

believe that the many illustrations and diagrams alone are worth its price. For anyone who is new to the history of biology, *Haeckel's Embryos* will show you just what you have been missing and how applicable visual culture is to the teaching of biology.



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"Ontogeny recapitulates phylogeny." This dictum of Ernst Haeckel led to his creation of a series of diagrams showing the similarity of embryonic stages across phyla. In our post-Modern Synthesis world, it is hard to see why Haeckel's embryos should still raise hackles. But here we are, still discussing them.

Was Haeckel a villain or victim? Was he guilty of perpetrating outright fraud, in the spirit of Piltdown? Did he forge his embryonic grids with the intent to deceive and convince? Or did he innocently fill in gaps in his embryonic series because of the paucity of available material and "touch up" images produced by others? Or was he a bold pioneer, who fearlessly – but mistakenly – drew what he saw, as did Percival Lowell, Haeckel's contemporary, with his Martian "canals"?

If you have already made up your mind on these questions, then you will be both thrilled and dissatisfied by Hopwood's careful recounting of the times and tribulations of Haeckel and his embryos, a story that spanned 140 years and the development of imaging technology that grew through lithography, woodcuts, photogravure, daguerreotypes, and halftones. Ten years in the making, *Haeckel's Embryos* is neither a plug nor a pan of Haeckel or his images, but rather a "most comprehensive history of a scientific image" (p. 3).

Larger than Haeckel's images, Hopwood's grander purpose is to explore "how pictures of knowledge succeed and fail, become accepted and cause trouble This book focuses on Haeckel's embryos . . . the most fought-over images in the history of science" (p. 3). *Haeckel's Embryos* is presented in a beautifully illustrated, cloth-bound, 8½ by 11 inch edition with over 200 historical plates and images. Many appear for the first time outside their original publications.

After an Introduction that describes the author's purpose and premise, chapters 2–4 recount the growth of embryological studies and the development of embryological and developmental images. They then trace Haeckel's rise to become the most prominent Darwinist in Germany. Chapters 5–8 track how Haeckel's embryonic images were made and disseminated,

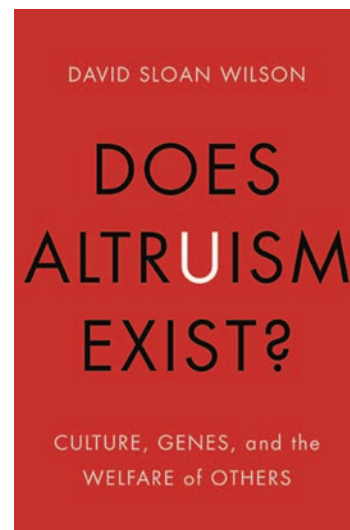
and end with the first controversy and accusations of forgery in 1875 by Rüttimeyer and His – claims exploited by antievolutionists and religious conservatives at the time. Chapters 9–13 follow the expansion of Haeckel's embryonic grids, his rise to celebrity status, and the social/political/religious polarizations that surrounded Haeckel and his embryos. These chapters record the ratcheting-up of vitriolic exchanges between Haeckel and his detractors.

The final chapters (14–18) recount the dust-up of the second controversy and accusations of forgery by Arnold Brass and the religious conservatives of the Kepler League that first brought the scandal of fraud before the public in 1909. Tarnished in Germany, Haeckel's embryos became widely disseminated in textbooks in the United States and Britain, where the forgery accusations were less well known. Interestingly, they were even included in the approved Tennessee biology textbook following the Scopes "Monkey" trial in 1925. The section ends with the "rediscovery of Haeckel's forgeries" by American biologist Michael Richardson in 1997, who declared them "fakes" (p. 286) – a claim that inflamed the Intelligent Design firestorm led by Phillip Johnson and the Discovery Institute. Hopwood also mentions Jonathan Wells's antievolutionary shot-across-the-bow in the *American Biology Teacher* in May 1999.

Haeckel's Embryos is not a stodgy tomb covered in archival dust, as are some histories of science. Hopwood's writing is not only clear but highly engaging. This book is fun to read, chock-full of exhaustive detail made palatable by entertaining turns of phrase, word pictures, and puns. But *Haeckel's Embryos* may not be for everyone. If your primary interest (or need) is simply countering creationist intrusions into your already packed biology curriculum, you may be better served by reading the short essays found on the National Center for Science Education (NCSE) website. But if you are curious to learn the definitive and nuanced story of Haeckel and his embryos, or have an abiding interest in the philosophy and history of science, then this book is for you. Many of my scientific heroes are woven into the fabric of this fascinating story. I found myself fully engaged and repeatedly chuckling over Hopwood's wordsmithery. Then, on practically every page, I was forced to loiter and savor the beauty of the historical plates and images. Through it all, I learned so much. *Haeckel's Embryos* is a wonderful book.



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ALTRUISM

Does Altruism Exist? Culture, Genes, and the Welfare of Others. 2015. By David Sloan Wilson. Yale University Press and Templeton Press. (ISBN 978-0-300-18949-0). 180 pp. Hardcover. \$27.50.

In all honesty, I found this book to be a slog. It is part of the "Foundational Questions in Science series" and, as such, is written by a well-respected leader in this field, David Sloan Wilson. He took the opportunity to reflect over the vast quantity of literature in this area and attempt to distill what is currently known or unknown and some of the implications of the field. Wilson's writing style, while lucid and concise, is very academic rather than grippingly narrative. He typically writes abstract philosophical arguments, illustrated eventually with a few real-world examples. The reader needs to be willing to really concentrate as she reads to watch the argument gradually build. Thus, the appropriate audience likely will be more students than lay readers. The book is predominantly human-centered, with few references to other species. I expected this to be a case-by-case examination of seemingly altruistic behaviors throughout the animal kingdom, so I was disappointed, but examining other species was clearly not Wilson's original goal. Why focus so intently on the human species in this book? Beyond the obvious self-interested reason, Wilson claims that "Alone among primate species, we crossed the threshold from groups of organisms to groups as organisms Our ancestors managed to suppress disruptive forms of within-group competition, making benign forms of within-group selection and between-group selection the primary evolutionary forces" (p. 49).