

**ELEMENTARY BOTANY
FOR SOUTH
AFRICA, THEORETICAL
AND PRACTICAL**

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Elementary Botany for South Africa, Theoretical and Practical by Henry Edmonds & Rudolf Marloth

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HENRY EDMONDS & RUDOLF MARLOTH

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THEORETICAL AND PRACTICAL

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PREFACE

THE object of this text-book is as far as possible to give a general idea of the fundamental facts and principles of the science. In many elementary works the greater part of the book is taken up with mere structural details, the Physiology of the Plants being relegated to a short chapter at the end. I have endeavoured, whilst tracing up the growth and development of the plant from the seed, to treat of the functions of each organ at the same time as its description.

Through the liberality of the publishers, the book is well supplied with diagrams. It will not do, however, for the student to trust to these alone. No science can be properly studied from mere book-work, and this is especially true of such a science as Botany, which deals with various forms of natural objects. The student is strongly urged from the first to carefully examine specimens. A sharp penknife and a simple lens, which will only cost a few shillings, are all the apparatus required for dissecting and examining most flowers, and the commonest plants around us will well serve the student's purpose.

For some parts of the subject—as, for instance, the examination of Cellular Tissues—a microscope is needful. An excellent instrument can be obtained at any of the well-known makers' for about five or six pounds.

The student should also especially accustom himself to writing out descriptions of plants according to the model given at the close of the book.

H. EDMONDS.

CONTENTS

CHAPTER	PAGE
I. INTRODUCTORY	1
II. STRUCTURE OF THE SEED	3
III. CELL STRUCTURE	6
IV. CELL GROWTH, SHAPE, AND FORMATION	14
V. GERMINATION, ROOT GROWTH, STRUCTURE, AND FUNCTIONS	24
VI. STEM STRUCTURE AND FUNCTIONS	38
VII. BUDS AND RAMIFICATION	58
VIII. LEAF STRUCTURE AND FUNCTIONS	64
IX. BRACTS AND INFLORESCENCE	82
X. FLOWER STRUCTURE AND FUNCTIONS	87
XI. FRUIT AND SEED	112
XII. DISTRIBUTION OF SEEDS	119
XIII. MOVEMENT OF WATER IN THE PLANT TISSUES	121
XIV. WATER-STORAGE AND PROTECTION AGAINST THE EFFECTS OF DROUGHT	124
XV. INFLUENCE OF HEAT AND LIGHT UPON GROWTH	126
XVI. IRRITABILITY OF PLANTS	128
XVII. CLASSIFICATION AND SYSTEMATIC PART	131
XVIII. THE BOTANICAL REGIONS OF SOUTH AFRICA	189
XIX. HINTS ON MICROSCOPIC WORK	193
NAMES OF PLANTS MENTIONED	197
INDEX OF TERMS	203

ELEMENTARY BOTANY

CHAPTER I.

INTRODUCTORY—DEFINITION AND SCOPE OF THE SCIENCE.

BOTANY is the science which deals with those special forms of living organisms known as Plants. This at once raises the question—What do we mean by a plant? The higher forms of animal and vegetable life can be easily distinguished the one from the other; but when we descend to the lower forms we find it most difficult, if not impossible, to draw a line of demarcation between them.

The old distinction between the three kingdoms of nature was a simple one: minerals grow—plants live and grow—animals move, live, and grow. Putting aside for a moment the question as to whether minerals really grow, the phenomena of motion cannot be accepted as defining the difference between the two groups of living beings. Many plants, especially amongst the lower forms, are capable of motion at some time or other during their life. As an example, if we examine rain water that has been standing for some days, we generally find minute green masses floating about in it. These on inspection under a microscope prove to be true plants (*Protococcus pluvi-
alis*), each being a little rounded mass containing green particles. After watching for some time, however, it will be seen that some of these plants change their form, becoming more pear-shaped, at the same time giving off two very minute threads or cilia. These are thrown into rapid motion, propelling the plant

through the water in which it floats. In this mode of motion the *Protococcus* cannot be distinguished from many of the low forms of animal life.

A better distinction is to be found in the food that is assimilated. Plants, like animals, require food ; but they, as a rule, possess the power of obtaining it from the mineral kingdom only, whilst animals require for their food either vegetable or animal substances. There are, however, exceptions to this rule, and, as we have said, the two kingdoms appear to merge gradually the one into the other in their lower forms.

Botany, then, being the science which treats of plants, has several branches. *Morphology* deals with the forms of the organs of plants. *Anatomy* treats of their internal structure ; and *Histology* of the minute appearance they present under the microscope. *Physiology* deals with the functions of the various organs, and the phenomena attendant upon life. *Classification* has to do with the grouping of plants according to their relation one to another. *Geographical Botany* deals with the distribution of plants ; and *Palæontological Botany* with the remains of plants which existed in former times.