# PREFACE

This book deals with the principal groups of plants from the standpoint of their structure, reproduction, and development. It presents a survey of the plant kingdom with emphasis upon relationships as revealed by basic similarity in bodily organization and life histories. It gives an account of the general course of evolution that existing groups appear to have followed. It endeavors to interpret, as far as possible, the structural and developmental complexities of the higher plants in terms of the simpler conditions prevailing among the lower plants.

The principal groups of plants are taken up in an ascending sequence based on ever-increasing structural complexity. This order of presentation does not imply direct phylogenetic relationship between successive groups, even though in some cases such relationship may exist. It merely denotes different degrees of progress from what is assumed to have been a more primitive condition. Conclusions as to the derivation of one group from another are based on substantial morphological evidence, but are always tentative and subject to confirmation by paleontological evidence. A true understanding of phylogeny can rest only on the fossil record and, with a few notable exceptions, this is very incomplete.

The system of classification used as a basis for the presentation of the principal plant groups is at once simple and conservative. The older classification, which continues to be the one most widely used, has certain limitations, but these arise mainly from uncertainties regarding the affinities of many groups, particularly the lower ones. As long as these uncertainties remain, there is little justification for abandoning an established system of classification for a newer one. A somewhat simplified classification is adopted because of its greater convenience and because more detailed schemes may be found in advanced works dealing with special plant groups. It is comprehensive enough to embrace, under almost every class, the most important orders; but it generally does not include families.

Usually the outstanding features of each order are developed through a detailed discussion of one or, more frequently, of several of its representative genera. The distinguishing characters of the order are then given in the form of a summary. Likewise the characters of each class are summarized after all its members have been considered. These are usually presented with the characters of related classes, so that a com-

parison can be made. General conclusions are given at the end of the account of each of the major divisions of the plant kingdom, *viz.*, algae, fungi, bryophytes, pteridophytes, and spermatophytes. Here are emphasized the evolutionary tendencies within the group, its contributions to the evolution of the plant kingdom, and the interrelationships of its classes.

This book is designed for use in a two-semester course with adequate laboratory work. It is intended to follow a course in general botany, where the student has gained a knowledge of such material as the many available elementary textbooks present. In particular, the student should understand the cytological relations involved in alternation of generations, including the behavior of the chromosomes in vegetative mitosis, fertilization, and meiosis. Much material properly belonging to the special fields of plant anatomy, cytology, and taxonomy has been omitted from the present work, especially in the treatment of the angiosperms. Emphasis is placed throughout on the evolution of the plant kingdom as revealed by a comparative study of the morphology of the main groups. At the end of the book a list of supplementary readings has been added. These will serve to introduce the student to the current literature dealing with special groups and topics.

More than two-thirds of the illustrations are original, and most of these have not hitherto been published elsewhere. Some have been taken from the author's earlier writings. Of the figures borrowed from the works of others, for which credit is given in every case, almost all have been redrawn and are designated in the legends by the word "after."

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