BOTANY

The Metamorphosis of Plants

By Johann Wolfgang von Goethe. Photographs and Introduction by Gordon L. Miller. 2009. The MIT Press, Five Cambridge Centre, 4th Floor, Cambridge, Massachusetts. 123 pages, 21.05 USD Cloth.

Plant morphologists have long been interested in the phenotypic appearance of plant forms. They are concerned with the external structures or forms of plants, especially the various growth forms that plants take, and how such morphologies contribute to the success of each species. Early in ancient times, human beings began to be interested in the phenomena of repetitive growth of plant shoots, both in vegetative and reproductive ways. The idea of the shoot as a plant unit had been recognized since the early days of botany, but until the 17th century, not many advances had been made on the botanical principles discovered by Theophrastus.

From the writings of Goethe, the idea of metamorphosis of plants, along with much other nature philosophy, was effectively promulgated. *The Metamorphosis of Plants* (1790) was Goethe's first major attempt to describe what he called "the truth about the *how* of the organism." Inspired by the diversity of flora, Goethe sought a unity of form in diverse structures. With this short but influential book, Goethe aimed to tell the story of botanical forms in process, to present in effect a motion picture of the metamorphosis of plants. Goethe essentially discovered the (serially) homologous nature of leaf organs in plants, from cotyledons, to photosynthetic leaves, to the petals of a flower. Goethe had arrived at a sophisticated view of homology and transformation within an idealist morphological perspective, which led to the definition of "homology" given by Richard Owen and Charles Darwin later. Goethe firstly stated that the lateral branches that spring from the nodes of plants may be regarded as individual plantlets, which take their stand upon the body of the mother, just as the latter is fixed in the earth.

Goethe's book is concerned with the metamorphosis of an ideal conceptual or abstract unit of plant structure into various actual physical expressions. Such a conception was to prove extremely fruitful, and homology has lain at the core of plant morphology ever since. His treatment of the leaf as an irreducible unit, to which certain other plant structures might be homologized, has long remained influential. The search for idealized plant parts seemed naturally to predicate some basic unit or other of which higher plants might be constructed.

Typological thinking is nowadays less evident in plant morphology, although it is by no means obsolete. Readers nowadays might be very astonished at the detailed and painstaking observational work, together with the overall vision of the idea of metamorphosis established by Goethe, which biology today recognizes as the truth of the plant. Stimulated by the thoughts of Goethe, later plant ecologists used the shapes and sizes of plants under the general rubric of physiognomy of plants or the life-forms and growth-forms, which creatively classified plants into biological groups based on the nature and organization or architecture of the shoot system, as an alternative to the species-genus-family scientific classification. An enormous amount of research in the field of vegetation analysis was also stimulated, based on plant morphological analysis.

The Metamorphosis of Plants was originally published in 1790, and it was reprinted many times in various editions from then on. This edition by MIT Press (photographs and introduction by Gordon L. Miller) illustrates Goethe's text with a series of surprisingly beautiful color photographs as well as numerous line drawings. It is the most completely and colorfully illustrated edition of Goethe's book ever published. It vividly shows Goethe's ideas of transformation and the interdependence of plant parts. Furthermore, this edition realizes Goethe's possible hope of providing pictures of all the plants to which he referred situated in the text, so that readers can see for themselves the specific points to which he was drawing their attention. All the previous publications of the book looked like only a skeleton, but this edition is indeed full of flesh and blood. Gordon Miller's wonderful photography and careful selection of images as well as his perceptive introduction greatly help readers easily understand the extraordinary nature of Goethe's achievement.

We can predict that this edition will further promote the popularity of Goethe's work. For those who have not yet read it, this edition will arouse their strong interest, and those who have read it will be interested in reading it again.

LI DEZHI[1] AND QIN AILI[2]

[1] Lab of Urbanization and Ecological Restoration of Shanghai; National Field Observation and Research Station in Tiantong Forest Ecosystem of Zhejiang; Department of Environmental Science, East China Normal University, 3663, Zhongshan Rd (N). Shanghai, China. 200062;

[2] Shanghai Vocational and Technical College of Agriculture and Forestry, 658 Zhongshan 2 Rd. Songjiang, Shanghai, China. 201600

Erratum The Canadian Field-Naturalist 126(4)

In response to the review of *Contributions to the History of Herpetology*. CFN 126(3): 344-345, the book's editor Kraig Adler pointed out (personal communication to FRC 12 May 2013): "Only one small correction. Mrs. Martof used a kitchen knife, not a gun. She told the police she slipped while cutting some pizza. But Bernie was stabbed up under his rib cage several times!"

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It has come to our attention that sections of many of the book reviews by Li Dezhi and Qin Aili were copied from sources without attribution. The journal and the authors apologize for this oversight.