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## **An ontology for physical necessity**

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## Propositions

1. The denial of the existence of necessary physical relations in David Lewis's ontology entails that the natural properties in this ontology lack distinctive content, and thus this ontology fails to account for a fundamental fact of the physical world: the categorisation of natural properties.
2. The only viable solution to the individuation regress in dispositionalism is Alexander Bird's holistic graph approach, but this approach turns out to be identical with ontological structural realism (OSR)—a stance often considered to be in tension with dispositionalism.
3. Because OSR's attempt to distinguish between mathematical and physical structure amounts to attributing quiddities to the structures of physical laws and physical systems, and given that a quiddity is inherently non-structural and lacks distinctive content, OSR's reliance on quiddities to establish the mathematical/physical distinction ultimately introduces this distinction ad hoc.
4. Anti-quidditism of relations entails that every compound relation must be constituted from some primitive relation, with the relation of coexistence (the CE relation) being the most suitable candidate. From the CE relation, a realm of complicated relational structures can be constructed, encompassing isomorphic counterparts of all mathematical structures in any mathematical reductionist programme, as well as isomorphic counterparts of all physical structures that are based on these mathematical structures.
5. There are two possible interpretations of Kit Fine's discussion of essence and modality, which are mutually exclusive: either necessity and essentiality do not align in the sense that there are instances where something is necessary without being essential, and vice versa; or the discussion of necessity should be approached on a relative basis.
6. The necessities found in mathematics and physics can be unified within the framework of metaphysical necessity.
7. Causal asymmetry and the asymmetry in metaphysical grounding can be interpreted as stemming from the same origin.
8. Material origin essentialism can be refined into a robust counterpart, physical history essentialism, positing that all past physical history of an object is essential to it, thereby remedying the potential shortcomings of the former.
9. Whereas the discipline of philosophy as a whole is commonly viewed as culturally influenced, theoretical philosophy is often considered less subject to cultural influences. In fact, however, although in more moderate ways, cultural background subtly exerts influence on theoretical philosophy too.