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# Laws, Causation and Dynamics at Different Levels

Butterfield, Jeremy (2011) *Laws, Causation and Dynamics at Different Levels*. [Preprint]



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## Abstract

I have two main aims. The first is general, and more philosophical (Section 2). The second is specific, and more closely related to physics (Sections 3 and 4). The first aim is to state my general views about laws and causation at different 'levels'. The main task is to understand how the higher levels sustain notions of law and causation that 'ride free' of reductions to the lower level or levels. I endeavour to relate my views to those of other symposiasts. The second aim is to give a framework for describing dynamics at different levels, emphasising how the various levels' dynamics can mesh or fail to mesh. This framework is essentially that of elementary dynamical systems theory. The main idea will be, for simplicity, to work with just two levels, dubbed 'micro' and 'macro' which are related by coarse-graining. I use this framework to describe, in part, the first four of Ellis' five types of top-down causation.

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Additional Information: For an issue of the journal, Interface Focus (Royal Society, London), on the theme of top-down causation

Keywords: Emergence, causation, reduction, dynamics, supervenience, coarse-graining

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