysically possible is for it to occur in some Everett world, for it to be metaphysically necessary is for it to occur in all Everett worlds, and for it to be actual is for it to occur in our own world.” (p. 29). QMR is thus intended as a fully reductive account of modality. Unfortunately, the modal adverbs “possibly” and “necessarily” do not receive an *official* definition in terms of Everett worlds. The reason for this becomes clear towards the end of section 1.2: QMR is susceptible to problems of *advanced modalizing* (see, e.g., Divers 1999; Jago 2016; Marshall 2016), which render familiar definitions of “possibly” in terms truth at some possible world and “necessarily” in terms of truth in all possible worlds untenable.

Next consider *counterfactuals*. QMR can retain the idea, central to Stalnaker-Lewis semantics (Stalnaker 1968; Lewis 1973), that counterfactuals are about how things stand with genuine alternative possibilities. Wilson argues that QMR can emulate Stalnaker-Lewis semantics by replacing law-violations (in the closeness ordering) with low probability thermodynamic or

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quantum quasi-miracles (pp. 43–45). Problems posed by counterpossibles carry over to QMR. Wilson opts to understand all counterpossibles as trivial because he is “motivated by a desire to maintain the guiding Stalnaker-Lewis thought [...] that counterfactual conditional assertions are [...] *about* how things stand with respect to genuine alternative possibilities.” (p. 48). QMR expands the class of trivial counterpossibles because it makes all counterfactuals with physically impossible antecedents (counterlegals) counterpossibles. Wilson doubles down here: “the triviality of counterlegals is a feature, not a bug, of quantum modal realism. Since the fundamental laws of nature are necessary according to quantum modal realism, there is nothing non-trivial to be said about genuine possibilities in which these laws fail to hold.” (p. 49).

The “Lewisian modal approach to representational content can be carried over in full generality to quantum modal realism” (p. 50); fine-grained contents can be constructed out of the coarse-grained materials of QMR (p. 51). Similarly, *properties* are understood as sets of their actual and possible instances and hyperintensional properties are understood in terms of more complex constructions out of the theoretical resources of QMR (p. 56–58).

In chapter 2, Wilson defends *diverging Everettian quantum mechanics*, according to which Everett worlds are mereologically distinct from one another. The physics is neutral between diverging and overlapping worlds, so it is up to metaphysics to arbitrate here. For example, Wilson argues that if Everett worlds overlap, properties that look monadic will turn out to be relations to Everett worlds (p. 90) (mirroring Lewis’s *argument from accidental intrinsics*), which is a reason to favour divergence. Wilson notes that motivations for overlap have two sources: intuitions about modal metaphysics and fidelity to physics, both of which he thinks can be defused (pp. 92–97).

In chapter 3, Wilson argues that by understanding the metaphysics of modality in accordance with *Alignment* and *Indexicality-of-Actuality*, EQM can be reconciled with chance because *branch weights* can play the chance role. Wilson thus responds to the concern that chance cannot be made sense of within EQM and since his argument depends on understanding *modality* in terms of Everett worlds, the account of Everettian chance provides additional support for QMR.

In Chapter 4, Wilson defends a *modalized regularity theory* of laws of nature according to which, to be a fundamental law, a regularity must hold in all possible (i.e. Everett) worlds. It follows that the fundamental laws of nature are non-contingent, but room is made for the contingency of ‘local laws’, which incorporate “parameters the value of which varies across different large-scale regions of the multiverse or of a single Everett world.” (p. 145).

In chapter 5, Wilson addresses concerns about indeterminacy in world number and nature implied by EQM: “indeterminacy of world number need not be treated as different in kind from more familiar cases of vagueness” and “worries about indeterminacy of world nature in EQM can be assuaged by adapting one of the various models of metaphysical indeterminacy that has been proposed in the recent literature.” (p. 184).

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And in chapter 6, Wilson suggests that EQM provides a framework from within which fine-tuning arguments for the existence of God may be undercut.

The Nature of Contingency is an important book. It elegantly precisifies the tantalising analogy between Lewisian modal realism and Everettian quantum mechanics and is an impressive showcase for *naturalistic* metaphysics. I will now, however, outline two concerns.

