CURRENT LITERATURE

BOOK REVIEWS

A history of botany

In considering a work professedly containing selections from the contributors to botany,[1] it is important to discover the reasons for the choice. Professor GREENE states that it is not his purpose to write a history of botany, or to treat in chronological succession of those who have upbuilt the science. As the introduction discusses a "philosophy of botanical history," the author's point of view may be looked for there.

There have been famous treatises on the philosophy of history, but there has been so little agreement that some are skeptical as to its reality. The author illustrates this from botanical writers, and concludes that. "everyone may be permitted to have his own philosophy." He proceeds to state his own in the following words: "Upon the historian of botany it seems to devolve that he shall have some forecast of what botany in its perfection as a science shall be like; for in practice he sits in judgment on each epoch and decides whether as an epoch its tendency was more to the advancement of the science or to its retardation; from which kind of procedure it becomes certain that some ideal of perfection is in his mind." What the ideal is in this history may be inferred from the closing paragraph of the introduction: "I am unwilling to conclude this introduction without repeating it, that the essence and substance of botany proper are organography and the logical deductions that we draw from organography. They may not be said to be the whole of the science, yet duly and comprehensively considered they will be found to come near it. The line of development of organography—organography as necessarily including terminology—is that along which a truly coherent and philosophic history of botany must needs be written." It is legitimate to ask how far the subjective is involved in this, and how it may shape the ideal of the historian. The work gives evidence throughout that the taxonomic features of botany and the related subjects receive the fullest treatment. Organography comes to its own in systematic botany. No fault can be found with this in itself, for each man should do what he is best qualified to do by training and experience. But when we deal with history as such, there is danger of confusing the advocate and the historian.

Considerable pains are taken to show that classifying is a very ancient process,

[1] GREENE, EDWARD LEE, Landmarks of botanical history. A study of certain epochs in the development of the science of botany. Part I, Prior to 1562 A.D. 8vo. pp. 329. Published by the Smithsonian Institution, Washington. 1909.

and that the roots of the science of botany are to be found before there was anything written. The author states that he has found no allusion among botanical writers to the fact of the universal existence of a crude primitive system of plant classification. The reviewer recalls that Dr. WHEEWELL, although not a "botanical writer," in his *History of the inductive sciences* develops in considerable detail the same idea, using botany and zoology as the best representatives of the classificatory sciences. The author seems to have laid emphasis on these older stages to show that due credit is not given to the older writers. This plea appears frequently in the book; one is not allowed to forget it. Such men as ADANSON, TOURNEFORT, and LINNAEUS were improvers, not creators. While granting all the truth there is in this, it seems to the reviewer that its importance has been overestimated. There has been some neglect in this respect, but the lack of definiteness and the changeableness in applying names and definitions have furnished a plausible excuse for the neglect.

Like SPRENGEL and MEYER, the author begins with the rhizotomi, or root-gatherers, who sought plants for religious, culinary, or medicinal purposes. Their experience, traditions, and written accounts were drawn upon by THEOPHRASTOS and others. The longest chapter, more than one-fourth of the volume, is given to THEOPHRASTOS, the "father of botany." It is based on a study of his *Historia plantarum*, a very full summary of its contents being given, with conclusions derived from their study. They are presented under the following heads: methods, vegetative organography, anthology, fruit and seed, anatomy, phytography, taxonomy, nomenclature, ecology, dendrology, and transmutation. I find phenology given in the case of TRAGUS, and physiology and pomology in that of VALERIUS CORDUS. These topics indicate what the author has sought or found in the works that have been studied. It is evident that he made a careful study of the *Historia plantarum*. In a recapitulation, containing seventeen items, there is a "list of facts botanical which THEOPHRASTOS saw, and in the main discovered." It is said to embrace "well-nigh all the first rudiments of what even today is universal scientific botany. It illustrates superabundantly the fact that THEOPHRASTOS, and no man of later time, is the father of the science as we now have and hold it." I find no reference, except in the biography and in two footnotes, to the other principal work of THEOPHRASTOS, the *De causis plantarum*, which in WIMMER'S edition of his works, in pure Greek text without note or comment, takes only twelve pages less than the *Historia*. It would not fit so well into the author's ideal, since it deals more with matters physiologic, ecologic, and especially economic, how plants behave, how they are to be treated in cultivation, etc. MEYER complains that botanists, in their proclivity for the *Historia*, have "hitherto neglected in an unjustifiable way" this other "not less important" work.

Another chapter deals with those Greek and Roman authors whose botanical writings have survived. The Greeks are NICANDER, who wrote in verse on poisons and their antidotes; and DIOSCORIDES and GALEN, physicians, whose works are pharmaceutical and medical chiefly. Among the Romans the most important is PLINY, much like DIOSCORIDES in his treatment of plants; VERGIL,

with his *Georgics* and *Bucolics;* and the writers on agriculture whose works are known under the title *De re rustica*. While all of these writers contributed something to botany, about all the phytography that has come to us from the ancients is to be found in the works of THEOPHRASTOS, DIOSCORIDES, and PLINY.

