

The Tragic Sense of Life: Ernst Haeckel and the Struggle over Evolutionary Thought.

*By Robert J. Richards. Chicago (Illinois): University of Chicago Press. \$39.00. xx* ◆ 551 p.

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The author provides a superb biography of Ernst Haeckel (1834–1919) in his exploration of 19th-century German biological thought. The title reflects both the personal tragedy in Haeckel's life and the penalty paid in most of living things as

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they experience the evolutionary process of natural selection. Richards explores the education and formative influences on the young Haeckel and the brief and tragic loss of his adored first wife, Anna, who died on his birthday, probably of an ectopic pregnancy. The pain of her death ruptured his last ties to religion and he rejected a supernatural worldview, adopting monism or militant atheism as his outlook for the rest of his life. Haeckel is best known as Darwin's most ardent champion in Germany and a popularizer of evolution for the general public, with his books being translated into many languages. He is also much maligned as a scientific fraud (for his illustrations depicting the biogenetic law, "ontogeny recapitulates phylogeny"), a polemic speaker and writer who alienated much of Germany's scientific elite, and an incipient racist whose books allegedly fed the race hygiene views of the Nazi Party that arose shortly after his death. Those accusations, widely circulated during his lifetime and again raised over the past 30 years by historians, have damaged Haeckel's reputation. Chapter by chapter, the author explores each claim and asserts that they are all false or distorted. He backs up his analysis with a meticulous scholarship citing archival documents and an immense literature.

The opening chapters provide a background to the Romantic Movement with the ideas of Goethe, Humboldt, and Schleiden exerting their influence on the young Haeckel. He completed medical school, but chose basic biological research as his life's work, especially the value of using a microscope for studying organisms and their composition. He chose radiolarians and used his artistic skills and gifts for exploring and collecting as means to produce a hefty award-winning monograph. The key to classifying these protozoa and relating them came from reading Darwin's *On the Origin of Species* when it appeared in its first German translation. Haeckel coined the terms ecology, phylogeny, and ontogeny, and urged these approaches as branches of evolution. He also developed experimental embryology 20 years before his students, Driesch and Roux, made it popular among biologists.

Richards argues forcefully that historians of science need both a narrative approach and a moral evaluation of their subjects. He cautions not to judge backwards from contemporary beliefs, but to infer the values associated with the times those subjects lived. This is a difficult task. Restoring the reputation of a major figure such as Haeckel and blunting the persistent myths that perpetuate themselves from our lazy habits of using secondary sources will require historians to check out Richards's account and look at his sources. This is a

fascinating book. It should be read carefully and avidly (the footnotes are steeped in forgotten knowledge) as the past sinks into our awareness and Haeckel's personality emerges.

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