A Fierce Debate about Our Picture of Evolution

By Ingo Brigandt

Kim Sterelny,
Dawkins vs. Gould. Survival of the Fittest.
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Richard Dawkins and Stephen Jay Gould are both dedicated Darwinians. Despite this, for the last few decades these two scientists have argued fiercely about how evolutionary history and mechanisms are to be viewed. The debate has been fought out before a general, rather than specialists, audience, addressing questions about how to understand the history of living organisms, how evolution works, and even how humans and society are to be viewed from a biological point of view. Here, Kim Sterelny reviews the issues and arguments in a manner accessible to the scientifically interested public. It is his aim to show that this clash of opinion is rooted in two different perspectives on evolution and life.

The first main part of the book describes "Dawkins' World", whilst the second focuses on Gould ("The View from Harvard"). Dawkins' main motivation is the explanation of the adaptedness and apparent design of organisms. He focuses on natural selection as the only evolutionary force that is able to account for design. Dawkins' explanatory program is combined with a theoretical view called 'gene selectionism'. This is the idea that evolution operates ultimately on genes, that they are the units of selection. Sterelny systematically presents Dawkins' ideas and arguments about selfish genes and replicators, e.g., the idea that cumulative selection needs an entity that is potentially able to live indefinitely. An important motivation for gene selection is the fact that is allows for an elegant account of some instances of (apparently) altruistically behaviour. Refinements of Dawkins' account include his extended phenotype theory, which addresses the role of replicators and organisms in development, ecology, and evolution. The whole presentation includes a discussion of difficulties and critiques of Dawkins' gene and selection centred view, which were put forward by Gould and other authors.

Unlike Dawkins, the palaeontologist Gould is not so much interested in explaining adaptive traits, but his focus is on the explanation of certain patterns in the fossil record. He and Niles Eldredge proposed a punctuated equilibrium theory, addressing the fact that that species often seem to remain basically unchanging for a long period of time and then rather suddenly transform into a new species. In addition, Gould, tries to account for mass extinction and for the macroevolutionary fact that in the Cambrian the number of distinctly different types of organisms (disparity) suddenly increased but after that no real new body plans emerged. His approach challenges conventional views relying on natural selection, because it maintains that evolution does not always proceed gradually and emphasises selection on the species level and even chance in the history of life. Gould claims that the radical changes he focuses on cannot be explained by the adaptations of individuals to their original environment.

At the end of his book, Sterelny points to a completely different issue that underlies the fundamental disagreement between Dawkins and Gould—their views on science and religion. Whereas for Dawkins science is the only source of truth and knowledge and discredits religious views, Gould maintains that science is incomplete in telling us what to think and belief, and that for instance religion (in the broadest sense) is for instance important in giving us guidelines about what to do. Sterelny finally repeats the main points of disagreement between Dawkins and Gould

and indicates his position within this debate, namely, that in the case of macroevolution Gould has important insights whereas in the case of microevolution he rather agrees with Dawkins.

Some issues are hardly explored in Sterelny's treatment and might fall beyond the scope of his short book that tries to give a popularized overview of the debate. The discussion does not adequately explain why the clash between these two scientists has been so fierce. For instance, the two main parts focusing on Dawkins and Gould, respectively, could be set more into correspondence. The reader is likely to get the idea that the disagreement stems basically from the fact that Dawkins is interested in the explanation of microevolution, whereas Gould just focuses on macroevolution as a different part of evolutionary biology. But there is obviously more to the debate. While Sterelny's presentation and discussion is very systematic, a chronological or historical account of the debate is missing that could give a better idea about its dynamic and the interplay between Dawkins and Gould. In addition, the role of other protagonists could have been mentioned to a larger extent and it would have been important to explore the relationship of the debate to social issues and the public, because ideas and perceived tenets about for instance genetic determinism and the evolutionary explanation of humans and society are relevant for understanding the heat of the debate as a whole. It also remains unclear if and how Dawkins and Gould's disagreement about science and religion impacts on their views about biology, rather than being just another—albeit fundamental—point of disagreement. Finally, even though Sterelny implicitly addresses the idea of developmental constraints, he does not explain this factor in evolution and fails to mention that it is important for current approaches to evolution and development. It does not become clear that developmental constraints are crucial for Gould's position on evolution and that even though only natural selection can generate complex adaptations, this does not mean that other factors are vital for understanding evolution and morphological change.

Independent of some unanswered questions, a virtue of "Dawkins vs. Gould. Survival of the Fittest" is the fact that Sterelny gives an interesting and nicely written overview of the debate that includes many details and reference to biological facts and the current state of art. Moreover, Sterelny presents several important and non-obvious arguments and counterarguments that are important for the debate. For instance, he points to the fact that even though Dawkins' approach is highly conceptual, the viability of his gene selectionism depends also on empirical facts about the relationship between genes, development, and the phenotype. Sterelny's own opinion and his comments are very useful to help the reader to assess the issues at stake and arguments involved and thus to get an independent opinion on these matters. In addition, the whole presentation is largely non-technical and thus highly suitable for the non-biologist interested in this debate.

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