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THE METAMORPHOSIS OF PLANTS.

By Johann Wolfgang von Goethe; Introduction and Photography by Gordon L. Miller. Cambridge (Massachusetts): MIT Press. $21.95. xxxi + 123 p.; ill.; index. ISBN: 978-0-262-01309-3. 2009.

Johann Wolfgang von Goethe has a special place in the history of science. A towering figure in German intellectual history, this poet, politician, philosopher, and naturalist is still remembered for his (unsuccessful) alternative to the Newtonian theory of color and as the founder of morphology. And it is in the context of biology where we can still find inspiration in Goethe's writings. His goal, first expressed in *The Metamorphosis of Plants*, was to understand nature's creativity manifested in the diversity of organic forms and the simple rules that govern their creation and transformation.

In the account of his Italian journey—a book that has acted as a guide for countless admirers following in his footsteps—Goethe recounts an Eureka moment in the botanical gardens of Palermo, where "it came to me in a flash that in the organ of the plant which we are accustomed to call the *leaf* lies the true Proteus who can hide or reveal himself in all vegetal forms" (p. xvii). The transformations and metamorphosis of simple structures thus held the key to the generation of the not only all exiting plant forms but also—and here we see the poet-scientist at work—all those that could exist.

This wonderfully crafted volume enables us to see Goethe's argument in a completely new light. Gordon Miller's photographs of plants (mostly those discussed by Goethe, sometimes close approximations) allow readers to see and contemplate the underlying generative rules governing the metamorphosis of plants. We can thus follow Goethe's reasoning in its visual/contemplative and logical/conceptual aspects. The way Miller connects Goethe's argument with visual evidence sets a high standard for editions of classical volumes in the history of science.

Both historians and biologists will enjoy this volume. The latter, especially, will find much inspiration in contemplating the similarity between Goethe's attempt to find simple generative rules accounting for the diversity of life and our current understanding of regulatory logic of genomes.

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PLANT TRANSPOSABLE ELEMENTS: IMPACT ON GENOME STRUCTURE AND FUNCTION. *Topics in Current Genetics, Volume 24.*

Edited by Marie-Angèle Grandbastien and Josep M. Casacuberta. Heidelberg (Germany) and New York: Springer. $269.00 (hardcover); $209.00 (e-book). xii + 330 p.; ill.; index. ISBN: 978-3-642-31841-2 (hc); 978-3-642-31842-9 (eb). 2012.

When asked by a group of theologians what he as a biologist could infer about the mind of the Creator, J. B. S. Haldane famously replied "an inordinate fondness for beetles." Haldane's response was in reference to the fact that at the time, insects made up more than half of the described species. In the light of recent advances in genomics, an equally appropriate response would be "an inordinate fondness for transposable elements." These self-replicating genetic elements are the most common genes in nature and make up over 80% of some plant genomes. A book dedicated to the transposon biology of plants, the taxa in which transposable elements were first discovered, is therefore highly awaited.

For the 16 chapters of this volume, the editors have brought together contributors from all corners of the diverse field of transposon biology. The first few chapters provide an introduction to transposable element taxonomy and practical advice on how to detect transposons in sequence data. Next follows several chapters that discuss how different transposon families, including potentially plant endogenous retroviruses, shape different aspects of genome structure and size. The book concludes with chapters that deal with several exciting examples of phenotypic effects of transposons. In two intriguing chapters, the idea that some transposons persist by becoming co-opted to serve beneficial cellular functions is discussed. Although it is clear that most transposons are maintained due to their ability to self-replicate, an improved understanding of transposon exaptations may help explain the long-term persistence of some element families over others.

This volume is pitched to both transposon biologists and to nonspecialists. I fear, however, that the impressive amount of details included in most chapters will appeal more to the former than the latter category. There is little cross-referencing between chapters, which means that chapters can easily be read independently, but also that certain material is repeated across chapters. Overall, the book provides a good introduction to this very broad research field and will be a key reference for specialists. As emphasized by many of the contributors, the influx of next generation sequencing data means these are indeed exciting times for transposon biologists.

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