Philosophy of Science and Interdisciplinarity

MPIWG, 2019.12.2

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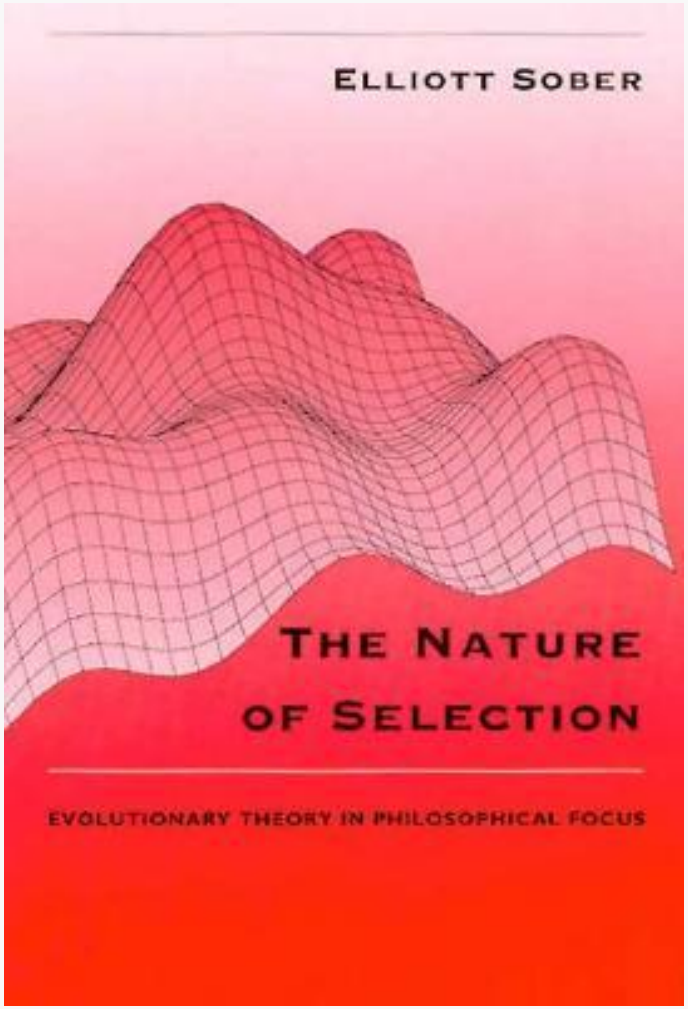
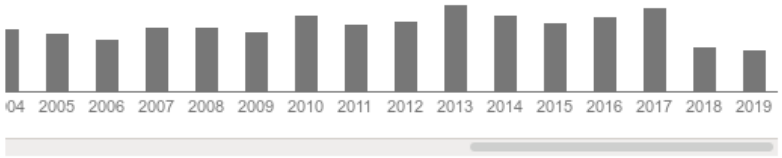
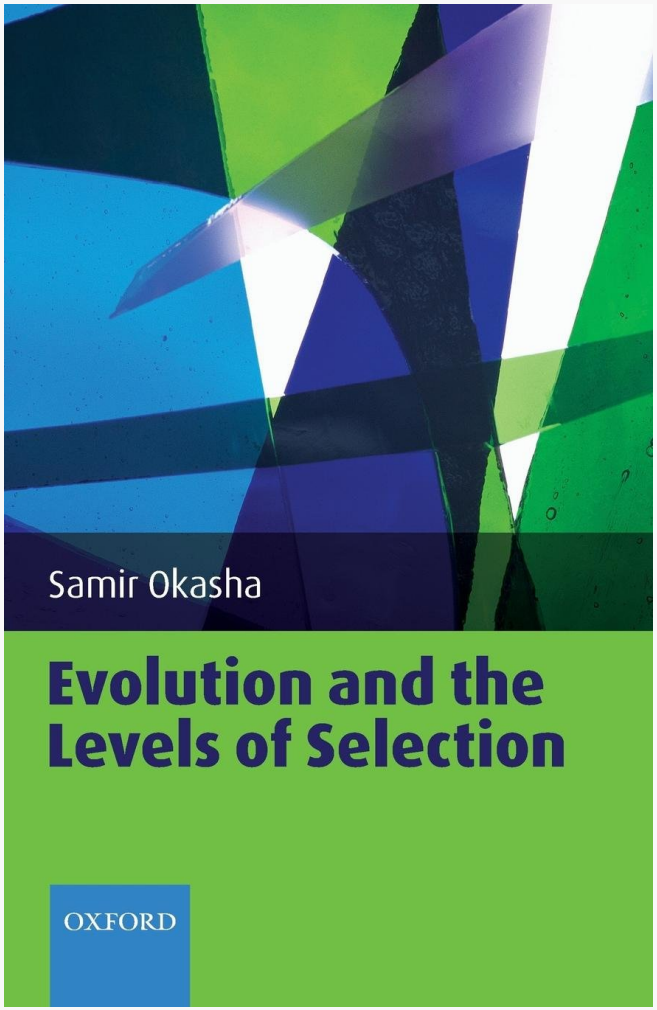
A Perception



