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# How-possible explanations of impossibilities

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## Abstract

Dray (1957) introduced the notion of a *how-possible explanation* (HPE) to handle cases where an explanation seems to answer, not a question of the form ‘*why* did event E happen?’, but a question of the form ‘*how could* have event E happen?’. Drays’ observed that in many cases when an unexpected event occurs that we try to explain, we are satisfied to know what made the event possible, independently of whether we also know what made it necessary for things to happen in that way. Since Dray’s book a lively debate has examined the status of this kind of explanation.

Verrault-Julien (2018) has proposed that what distinguishes HPEs from other types of explanations is the type of modal information that they provide; according to them, HPEs provide information to the effect that possibly, p because q (where the relevant sense of possibility is contextually fixed, which would allow us to distinguish between genuine HPEs and so-called ‘just-so’ stories).

As part of his discussion, Verrault-Julien addresses a potential objection from van Riel (2015), namely that models provide HPEs even though models can be literally impossible (for example, models can embody idealizations that would prevent them to be realized). Verrault-Julien’s response is that while models can be impossible, they can nonetheless illustrate how things could have happened (that is, that impossible models can have possible targets). Weisberg (2013) argues, however, that some models are useful even if the *targets* themselves are impossible. Verrault-Julien’s answer to this challenge is to say that even in these cases the information the models provide is relevant to possibilities. This is somewhat unsatisfactory.

Here, I want to argue that the class of HPEs Verrault-Julien characterizes is a special case of a more general type of explanation that also covers HPE-*like* explanations that target impossibilities, independently of what they might say about what is possible. The basic idea is roughly as follows. Suppose there is, besides the stock of possible worlds, a stock of impossible worlds (cf. Berto & Jago 2019, Tanaka & Sandgren 2024). In principle (with some caveats), it is not ruled out that explanatory questions arise in or about impossible worlds, similarly to how explanatory questions arise in and about possible worlds. So, if p is true in any world, the question *how-p* can arise. If these questions have answers, they will be HPE-like explanations.

Some well known issues with impossible world frameworks leave them in an awkward position with regard to why- and how-questions. If the assignment of truth values to atomic propositions in impossible worlds is arbitrary (cf. Priest 2016 and Berto et al 2018), there will not be a good sense of neither why those propositions are true at those worlds nor how

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it is that they are true. I will sketch some possible solutions to the issue and how they can be applied to the case of HPEs, as well as discuss how the approach accommodates some ideas from structural conceptions of scientific understanding.

#### References

- Berto, F. & Jago, M. (2019). *Impossible Worlds*. Oxford: Oxford University Press.
- Brainard, L. (2020). How to explain how-possibly. *Philosophers' Imprint*, 20(13), 1-23.
- Dray, W. H. (1957). *Laws and Explanation in History*. Oxford: Oxford University Press.
- Dray, W. H. (1968). On explaining how-possibly. *The Monist*, 52(3), 390-407.
- Priest, G. (2016). Thinking the impossible. *Philosophical Studies* 173(10), 2649-2662.
- Tan, P. (2022). Two epistemological challenges regarding hypothetical modeling. *Synthese*, 200(6).
- Tanaka, K. & Sandgren, A. (2024). *The Many Faces of Impossibility*. Cambridge: Cambridge University Press.
- van Riel, R. (2015). The content of model-based information. *Synthese*, 192(2), 3839-3858.
- Verreault-Julien, P. (2019). How could models possibly provide how-possibly explanations? *Studies in History and Philosophy of Science. Part A*, 73, 1-12.
- Weisberg, M. (2013). *Simulation and Similarity: Using Models to Understand the World*. Oxford: Oxford University Press.

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