

# **THE ELEMENTS OF BOTANY**

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The elements of botany by Sir Francis Darwin

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**SIR FRANCIS DARWIN**

**THE ELEMENTS  
OF BOTANY**



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ELEMENTS OF BOTANY



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WITH ILLUSTRATIONS

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## PREFACE.

THE Elements of Botany appeared in 1895, and with a few alterations was stereotyped in the following year. I take the present opportunity of correcting one or two obscurities or mistakes. If the book could have been rewritten it might have been advisable to introduce the conception of the *stele*, which helps to make clear the identity of the central vascular cylinders of the Dicotyledonous stem and root—a point in which the older terminology is less effective. For this purpose it is allowable to define the *stele* as a group of tissues characterised by the predominance of conducting elements and contained within an *endodermis*. Used in this sense the word *stele* also coordinates the vascular anatomy of the Dicotyledon with that of the fern-rhizome, whereas the term *vascular bundle*, used in these instances, may confuse the beginner. It seems to me that broad resemblances between different types of vascular arrangement are to the elementary

student of greater value than fine distinctions, and that a more elaborate view of the stele may be deferred until he has more knowledge of plant anatomy.

As this book originally appeared, the description of the germination of the bean contained a blunder which is now set right. I am indebted to Mr Heber Smith<sup>1</sup> for pointing out that the part played by the micropyle, in the emergence of the radicle, is often wrongly given. I regret that I have not room in the text for a fuller account of the process such as is supplied by Mr Heber Smith's letter.

The substance of the book was given in the form of lectures on Elementary Biology to Cambridge students. This—the Botanical course for medical students—is now given by Mr F. F. Blackman, who has introduced certain improvements, notably in the addition of *Fucus* as a type of reproduction. But I think it will be found that whatever value my little book had as an introduction to the study of plants, it retains in relation to Mr Blackman's course of instruction.

Except where otherwise specified, the illustrations have been drawn from nature by Miss D. F. M. Pertz, and by Dr W. G. P. Ellis, formerly Demonstrator in

<sup>1</sup> *Nature*, Feb. 4, 1909.

Botany, to both of whom I desire to express my sincere thanks. Dr Ellis not only undertook the chief part of the drawings, but has also aided me in other ways in the kindest manner. I am particularly indebted to him for valuable help in the selection of laboratory material, and for the arrangement of the Appendix containing instructions for practical work.

To Mr Shipley, the Editor of the *Cambridge Natural Science Manuals*, I am indebted for much kindly co-operation.

FRANCIS DARWIN.

BOTANY SCHOOL, CAMBRIDGE.

*January, 1910.*