

breeding in particular and agricultural breeding generally would have been scandalized by mouse sex is ludicrous.

Gregor Mendel: His Life and Legacy offers a concise cradle-to-grave-and-beyond account of Mendel interpreted along traditional lines, as the discoverer of the gene and the laws of heredity. Accessibly written and attractively illustrated, notably with original drawings by the author, it radiates admiration for Mendel the founder of genetics, engaging in myth-busting not to revise the image of Mendel familiar from textbooks but to present that image as accurately as possible, the better to appreciate Mendel's achievement—in the words of Fairbanks's concluding sentence—"as an enduring foundation for biology and as a timeless paradigm of experimental science" (p. 150). A geneticist by training, Fairbanks has become a leading Mendel specialist, esteemed especially for his work on long-standing concerns that the data reported in Mendel's famous 1866 paper on pea hybrids are too good to be true and—in collaboration with Scott Abbott, a German-English translator—for a superb new English translation of that paper, highlighting previously unnoticed echoes of the German edition of Darwin's *On the Origin of Species*, a copy of which Mendel owned and annotated. The translation is republished here as an appendix, while a chapter on Darwin and Mendel summarizes and amplifies the author's linguistic detective work.

This volume came out in 2022, when biologists marked the bicentenary of Mendel's birth. Since that year of celebration, books giving prominence to revisionist perspectives on Mendel have appeared, among them one of similar length but contrasting mission to Fairbanks's book—*How We Get Mendel Wrong, and Why It Matters: Challenging the Narrative of Mendelian Genetics*, by the biology educator and historian Kostas Kampourakis (2024, Boca Raton (FL): CRC Press; reviewed in *QRB* 99:233–234). As someone who—full disclosure—is a friend and a collaborator of both authors, I reckon that reading their volumes in tandem makes for the most valuable introduction to the historical Mendel, and the debates surrounding him, currently available.

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DISPUTED INHERITANCE: THE BATTLE OVER MENDEL AND THE FUTURE OF BIOLOGY.

By Gregory Radick. Chicago (Illinois): University of Chicago Press. \$112.50 (hardcover); \$37.50 (paper). xii + 630 p.; ill.; index. ISBN: 978-0-226-82270-9 (hc); 978-0-226-82272-3 (pb); 978-0-226-82271-6 (eb). 2023.

The "rediscovery" of Gregor Mendel's landmark 1866 publication (*Experiments in Plant Hybridization*) in 1900 led, as any student of the history of biology can tell you, to a revolution in the study of heredity and inheritance. There has long been a "canned" history of this revolution, tinged with the kind of regret only possible in hindsight. The early Mendelians, led by their figurehead William Bateson, were right to see in Mendel the fundamentals of the genetic biology that would be developed over the next century, but were too quick to dismiss Darwinian evolution by natural selection as an impediment to the nascent science of genetics.

A competing group, the biometricians, led by Karl Pearson and W. F. R. Weldon (the latter of whom is this book's central character), rightly saw that statistical analysis of populations was the way to understand evolving systems, but was too anti-Mendelian to appreciate the importance of genetics. The acrimonious and extremely personal fight between these camps that spilled out, roughly, from 1880 to 1910 delayed our inevitable arrival at contemporary evolution and genetics by at least 20 years.

Less well known is that an emerging consensus in the history of biology, developed over the last 20 or 30 years, has placed this story in serious doubt. The foundation of Gregory Radick's masterful volume is a comprehensive presentation of this new, alternative narrative. Far from being a lamentable backwater period in the history of science, these decades offer us a compelling, profound scientific debate between two views of how heredity might work. As recast by Radick, the Mendelian view, with its attendant genetic determinism (Mendel's peas are, after all, either yellow or green, either wrinkled or smooth, regardless of any influence from their environments) is pitted against a more holistic, Weldonian approach, in which what counts is the interaction between inherited determinants of characters and the environments, biotic and abiotic, in which those characters will develop.

This careful and gripping historical retelling occupies the first 250 pages of Radick's book, and the project would have been impressive enough had he stopped there. But the following chapters take these historical insights and push them in a host of novel directions. If Weldon's conception was a valid one, then why did it fail? Radick argues that it is Bateson's deft transformation of Mendel into "teachable principles, tractable problems, and technological

promise" (p. 380) that ensured its success. Could this success, counterfactually, have been duplicated by the Weldonian paradigm? Radick argues that it could have—on the basis of real-world testing of a Weldonian way to teach genetics, with the promise of giving our students a more sophisticated view, debunking genetic determinism. Here, on full display, is the utility of studying the history of biology: illuminating science in its contemporary complexity via the detailed consideration of recessive currents in its past.