The remainder of the volume is taken up with those who have been called by the German writers "the fathers of German botany," or "the botanical reformers of the 16th century." Beginning with BRUNFELS and FUCHS, it is shown that to them is due an improved iconography, but not any reform in phytography. Their drawings from nature were substituted for the wretched and incorrect figures of the old herbals, but the accompanying descriptions were translations or compilations from the ancient authors. It was assumed that the plants of the Mediterranean region, which the old books described, grew in the fields and forests of Germany. Some changes were made by BRUNFELS in grouping plants, foreshadowing genera more akin to those now recognized, and real reform in phytography was made by BOCK, better known as TRAGUS. He studied plants in the field, and those not included in the older books were described in his clear and graphic style. Professor GREENE regards him as the "first father of phytography after THEOPHRASTOS." Although often paying close attention to the floral parts, he was still dominated by the idea that likeness in foliage, stem, and root, and sensible qualities like odor and taste, were better criteria of affinities than similarities in fruit and seed.

The two remaining chapters are devoted to EURICIUS CORDUS and his son VALERIUS CORDUS. EURICIUS published only one botanical work, the *Botanologicon*, but it so fully exposed the mistake of identifying the plants of Germany with those of the ancient writers that a decided advance was made in botany. To VALERIUS CORDUS the author assigns a high position, and from all that is known of his life and work he was an exceptional man. Dying at the age of twenty-nine, from exposure to the miasmatic climate of that part of Italy he was exploring in the heat of summer, it is felt that what was so well done in a life so short would have been greatly extended had his life been prolonged. In his *Geschichte der Botanik*, MEYER speaks of him as "a shining but fleeting phenomenon," and says "few have accomplished work of so many kinds and so great in so short a life." He was a lecturer on medicine, a botanical explorer, and a writer; and also a chemist and a mineralogist. TOURNEFORT speaks of him as "the first of all to excel in the description of plants"; and MEYER says that "his descriptions surpassed those of all his predecessors in precision and in the clearness with which they were brought home to perception" (*Anshaulichkeit*). Professor GREENE outlines the orderly plan of description adopted by CORDUS, and considers his special title to distinction to be that of "the inventor of the art of phytography," in doing away with the need of pictures of plants, and by showing that "every species could be so characterized in words as to be identifiable by description alone." His *Historia plantarum* was left in manuscript and was not published until several years after his death.

In these *Landmarks* Professor GREENE has made a very interesting and

important contribution to the history of botany for a period which is comparatively inaccessible to readers of English alone. One appreciates how gradually the science has evolved. Although the epoch-makers of the modern science were to come later, the roots of many of the leading principles are here disclosed. The style is clear and animated, requiring no needless effort to grasp the author's meaning. An excellent index is an additional source of satisfaction.—E. J. HILL.

Vegetation dynamics in the desert

There is no habitat where the vegetation appears more static than in the desert, but SPALDING[2] has now clearly shown that well-defined successions are to be found there as well as elsewhere, and that the "struggle for existence" involves "competition" between plant individuals as well as strenuous relations with untoward physical surroundings. The material here presented is the result of several years of intensive study on Tumamoc Hill (the location of the Desert Laboratory) and the adjoining valley, and it is concluded that the distribution of plants in that neighborhood can be accounted for by causes now in operation. The first chapter considers the plant associations and habitats. The river and irrigating ditches are relatively poor in aquatics. The river margin is fringed with an association in which cottonwoods and willows dominate, while the mesquite (*Prosopis velutina*) is the dominating species of the floodplain; an interesting phenomenon in the latter habitat is the invasion of the more xerophytic *Bigelovia Hartwegii*. Salt spots are present with characteristic halophytes, but the most pronounced of the latter (i.e., *Suaeda Moquini*) grows more luxuriantly along irrigating ditches than in salt spots. The washes, which are dry drainage channels, are characterized by the palo verde (Cercidium) and catclaw (*Acacia Greggii*), while the more xerophytic slopes are tenanted largely by the creosote bush (Larrea) and Franseria associations. The hill is characterized by Fouquieria and Parkinsonia on any exposure, while the giant cactus (*Cereus giganteus*) and *Encelia farinosa* are essentially south-slope species; *Lippia Wrightii* equally characterizes north slopes, which are also much richer in the aggregate number of species and individuals than are other slopes. An account of the lichens is given by FINK, Acarospora being the most characteristic genus; the lichens generally are unusually xerophytic in structure.

The second chapter considers the detailed distribution (with maps) of some of the more characteristic species, and the third chapter has to do with environmental and historical factors. An account of the geology of the region is presented by TOLMAN, and of the soils by LIVINGSTON. There are extensive tables depicting the soil moisture, rainfall, temperature, and evaporation. MACDOUGAL contributes an interesting chapter on the origin of desert floras; xerophytes are regarded as of recent origin, and the view, formerly current, that the desert xerophytes have arisen through adaptation is opposed, at least as a general explanation. The final chapters give a review, discussion, and summary.

[2] SPALDING, VOLNEY M. Distribution and movements of desert plants. pp. v + 144. *pls. 31*. Carnegie Institution of Washington, Publication 113. 1909.