

the Titchbourne case is going on ... Then to poor Sir John Herschel's funeral ... Then I went to the Science Commission; Then to the House of Commons, where we had two divisions on the Westmeath Bill. We dined at Cecil Chaplin's ... Then we went to the Queen's Ball, after which I dressed again and went down to the House. Lastly, at 2 this morning, I got the House to consider the Lords' amendments to the Bank Holidays Bill ... (page 97).

This was a man whose self-improvement manuals (*The Pleasures of Life*, 1887, and *The Use of Life*, 1894) could not be accused of being merely theoretical.

Hatton shows very persuasively how all these facets of Lubbock's life fitted together in the broad context of Victorian culture and politics. For example, the lessons provided by social insects and modern "savages" indicated by analogy the evolutionary paths of humanity and modern civilisation. It would appear that Lubbock was partly responsible for cementing the developmental analogies in evolution that remain so firmly lodged in the public mind despite the best attempts of the Neo-Darwinians to focus on synchronic evolutionary mechanisms. Another key instance of Lubbock's consistency was his insistence that economics was a science of the same nature as biology (or pre-history, for that matter); his comfortable, old-fashioned Whig certainties were embedded in the new-fangled settings of fact. Indeed, at times in the book one almost feels that if Lubbock had not existed, historians of science would have been compelled to invent him, so perfectly does he fulfil all the roles we ascribe to scientists of his day.

This is very much a biography, with most of its primary research focused quite tightly on Lubbock himself. Its broader context is provided by a thorough and astute reading of extant secondary literature. Whilst it contains no major surprises, it provides a valuable point-of-view on this period in science from one of its principal actors, embodying in a specific form the general analysis of Peter Bowler in *The Non-Darwinian Revolution* (1988) and, especially, *The Invention of Progress* (1989). It is a pleasure to read and I shall be recommending it highly to students on my nineteenth-century science course.

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ROBERT J. RICHARDS, *The Tragic Sense of Life. Ernst Haeckel and the Struggle over Evolutionary Thought*, Chicago: University of Chicago Press, 2008, xx + 551, illus., \$39.00.

This is a brilliant book. It is literally brilliant looking, with beautiful pictures including some of Haeckel's own vibrantly colored drawings. It is intellectually brilliant, offering an account of Haeckel as driven by tragic failures in love that colored his view of life. And the book is brilliant scholarship, drawing on a wide range of sources to paint a quite different picture of Haeckel's work than other scholars have achieved. Richards established himself as the master of romantic scientific thought with his *Romantic Conception of Life* in 2002. That more general study set the stage for this portrait of Haeckel and his work.

Most readers of this journal know something about Haeckel, like that he was a mirror for Darwin's evolutionary ideas, that he was not much of an original scientist himself, or perhaps that his some of his figures were fraudulent. Those are frequently repeated "facts" about Haeckel that pop up in textbooks, and even in the scholarly work of professional historians. As Richards shows persuasively, none of these is quite true. Yes, he was an enthusiast for evolution, which he saw as a way to blend materialism,

progress, and purpose, but his version was both Darwin-inspired and also Goethe-inspired and infused with German romanticism. So, not surprisingly, the story is much more complex than we thought. In part, Richards suggests, that is because scholars have failed to understand the role that the tragic played in Haeckel's life and work.

The first tragic episode for Haeckel was the death of his blond, beautiful, blue-eyed "soul mate," to whom he had been married only two weeks. Her short illness and death devastated the young romantic scientist, and as Richards makes clear, the tragic led to creativity. After a period immersed in grief, Haeckel buried himself in work, almost manically producing his *Generelle Morphologie der Organismen* in 1866. Richards argues persuasively that this was an homage to his lost Anna, and that he took a much more antagonistic approach to those he saw as opponents than he likely would have taken had she remained at his side. The work was a summary of evolutionary thought, presented as a big picture survey rather than as an argument grounded in rich observational evidence. His next book, *Naturliche Schöpfungsgeschichte*, was directed even more at the general public and took up human evolution directly and explicitly. These are the books for which Haeckel is best known, including by historians of science. And it is the familiarity with these books – and only these popular books – that distorts the understanding of Haeckel's contributions, according to Richards.

In fact, Haeckel took a number of trips to carry out detailed examination of marine life, and he produced magnificent studies of structure, function, comparisons, and natural history of diverse marine organisms. These include *Die Radiolarien* (radiolaria, in 1862), *Entwicklungsgeschichte der Siphonophoren* (jellyfish, in 1869), *Die Kalkschwämme* (on corals and sponges, in 1872), and *System der Medusen* (medusae, in 1879). In these detailed studies, the first of which greatly impressed Darwin, Haeckel discovered and documented details of early developmental processes on which he drew for comparative data in his popular works. In his discussion of these works, Richards establishes clearly that Haeckel was a serious scientist whose work warrants our close attention.

Yet it is the way Haeckel used the comparative data in his popular works that attracted the closest attention – to Haeckel's great dismay. The myth is that Haeckel forged his data, and this story remains in currency today. Richards's explanation should set the story straight. Yes, Haeckel (and his publisher) were extremely sloppy and used the same image for more than one embryo. The chicken, turtle, and dog looked so much alike because they really were alike – the identical images, in fact. That does seem like highly unacceptable practice, and critics at the time and since have jumped on this weakness of Haeckel's. Creationists, as Richards explains, have used this fact that what Haeckel himself claimed was important evidence was actually faked to question evolutionary thought altogether. Richards argues that Haeckel did not mean to commit such fraud, but that he was sloppy and under pressure during this period of manic response to his first personal tragedy. Yes, Haeckel did excellent and important science. But yes, he hurt his own case seriously with his mistake. He hurt the case of evolutionary thought, as well as his own personal reputation. As a romantic, he let his enthusiasm for the big ideas get in the way of careful presentation of a convincing argument.

In this magnificent book, Richards gives Haeckel a scientific reputation that he never quite secured during his life. The case is compelling that we should go back and look at Haeckel's scientific work, and not just at the gorgeous pictures that have often distracted historians. Thanks to Richards, we have a guide to the work and its context and impact. He has brilliantly illuminated this fascinating and tragic life.

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