Does Biology need a new theory of explanation? An investigation into the possibility of moving past the limits of mechanistic and teleological descriptions of organisms.

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Abstract

The problem of how to explain the fundamental nature of organisms for biology commonly falls under two causal systems, mechanistic and teleological. These systems however, fall into fundamental logical problems when put to the test. Many biologists also claim that these systems miss the essential nature of organisms. Historically one of the most important discussions of this problem occurs in Immanuel Kant's *Critique of Judgment,* and this work has been chosen as the basis for an investigation of possible ways to avoid the inherent problems that occur with mechanistic and teleological explanations in current biology. By evaluating Kant's claim, that organisms are not accurately describable by our standard causal explanations, it could be assessed in light of current discoveries whether we have the ability to develop a new causal or acausal system by which to explain organisms.

From this analysis, and in agreement with Kant's investigations of the problems of 'design-like' characteristics in organisms, both causal mechanistic and teleological explanations were found to be inapplicable for use in any comprehensive and accurate understanding of organisms and evolution. They are recommended at best to be considered as heuristics. Following this, an investigation of alternate methods of explanation apparently not prone to the problems of mechanistic and teleological causal explanations were characterised and assessed. This lead to the uncovering the system of extremal principles, a system that claims to be acausal and seems to have direct application to fundamental aspects of biology and evolution.

This acausal system of extremal principles can for example, be used to describe the class of solitons. Types of solitons (biosolitons) exist in organisms and are important aspects of processes such as morphogenesis, DNA replication, self organization in the cytoskeleton, and locomotion to name a few. They also exhibit the properties of the quantum wave-particle fermions. It is proposed that further investigation of the system of extremal principles and their influence in biology through phenomena such as biosolitons can provide the basis for the development of a new acausal system of explanation or an extra aspect for standard causal models. This, it is concluded, will allow a potential avenue for creating a new and logically more consistent explanatory system in relation to fundamental aspects of the phenomenon of evolution, organisms and the environment.

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