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Michael Dietrich
Dartmouth College

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BOOK REVIEW

The rise of the classical gene: a review of *In Pursuit of the Gene: From Darwin to DNA*, by James Schwartz

Michael R. Dietrich

Department of Biological Sciences, Dartmouth College, Hanover, NH 03755, USA
Correspondence (email: michael.dietrich@dartmouth.edu)

In Pursuit of the Gene: From Darwin to DNA, James Schwartz. 2008. Harvard University Press, Cambridge, MA. 384 pp. ISBN-10 0674026705. ISBN-13 978-0674026704.

The birth of modern genetics and the rise of the classical gene are well-trodden ground for historians of biology. That said, a synthetic history of this period has been overdue. *In Pursuit of the Gene* offers an engaging narrative history of one of the most important periods in the development of modern biology.

Schwartz begins his story with Francis Galton, Charles Darwin's cousin and scientific admirer. Making good use of primary sources, Schwartz traces both the material and statistical bases of modern genetics as they flowed from Darwin and Galton on to Hugo de Vries and William Bateson as well as Walter Weldon and Karl Pearson. Gregor Mendel does not make his appearance until the fifth chapter. While Mendel and his rediscovery is not at all slighted in Schwartz's narrative, beginning with Darwin and Galton sets the stage for a rich understanding of the many strands of thought that contributed to genetics at the end of the 19th century. A lively discussion of the controversy between biometricians and Mendelians gives way to two well done chapters on the cellular basis of heredity and the important early work carried out on sex chromosomes. The story of how Mendel's elements are transformed into genes as physical entities linearly arranged chromosomes culminates in Thomas Hunt Morgan's fly room at Columbia University. The rise of *Drosophila* genetics and especially the role of H. J. Muller on the gene and mutation become the chief concern in the last third of this book.

The introduction of H. J. Muller takes *In Pursuit of the Gene* away from a more synthetic history of classical genetics toward a biographical sketch of Muller's science and life dur-

ing the first few decades of the 20th century. Written with a clear appreciation of Muller's personality and his genius, this section of Schwartz's book provides a nuanced perspective on the early days of *Drosophila* genetics. At points, *In Pursuit of the Gene* seems like a new hybrid of Elof Carlson's two books, *The Gene: A Critical History* and *Genes, Radiation, and Society: The Life and Work of H. J. Muller*. Yet, Schwartz misses the great lesson of Carlson's account of the gene where he reveals that Muller's work on the left-right test and position effect ultimately contributed to the fragmentation of the gene concept that he had worked so hard to establish. Schwartz addresses this part of Muller's research briefly and without any greater contextualization, even though he dwells on Muller's life in the Soviet Union and Edinburgh at the time. We are left then with a rich account of the rise of the classical gene and Muller as an intriguing geneticist, but not the tumult that followed as genetics transitioned into a modern molecular science. This shift to Muller also pulls Schwartz away from his earlier emphasis on genetics in relation to evolution. Given Muller's keen interest in the processes of evolution, this is an unusual decision that pulls Muller away from the emerging field of population genetics and evolutionary genetics, even though he would make foundational contributions to both.

Schwartz chooses to end *In Pursuit of the Gene* with a triumphal epilogue that jumps ahead to genomics. The message of this epilogue seems to be that Muller continues to be relevant to contemporary genetics. Certainly Muller's work on genetic variability and even eugenics in the postwar period continue to resonate today, but these are also topics that merit much deeper consideration. Instead of the careful narrative on conceptual change in genetics and the causes and circumstances of that change that characterize the early chapters of

this book, Schwartz condenses the history of molecular genetics and genomics to 25 pages that can only hit the highlights. Nevertheless, *In Pursuit of the Gene* is an engaging account of the earliest years of genetics and the rise of the classical gene concept.

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