**Fundamentals of
Botany Series**

Nonseed Plants: **Second Edition**
Form and Function

Fundamentals of Botany Series

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The Plant Cell
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Reproduction, Heredity, and Sexuality
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Evolution and Plants of the Past
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Nonseed Plants: Form and Function
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Vascular Plants: Form and Function
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Plants, Man, and the Ecosystem
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Plants and Civilization
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Preface

Nonseed Plants: Form and Function provides an essential core of information for the beginning student who meets lower plants for the first time. All chapters have been revised in the light of our greatly increased knowledge of the nonseed plant in the last seven years. The role of the electron microscope in expanding our vision of their morphology and ultrastructure is reflected in the electron micrographs included in the illustrations. Data from biochemistry, physiology, and developmental studies is included in the discussion of the organisms and in establishing their evolutionary relationships. Although new material has been added to all chapters, there has been extensive reworking of those chapters (viruses and bacteria, fungi, slime molds, blue-green algae, and euglenoids) where the research has been most intensive. The features which proved particularly useful in the first edition, such as the summary of the evolutionary relationships at the end of the chapters, have been retained and refined. Furthermore, new illustrations have been added throughout, including some excellent electron micrographs, and virtually all line drawings have been elegantly redone.

Because the coverage of this second edition has been extended to include the nonseed-producing vascular plants, a change in title was necessitated. At this time, I would like to gratefully acknowledge the encouragement and constructive criticism of the many teachers and students who have used the first edition. I would like especially to thank Dr. Elizabeth Gantt, who read and made many valuable suggestions on the manuscript of the first edition. I also wish to express my gratitude to all who have kindly allowed me to use their illustrations in this book. Specific acknowledgment is found in the picture captions.

Series Foreword

Because of the immensity and complexity of the field of botany, the great diversity of plants, and the many methods of plant study, the problem of how to present to the student the highlights of botanical knowledge gained over centuries is not easy to solve. The authors and editors of the volumes in this series believe that an understanding of plants—their parts, their activities, and their relationship to man—is of fundamental importance in appreciating the significance of life. To stress this concept, the form and function of plants, tissues, and cells are treated together. At all levels of organization, in each volume, information gathered by morphologists, physiologists, cytologists, taxonomists, geneticists, biochemists, and ecologists is combined.

Thus, in the volume on *The Plant Cell* by William A. Jensen, the structure and function of the various cell parts are discussed together—for example, mitochondria and respiration, photosynthesis and chloroplasts. The volume by Stanton A. Cook, *Reproduction, Heredity, and Sexuality*, combines the principles of genetics with the means of reproduction in the various plant groups. The present volume, *Nonseed Plants: Form and Function*, by William T. Doyle, and *Vascular Plants: Form and Function*, by Frank B. Salisbury and Robert V. Parke, cover the major plant groups and discuss the plants in terms of morphology, physiology, and biochemistry. The relation of plants, particularly vascular plants, to their environment, to each other, and to man is covered in *Plants, Man, and the Ecosystem* by W. D. Billings. The form and distribution of plants of the past and their relation to the concepts of evolution are considered by Harlan Banks in *Evolution and Plants of the Past*. Herbert G. Baker, in *Plants and Civilization*,

discusses the importance of plants to man's social and economic development and the equally important consideration of man's role in the modification and distribution of plants.

In a series such as this, the editors are faced with the task of dividing a broad field into areas that can be presented in a meaningful way by the authors. There must be logic in the entire scheme, with few gaps and a minimum of overlap. Yet an instructor may not want to use the series of volumes in the sequence and manner preferred by the editors. Consequently, each volume must be usable alone and also in any sequence with the others. To achieve such a high degree of versatility is difficult, but we believe the series exhibits these features.

A concerted effort has been made by the authors and editors to maintain a consistent level of presentation. However, each author has been encouraged to approach his subject in his own way and to write in his own style in order to provide variety and to exploit the uniqueness of the individual author's viewpoint. Finally, while presenting the principles of botany we have tried to communicate the excitement of recent developments as well as the joy that comes with the extension of knowledge in any field.

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