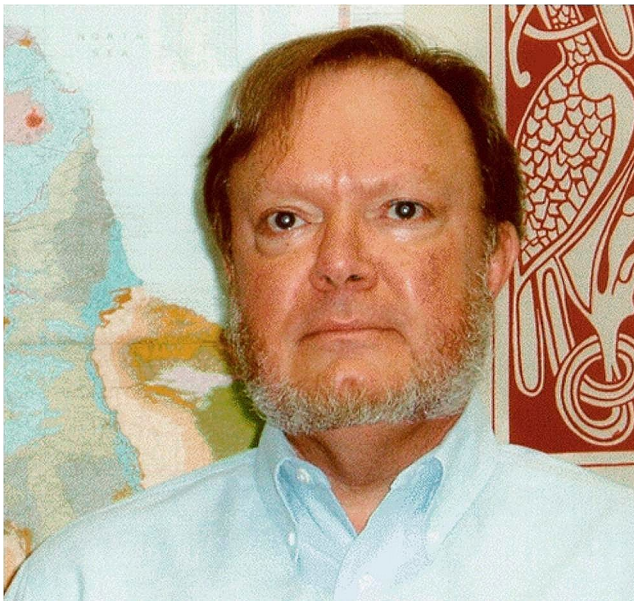




George McGhee—Visionary Scientist and Pioneer in Evo-Devo

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George McGhee

George McGhee, author of “Revisiting Edward D. Cope’s ‘The Relation of Animal Motion to Animal Evolution’ (1878)”¹ in this issue of *Biological Theory*, died on December 21, 2023, just weeks after this contribution to the

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journal’s “Classics in Biological Theory” series was in its final form. Last year he also published a Perspective article on Cope in this journal: “Evolutionary Theoretician Edward D. Cope and the Extended Evolutionary Synthesis Debate” (McGhee 2023). In her message informing us of George’s death, his wife, Marae, wrote, “the Cope papers kept him going through illness.”

McGhee, a paleontologist and Distinguished Professor of Earth and Planetary Science at Rutgers University, was a creative force in evolutionary biology. He championed the use of quantitative methods, extending the “theoretical morphospace” framework developed by David M. Raup, his PhD supervisor at the University of Rochester, to investigate the processes of convergent evolution. Using rigorous statistical analyses and mathematical modeling, McGhee quantified and analyzed shape variation of fossils and extant organisms, identifying formal morphological connections between seemingly unrelated species. These concepts and methods were elegantly expounded in his two books in the *Vienna Series in Theoretical Biology* (sponsored, like *Biological Theory*, by the KLI (Konrad Lorenz Institute for Evolution and Cognition Research)): *Convergent Evolution: Limited Forms Most Beautiful* (McGhee 2011) and *Convergent Evolution on Earth, Lessons for the Search for Extraterrestrial Life* (McGhee 2019).

The KLI was fortunate to have McGhee participate in three Altenberg Workshops in Theoretical Biology as well as hosting him for two extended research stays. While at the KLI he engaged in a notable debate with the theoretical biologist Stuart Kauffman on the question of whether the potential pathways of biological evolution are infinite and boundless or limited and potentially predictable, an exchange vividly captured by Wim Hordijk, a KLI fellow at the time (Hordijk 2016).

George McGhee’s engagement with the phenomenon of convergent evolution helped transform it from a rare curiosity in the history of life to a subject of rigorous scientific study. The ambitiousness of his thinking also extended to philosophical (McGhee 2016), and behavioral and socio-ecological (McGhee 2021), implications of evolutionary

convergence. His convincing exposition of constraints in morphology and other living modalities contributed to increasing demurrals by evolutionary theorists (e.g., Orgogozo 2015) from Stephen Jay Gould's speculation that a replay of the "tape of life" would result in unpredictable ontogenetic and phylogenetic trajectories (Gould 1989).

Toward the end of his life, McGhee became increasingly captivated by the debate around the "extended evolutionary synthesis" (Müller 2017), finding a historical precedent in Cope's commitment to "an organism-centered evolutionary process in which organisms both shape and are shaped by their environments such that the activities of the organisms themselves play a role in their own evolution" (McGhee 2023). We will be poorer for not knowing where his curiosity might have led.

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