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INSIDE SCIENCE: REVOLUTION IN BIOLOGY AND ITS IMPACT.

By Benjamin Lewin. *Cold Spring Harbor (New York): Cold Spring Harbor Laboratory Press. \$29.50. xiii + 327 p.; ill.; index. ISBN: 978-1-621825-01-2 (hc); 978-1-621825-02-9 (eb). 2023.*

ERNST HAECKEL: AUSGEWÄHLTE BRIEFWECHSEL. *Band 4: Familienkorrespondenz, März-November 1859. Historisch-kritische Ausgabe.*

Herausgegeben und bearbeitet von Roman Göbel und Claudia Tazus unter Mitarbeit von Kathrin Polenz. Stuttgart (Germany): Franz Steiner Verlag. €142,00. xxxiv + 720 p. + 28 pl.; ill.; personenregister, ortsregister, sachregister, and taxonomisches register. ISBN: 978-3-515-13447-7 (hc); 978-3-515-13496-5 (eb). 2023.

Ernst Haeckel was a compulsive letter writer to colleagues (Charles Darwin, Carl Gegenbaur, Thomas Henry Huxley, August Weismann), students (the brothers Oskar and Richard Hertwig, Wilhelm Roux, Hans Driesch), the famous (the dancer Isadora Duncan), and the near-famous (the sexologist Magnus Hirschfeld), and he kept up a large correspondence with his family. Beginning in 1921, scattered collections of his letters have appeared, often in fragmented form; perhaps only 10% of the extant correspondence of over 44,000 letters in the archives of Haeckel-Haus have been previously published. This entire correspondence is now available online in searchable format (<https://www.wissenschaftsgeschichte.uni-jena.de/en/ernst-haeckel-haus/ernst-haeckel-1834-1919-letters-edition>).

In 2012, the German Academy of Sciences, in cooperation with the archives, began a long-term project to publish selected correspondence to and from Haeckel in 25 hefty volumes, thematically organized. These print volumes also contain introductions based on the correspondence and augmented by Haeckel's diaries. The volume under review is the second of the letters to family (a review of the first

appears in *QRB* 93:359–360), sent mostly from Sicily and Würzburg, where the young student was enrolled in the most famous German medical school of the period. He had initially matriculated at the Berlin medical school, but found the lectures on botany boring, which drove him to seek a venue more oriented to research. Despite the change of institutions, Haeckel kept in contact with Johannes Müller, the well-known researcher at Berlin, and accompanied this famous naturalist to Helgoland (two islands in the North Sea) on a marine-biological research trip, which led to a portentous decision: to make research his vocation. He did not give up medicine but continued until obtaining his doctorate; he returned to Würzburg for the spring term (1855), where he became assistant to the pathologist and later statesman, Rudolf Virchow. He quite enjoyed working with Virchow, although later, in the 1870s, he would be accused by Virchow of fomenting socialism because of his evolutionary doctrines (R. Richards. 2008. *The Tragic Sense of Life: Ernst Haeckel and the Struggle Over Evolutionary Thought*. Chicago (IL): University of Chicago Press; pp.318–324).

At family gatherings during his visits from medical school, Haeckel had noticed his charming cousin, Anna Sethe, to whom he became completely devoted and whom he won over with Goethe's poetry. He wrote her in June of 1861: "What a great, inestimable, enviable happiness has bloomed in me during these years in which I have possessed the loveliest, purest maiden soul and the most noble, most beautiful friendship, and these continue to mature into ever more blossoms and happy fruit. Love and friendship! How happy they make me. I had earlier chosen science alone, but they promise me everything that science cannot give" (1927. Page 187 in *Himmelhoch Jauchzendem: Erinnerungen und Briefe der Liebe*, edited by H. Schmidt. Dresden (Germany): Verlag Carl Reissner. This volume contains Haeckel's letters to Sethe from spring 1858 to fall 1862. All translations are mine, unless otherwise noted).

After an engagement, Haeckel and Anna married in August 1862. Married life was bliss, but did not last long. In late 1864, Anna began suffering from severe abdominal pains; her misery became acute, with great tenderness in the area of the liver. On February 16th, Haeckel's 30th birthday and the day he learned of having won a scientific prize, Anna died. Haeckel became mad with grief, lying in bed for eight days in delirium; his parents thought he might commit suicide and, as a prophylactic, they sent him to Nice on the Mediterranean. He slowly recovered and eventually remarried, but on his birthday thereafter, his thoughts turned to suicide.

The volume under review includes letters to and from his parents, aunt, and fiancé. The introduction, illustrations, commentaries, and identifications are