
Emergence and Downward Determination from a Philosophical Point of View

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Abstract

Session: Emergence and Downward Determination in Biological Systems? (Shunkichi Matsumoto, Naoki Sato, Toshiyuki Nakajima)

As a philosopher I will critically examine the arguments of two biological scientists, Naoki Sato and Toshiyuki Nakajima, on emergence and downward determination respectively, in biological systems.

As for the notion of emergence, there has been rich tradition of philosophical arguments about diachronic and synchronic emergences, its relationship with reduction, epistemological emergence as unpredictability and ontological emergence as supervenience, and so on. In my talk, I will try to contextualize Sato's proposed notion of 'dynamic' emergence in this tradition and examine whether his notion really adds to the inventory of emergence. In addition, I will consider the legitimacy of his idea that it is genetic information which differentiates biologically emergent phenomena from non-biologically emergent ones, thereby making life really deserve to be so called.

The notion of downward determination, too, is what has been much debated in philosophical literature. I will explore whether Nakajima's radical proposal that Darwinian theory will remain incomplete until it fully recognizes the importance of, and incorporates into its framework, the downward determination from upper-level entities (like ecosystems) to the lower-level ones (populations, organisms, and so on) is really news for us traditional neo-Darwinists. For, we have already been much discussing such problems as the multi-level selections where the fitnesses of the lower, embedded entities depend on the structure or organization of the upper, embedding entities (Okasha 2006).

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