The nature of selection: Evolutionary theory in philosophical focus

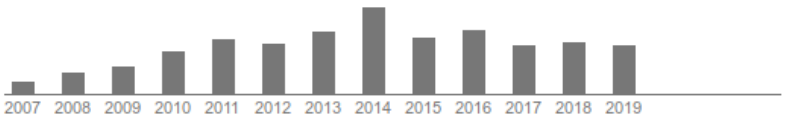
Auteurs	Elliott Sober
Date de publication	2014/12/10
Éditeur	University of Chicago Press
Description	The Nature of Selection is a straightforward, self-contained introduction to philosophical and biological problems in evolutionary theory. It presents a powerful analysis of the evolutionary concepts of natural selection, fitness, and adaptation and clarifies controversial issues concerning altruism, group selection, and the idea that organisms are survival machines built for the good of the genes that inhabit them." Sober's is the answering philosophical voice, the voice of a first-rate philosopher and a knowledgeable student of contemporary evolutionary theory. His book merits broad attention among both communities. It should also inspire others to continue the conversation."-Philip Kitcher, Nature" Elliott Sober has made extraordinarily important contributions to our understanding of biological problems in evolutionary biology and causality. The Nature of Selection is a major contribution to understanding epistemological problems in evolutionary theory. I predict that it will have a long lasting place in the literature."-Richard C. Lewontin
Nombre total de citations	Cité 2664 fois





Evolution and the levels of selection

Auteurs	Samir Okasha
Date de publication	2006/11/16
Éditeur	Oxford University Press
Description	Does natural selection act primarily on individual organisms, on groups, on genes, or on whole species? Samir Okasha provides a comprehensive analysis of the debate in evolutionary biology over the levels of selection, focusing on conceptual, philosophical and foundational questions. A systematic framework is developed for thinking about natural selection acting at multiple levels of the biological hierarchy; the framework is then used to help resolve outstanding issues. Considerable attention is paid to the concept of causality as it relates to the levels of selection, in particular the idea that natural selection at one hierarchical level can have effects that'filter'up or down to other levels. Unlike previous work in this area by philosophers of science, full account is taken of the recent biological literature on'major evolutionary transitions' and the recent resurgence of interest in multi-level selection theory among biologists. Other biological topics discussed include Price's equation, kin and group selection, the gene's eye view, evolutionary game theory, outlaws and selfish genetic elements, species and clade selection, and the evolution of individuality. Philosophical topics discussed include reductionism and holism, causation and correlation, the nature of hierarchical organization, and realism and pluralism.
Nombre total de citations	Cité 1168 fois



A Challenge

Synthese (2013) 190:1857–1864
DOI 10.1007/s11229-012-0214-8

Philosophy *of* and *as* interdisciplinarity

Michael H. G. Hoffmann · Jan C. Schmidt · Nancy J. Nersessian

On the one hand, [interdisciplinarity] can be a new subject area just as science is the subject of "philosophy of science" and biology the subject of a "philosophy of biology," and so on.

