

**ELEMENTS OF VEGETABLE
HISTOLOGY: FOR THE USE OF
STUDENTS OF PHARMACY,
PREPARATORY TO THE STUDY OF
PHARMACOGNOSY**

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Elements of Vegetable Histology: For the Use of Students of Pharmacy, Preparatory to the Study of Pharmacognosy by Daniel Base

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DANIEL BASE

**ELEMENTS OF VEGETABLE
HISTOLOGY: FOR THE USE OF
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ELEMENTS OF
VEGETABLE HISTOLOGY

For the Use of Students of Pharmacy, Preparatory
to the Study of Pharmacognosy

WITH 65 ILLUSTRATIONS

BY
DANIEL BASE, Ph.D.,

*Professor of Chemistry and Vegetable Histology in the Department of Pharmacy,
University of Maryland, Baltimore*

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THE AUTHOR
1912

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PREFACE

This book is intended to serve as a guide for beginners in the study of plant tissues with the microscope, with supplemental instruction from the teacher.

The greater portion of the lessons deals with the tissues and their arrangement in the higher plants, but a few lessons are also included on the simplest plants, namely, some of those of the Thallophyte series, not only on account of their great importance in the life economy, but also to show the gradual increase in complexity of structure in passing from the extremely simple and minute plants of the Thallophyte series to the complicated, highly organized members of the Phanerogams, thus giving the student a view of the structure and characteristics of the whole range of the vegetable kingdom.

The opening pages deal with the physics of light rays in relation to reflection, refraction, lenses, formations of an image, with the description and explanation of the action of a compound microscope, its defects, the requirements for a good instrument, the measurement of magnification and of the size of objects, and the directions for using the microscope. Such information, of course, is necessary to one who pursues a course in plant histology, but it has an additional value that students are apt to overlook.

It enables the pharmacist to listen and speak intelligently when topics arise in which the microscope, etc., are a factor, and he is a better salesman in such places where microscopes and accessories are on sale.

In this day of Pure Food and Drug Laws, Pharmacognosy, or the morphological and histological study of individual official and unofficial plants for the purpose of recognition and detection of adulterations, is of great importance. To carry on such work intelligently requires, as a preliminary preparation, a general knowledge of botany and a working familiarity with general plant histology. This general plant histology the lessons in this book attempt to teach. It is not a book on Pharmacognosy, as it does not attempt to give the details by which one plant organ may be distinguished from another of the same class. For such purpose the student must be referred to works on Pharmacognostic microscopy, of which a goodly number have appeared in late years.

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In the present edition, numerous corrections and additions have been made to the old text, and three new chapters and three cuts have been added. In one of the new chapters, *Pleurococcus* belonging to the Algæ, and *Gleocapsa* and *Nostoc* belonging to the Schizophytes, all low forms of plants, are described. In another, an exercise in making a permanent stained mount of a section is given in detail. In the third, the examination for tubercle bacillus and gonococcus is described, in the belief that it might be turned to practical use by the pharmacist. Some of the additions made to previous chapters are the following: Eye-piece micrometer and measurement of objects; *Microsphaera* (Lilac mildew) under Moulds; a study of cell division; the work of the leaf, describing the role of the leaf in the life of the plant.

Section A and B of the Appendix have been entirely rewritten. Section A treats of stains, fixing and hardening agents, preserving fluids, clearing and mounting media, etc. Detailed directions for preparing and using stains, and the other agents mentioned are given. Section B treats of cutting sections, and gives exact details for imbedding specimens in paraffin or celloidin, and making permanent stained mounts of sections of such imbedded objects.

The progressive pharmacist is often called upon by physicians and those in charge of laboratories of hospitals for information in regard to stains, etc., and to prepare them, and therefore a description of such agents ought to be a matter of interest to him. In keeping with this idea, a new section, D, has been added to the Appendix, in which the more commonly used stains for animal histology are described, in the hope that this information will be useful.

In preparing the pages of this book, the author consulted a number of books, to which he desires to acknowledge his indebtedness. The books consulted were: *Encyclopædia Britannica*; Ganot's *Physics*; Behrens' *Botanische Mikroskopie*; Bessey's *Botany*; Goodale's *Physiological Botany*; Bastin's *College Botany*, and *Laboratory Exercises*; Bower's *Practical Botany*; Huxley and Martin's *Practical Biology*; Gray's *Lessons in Botany*; Greenish's *Foods and Drugs*; Sedgwick and Wilson's *General Biology*; Strasburger's *Botanisches Practicum*, and *Lehrbuch der Botanik*; Coulter's *Text Book of Botany*; Steven's *Plant Anatomy*; Chamberlain's *Methods in Plant Histology*.

The author is greatly indebted to his colleagues, Chas. C. Plitt, for aid in revising and adding to the text, and H. A. B. Dunning, for advice and assistance in preparing the section on animal stains. September, 1912.

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