

## **Can retrocausality explain entanglement?**

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Quantum entanglement is a very puzzling phenomenon. On some understandings, the explanation of the behaviour of entangled particles requires instantaneous action at a distance, in prima facie violation of special relativity. On others, entanglement is an unexplained sui generis relation among particles, resulting in a radical kind of holism. In this paper, I explore the prospect of explaining entanglement via backward-in-time causation. While it may seem like the medicine here is worse than the disease, the tenability of a retrocausal explanation of entanglement has been ably defended by Huw Price. Price shows how such an explanation can be motivated by a general account of time-symmetry in microphysics, and argues that it avoids the standard paradoxes of bilking arguments. The retrocausal explanation also sheds interesting light on the issue of holism in quantum mechanics. However, a retrocausal explanation of entanglement has to find its place within a general interpretation of quantum mechanics. There are formidable difficulties here, not least in explaining interference phenomena. Several authors have claimed that retrocausal explanations of entanglement can be extended to cover interference (e.g. Sutherland, Wharton), but I argue here that these explanation all come up short.