

Humean Supervenience in the Light of Contemporary Science

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Abstract

It is shown that Lewis' ontological doctrine of Humean supervenience incorporates at its foundation the so-called separability principle of classical physics. In view of the systematic violation of the latter within quantum mechanics, the claim that contemporary physical science may posit non-supervenient relations beyond the spatiotemporal ones is reinforced on a foundational basis concerning constraints on the state-representation of physical systems. Depending on the mode of assignment of states to physical systems — unit state vectors versus statistical density operators — we distinguish between strongly and weakly non-Humean, non-supervenient relations. It is demonstrated that in either case the relations of quantum entanglement constitute prototypical examples of irreducible physical relations that do not supervene upon a spatiotemporal arrangement of Humean qualities, weakening, thereby, the thesis of Humean supervenience. It is examined, in this respect, the status of Lewis' recombination principle, whereas his conception of lawhood is critically investigated. It is concluded that the assumption of ontological reductionism, as expressed in Lewis' Humean doctrine, cannot be regarded as a reliable code of the nature of the physical world and its contents. It is proposed instead that, due to the undeniable existence of non-supervenient relations, a metaphysic of relations of a moderate kind ought to be acknowledged as an indispensable part of our understanding of the natural world at a fundamental level.

Keywords: Humean supervenience, Quantum entanglement, Quantum holism, Recombination principle, Ontological reductionism, Laws of nature

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