Conspicuously absent from the book (including from the early survey of “the current state of the metaphysics of modality” (sec. 0.2)) is any proper discussion of *dispositionalism* (the now classic citations are: Borghini and Williams 2008; Jacobs 2010; Vetter 2015). This is unfortunate because some of QMR’s key features and virtues are shared with dispositionalism. QMR collapses physical and metaphysical modality, which demystifies the latter and allows for the assimilation of modal epistemology to scientific epistemology. But dispositionalism too comes with the option to collapse physical and metaphysical modality in a principled way (see, e.g., Vetter 2015, sec. 7.8) and can reap the associated benefits. Wilson describes QMR as a *necessity-first* account of modality: its primary explanatory target is contingency and necessary facts are such that nothing grounds their necessity (p. 14). QMR thus dissolves Blackburn’s dilemma about the ‘source of necessity’ (Blackburn 1986). But something similar can be said of dispositionalism. According to, e.g., Vetter (2015), (roughly) ‘possibly P’ is true iff there is a potentiality for it to be the case that P and ‘necessarily P’ is true iff there is no potentiality for it to be the case that not-P. Necessity is the default in the absence of a potentiality for things to be otherwise. Furthermore, given dispositionalism, there are good reasons to think that something exists necessarily which grounds all possibilities/contingencies (see, e.g., Vetter 2015, sec. 6.4; Kimpton-Nye Forthcoming). This mirrors Wilson’s claim that the fundamental ontology of QMR exists necessarily and grounds contingencies (secs 0.3 & 1.2). Dispositionalism is mentioned on page 47, where it is suggested that it constitutes a response to the problem of counterpossibles, but this mischaracterizes the motivation for dispositionalism, and as far as I can tell, counterpossibles are just as problematic for dispositionalists (see, e.g., Kimpton-Nye Forthcoming for relevant discussion). Dispositionalism has more in common with QMR than Wilson lets on and given its comparable virtues, its existence may be a threat to QMR.

The fate of QMR is intimately tied up with that of LMR. QMR enjoys many of the theoretical benefits enjoyed by LMR, but on the flipside, problems for LMR carry directly over to QMR. For example, QMR, like LMR, is a *reductive* account of modality. Some might see this as a benefit, but others will see it as a flaw. For why should we believe the philosopher who tells us that all of our modal talk and thought is really about something completely non-modal? Relatedly, *advanced modalizing* problems loom large for QMR; propositions about the modal status of the pluriverse seriously threaten the modal realist’s reductive analysis of modality (see, e.g., Divers 1999; Jago 2016; Marshall 2016). Wilson expresses confidence that some extant response to the advanced modalizing problems will suffice. However, the most recent work in this area (notably Jago 2016; Marshall 2016) is far more pessimistic about modal realism’s prospects. The impression one gets is that modal realism (be it quantum or Lewisian) far from being a philosopher’s paradise, may not even be able to do the most basic work for which it was originally invoked: that of providing a fully *reductive* account of modality. The presence

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of dispositionalism – an attractively naturalistic *non*-reductive account of modality – appears even more threatening to QMR in light of the problems of advanced modalizing.

References

- Blackburn, Simon. 1986. 'Morals and Modals'. In *Fact, Science and Morality*. Oxford: Blackwell.
- Borghini, Andrea, and Neil E Williams. 2008. 'A Dispositional Theory of Possibility'. *Dialectica* 62 (1): 21–41. <https://doi.org/10.1111/j.1746-8361.2007.01130.x>.
- Divers, John. 1999. 'A Genuine Realist Theory of Advanced Modalizing'. *Mind* 108 (430): 217–239. <https://doi.org/10.1093/mind/108.430.217>.
- Jacobs, Jonathan D. 2010. 'A Powers Theory of Modality: Or, How I Learned to Stop Worrying and Reject Possible Worlds'. *Philosophical Studies* 151 (2): 227–48. <https://doi.org/10.1007/s11098-009-9427-1>.
- Jago, Mark. 2016. 'Advanced Modalizing Problems'. *Mind* 125 (499): 627–42. <https://doi.org/10.1093/mind/fzv172>.
- Kimpton-Nye, Samuel. Forthcoming. 'Can Hardcore Actualism Validate S5?' *Philosophy and Phenomenological Research* na (na). <https://doi.org/10.1111/phpr.12656>.
- Kimpton-Nye, Samuel. Forthcoming. 'Necessary Laws and the Problem of Counterlegals'. *Philosophy of Science*. <https://doi.org/10.1086/708710>.
- Lewis, David. 1986. *On the Plurality of Worlds*. Oxford, UK ; New York, NY, USA: B. Blackwell.
- Lewis, David. 1973. *Counterfactuals*. Blackwell.
- Marshall, Daniel Graham. 2016. 'A Puzzle for Modal Realism'. *Philosophers' Imprint* 16.
- Stalnaker, Robert C. 1968. 'A Theory of Conditionals'. *American Philosophical Quarterly*, 98–112.
- Vetter, Barbara. 2015. *Potentiality: From Dispositions to Modality*. First edition. Oxford Philosophical Monographs. New York, NY: Oxford University Press.
- Wilson, Alastair. 2020. *The Nature of Contingency: Quantum Physics as Modal Realism*. Oxford, New York: Oxford University Press.