On the other hand, interdisciplinarity can be perceived as a more fundamental challenge to philosophy itself; that is, as a challenge to the self-understanding and self-conceptualization of philosophy as an academic discipline....

Philosophy “as” interdisciplinarity starts from questioning the academic status of philosophy as a discipline with its well-known specializations, methodological approaches, and interests and attempts to envision new forms of philosophical practice, institutionalization, and products whose common denominator is embedding philosophy in inter- and transdisciplinary collaboration. (Hoffmann et al. 2013, 1858)

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What Is Interdisciplinarity?

The Influence of Natural Science Theories on Contemporary Social Science

Renate Mayntz

In [reductionist extension], a discipline and its explanatory claim[s] are extended into the phenomenal domain of another discipline. This takes place, for instance, when the chemist starts to analyze and explain biological phenomena or when the biologist tries to explain social features of modern societies as a consequence of biological, Darwinian evolution. (Mayntz 1992, 28)

Joint ventures are cases of genuine interdisciplinary collaboration. […] The necessarily interdisciplinary nature of research and theorizing in these fields is justified by the obvious fact of a strong mutual dependence between phenomena belonging to the traditional domain[s] of different disciplines. […] However, interdisciplinary cooperation, although possibly of high problem-solving potential, does not necessarily stimulate the internal development of the participating disciplines in the same way and to the same extent as transfer efforts do. (Mayntz 1992, 28)

reductionist extension: problem P isn't actually a scientific problem, it's a philosophical problem

joint ventures: problem P needs to be viewed both philosophically and scientifically, but *without altering either philosophy or science*

> Theory transfer in a strict sense presupposes – and assumes – isomorphism between the empirical phenomena to be described and explained (i.e., a 1:1 relationship between the elements, properties, and relationships of interdependence in two phenomenal fields). Two substantive theories with an identical formal structure can thus be considered two different empirical applications of one underlying formal theory. (Mayntz 1992, 30)

theoretical borrowing: no model that seems to capture the kind of interdisciplinarity being targeted by philosophers of science!

problem framing and *problem perception:* the shift to problems or types of problems that are defined outside the structures of single disciplines (often societal problems) (after Schmidt 2008)

> . . . the concepts and insights of one discipline contribute to the problems and theories of another, manifested in computational neuroscience and the philosophy of cognitive science. Individuals may find their original disciplinary methods and theoretical concepts modified as a result of cooperation, fostering new conceptual categories and methodological unification. (Klein 2010, 20)

In short: some ideas that might be useful, but we need more theory about how these interactions should work!

Where To?

What has fostered successful interdisciplinary collaboration in philosophy of biology?

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A few unfulfilling answers:

There really is **no stable discipline of theoretical biology.**

Crucial early figures in philosophy of biology (David Hull, Marjorie Grene, Robert Brandon) either **hold degrees in biology** or **spend time at biology institutions** (especially Lewontin's MCZ at Harvard).

Others (Michael Ruse) are enlisted in the **debate over creationism.**

Thoughts toward some more fulfilling answers:

- Movement in philosophy of biology: wide uptake of **philosophy of science in practice**
- Movement in biology: unease about "big theory," competition for grant funding, failures of high-profile projects (HGP)

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Same scenario in physics?

Worries.

- How does **recruitment** work?
- Where does **publication** happen? Will scholars receive genuine **credit** for their effort?
- What are the future **career paths?** (Alt-ac, science communication, public outreach?)
- How do we keep interdisciplinary work from being **a career-killer?**

Questions?

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