

FLORAL MORPHOLOGY.

Praktikum für morphologische und systematische Botanik. By Dr. Karl Schumann. Pp. viii+610. (Jena: Gustav Fischer, 1904.) Price 13 marks.

THE morphology of the flower, although an important item in the curriculum of the advanced student of botany, is not infrequently compressed into a period quite insufficient for obtaining a knowledge of more than a few cohorts or families. But the relegation of this branch of botany to an uncertain stage is easily explained, since, as a course for training students, and this is the first object of a scientific curriculum, floral morphology does not offer the same scope as vegetative anatomy or physiology. Nevertheless, the art of discovering all the essential points of a flower is by no means easily acquired, while the ability to distinguish between critical genera and orders requires intuition, based upon experience and practice.

Dr. Schumann has prepared his book, in the first instance, for botanists who are dependent upon their own unaided efforts, thereby providing for that large class of enthusiasts who can only devote their leisure time to botany; but he had also in view the much higher object of leading those who use his book on to the plane, if not to the work, of systematists, and the final chapters deal with determination of species and the essentials of floral monographs.

The book contains two courses, of which the first is the easier, but it includes certain types, such as *Phaseolus* and *Iris*, which require some experience to explain thoroughly; the arrangement is according to the order of flowering. There are approximately 130 types of flowers, most of them common varieties, or easily obtainable, and these represent about 80 orders, which are, for the greater part, indigenous to Europe. There is a natural tendency to form a misleading conception of the importance of those orders which preponderate in the flora of one's own country, and for this reason it would have been advantageous to include representatives of more exotic orders, but since the aim of the author has been to present specific instances of floral variation and not systematic types, the choice seems to be very suitable. The keynote to the book lies in the author's inspiring enthusiasm for the study of foliar and floral morphology, and those who use the book will regret that Dr. Schumann did not live to see it completed. To Dr. Max Gürke was entrusted the responsibility of completing the book and of seeing it through the press. The discussion of each type includes general foliar arrangement, branching, inflorescence, floral parts, and methods of pollination, and each chapter has been made self-complete; in addition the author has contrived in a number of cases to derive from the specimen an illustration of some special theoretical point; thus the examination of the pine and fir cones introduces phyllotaxis, the balsam flower leads to the consideration of empirical diagrams, and the origin of double flowers is discussed in the case of the chrysanthemum. In dealing with questions for which different explanations have been offered, Dr. Schumann has carefully avoided dogmatic

statements, and, as a rule, gives the arguments, but leaves it to the student to form his own conclusions. There are several allusions to the rules of botanical nomenclature adopted in various countries, and the author inclines towards English practice in the matter; but the instances which he quotes, e.g. *Succisa pratensis* and *Ampelopsis hederacea*, are not the names adopted in the Kew lists for the plants in question. Mention is made of the botanical congress which will be held in Vienna this year, when the subject will be again under discussion.

It has hitherto been a difficulty to obtain a thoroughly trustworthy and full presentation on the subject of floral morphology except in Eichler's "Blutendiagramme"—copies of which are few and expensive—so that teachers and students will do well to note this book, since it contains a number of careful analyses of every-day types with a particularly clear account of inflorescences and bracts, and it may therefore be used for reference to confirm or correct the deductions based upon personal examination. The illustrations were drawn by Dr. Schumann's daughter, and these, like the descriptions, may well be taken as models which the student should emulate.

SCIENTIFIC ASPECTS OF LAWN TENNIS.

Lawn Tennis. By J. Parmly Paret. Edited by Caspar Whitney. American Sportsman's Library. Pp. xiv+419. (London: Macmillan and Co., Ltd., 1904.) Price 8s. 6d. net.

Great Lawn Tennis Players: their Methods illustrated. By George W. Beldam and P. A. Vaile. Pp. xxix+403. (London: Macmillan and Co., Ltd., 1905.) Price 12s. 6d. net.

IN the first of the above books we have an excellently illustrated and interesting volume dealing with the early history, development, and present condition of lawn tennis, the author having produced a treatise which will be heartily welcomed by all lovers of this healthy game.

The author quite rightly deals only with the play of those who have attained a very high order of execution, and are past masters as regards the manipulation of a rapidly moving ball. A plan of campaign, quick decision, and still quicker action on the part of the player are necessary for success, and when these are accompanied by accuracy of execution, steadiness, easiness of style, and good condition, greater achievement is attained. Modern lawn tennis is undoubtedly a combination of skill and science of a high order, and the reader will find described in these pages the different ways in which well-known players employ these fundamental desiderata. By an ingenious application of photography it has been possible to record the start, stroke, and finish of individual strokes on one plate, to illustrate the positions of the body, hand, wrist, and racket during the movement. Many illustrations of this kind are given, serving as valuable guides to correct action. Numerous other snapshots of positions of play taken singly or on three plates with brief intervals form a special feature of this volume.