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BIOLOGICAL SERIES. THE  
ELEMENTS OF BOTANY**

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**FRANCIS DARWIN & ARTHUR E. SHIPLEY**

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THE  
ELEMENTS OF BOTANY

BY

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WITH ILLUSTRATIONS.

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## PREFACE.

**T**HE Cambridge course in Elementary Biology consists of forty-two lectures, and an equal number of mornings devoted to laboratory work. Of these, one third, or the work of fourteen mornings is given to the botanical part of the subject. The following fourteen chapters give the substance of the botanical lectures given in this way to Cambridge medical students: the Appendix gives the detail of the practical work which accompanies the lectures.

The course of instruction is necessarily founded on the Schedule for the First Examination for the M.B. Degree, in which the study of certain plants is prescribed. But the Schedule being of a wide nature, the character of the course must finally depend on those responsible for its conduct. In regard to the botanical part we have to some extent departed from the plan of the classical

*Practical Biology* of Mr Huxley and Dr Martin,—to which everyone, who teaches the elements of Natural History in this country, owes so much. We have not attempted to adhere to a small number of species, but have preferred to fix on certain phenomena and to make use, as far as the Schedule permits, of the plants which most strikingly and conveniently illustrate them. Thus instead of illustrating the morphology, physiology and natural history of flowering plants by means of *Vicia faba* alone, we use, in addition to the bean, *Ranunculus*, *Silene*, *Chrysanthemum*, &c. to illustrate floral structure; *Caltha* is used for the study of the ovule, *Helleborus* for the leaf, and the pear, cherry, gooseberry, sycamore, &c. for the fruit. In the same way we have tried to make use of the Cryptogams occurring in the First M.B. Schedule as illustrative of certain facts and conceptions. Thus *Yeast* and *Spirogyra* illustrate nutrition, as well as the general structure of plant-cells; *Mucor*, *Spirogyra*, and *Pteris* illustrate reproduction. In selecting *Helianthus* and *Quercus* for histological work on the Spermaphytes we have been influenced by the fact that good practical descriptions of these plants exist in the *Practical Botany* of Professors Bower and Vines, and in Dr Marshall Ward's book, *The Oak*. To both of these works I desire to express my indebtedness.

Except where otherwise specified, the illustrations

have been drawn from nature by Miss D. F. M. Pertz, and by Mr W. G. P. Ellis, our Assistant Demonstrator in Botany, to both of whom I desire to express my sincere thanks. Mr 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.

BOTANICAL LABORATORY, CAMBRIDGE,  
*April 12, 1895.*