

PREFACE

MANY books have been published for the avowed purpose of making known our wild flowers. For botanical students there are the technical floras, and for those not familiar with botanical nomenclature there have been provided various artificial keys to our common trees, shrubs, and herbaceous plants. Formerly the study of botany consisted chiefly in "the mental gymnastics" of analyzing flowers to determine their names, but this is very far indeed from knowing them. The identification of a species should be regarded merely as an introduction and the beginning of a friendship long to be continued. The present volume treats of plants alive and in the midst of their home surroundings. There is no more attractive subject for investigation than the manifold ways in which flowers have solved their life problems, and have made use of both inanimate and animate agencies as pollen-carriers. The practical value of such observations cannot be easily overestimated, since they make the bee-keeper familiar with the resources of the honey flora, and save the fruit-grower from great disappointment and loss.

During many years the author has devoted a great amount of time to the observation of the life-relations of flowers. The forms and functions of the floral members have been carefully studied, and innumerable hours have been given to watching the behavior of the insect visitors and collecting them. For

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much of his time the field naturalist must be content with the companionship of Nature.

"The flower that on the lonely hillside grows
Expects me there when Spring its bloom has given;
And many a tree and bush my wandering knows."

The most important of insect pollinators is the honey-bee, and in order to become familiar with its economy I long since became a practical bee-keeper. Thus I have been able to approach the science of flower ecology from three different points of vantage. It will be evident in the following pages that the botanist, entomologist, or apiarist, who studies only one phase of this subject must necessarily obtain only a partial and imperfect view.

As a result of the supercritical spirit which has been abroad in the scientific world during the past generation most of the older biological theories have been called in question, and many new and bizarre suppositions have been advanced. The experience of the author has convinced him of the efficacy of natural selection in the evolution of flowers, of the advantages of cross-fertilization, and of the inheritance of acquired characters. In the absence of insect visits there is no satisfactory evidence that conspicuous flowers and their adaptations would ever have been developed. So highly improbable and quixotic are some of these new theories that biologists should not forget that common sense is an important factor in the interpretation of nature. Let us not mistake for giants what in reality are only windmills.

While technical terms have been avoided, great care has been taken to secure accuracy of statement. Such difficulties as occur, it is believed, will prove stimulating rather than discouraging. Most of the photographs are natural size, except

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in the case of a few of the larger flower-clusters, and have been taken on panchromatic plates to preserve in monochrome the proper color values. A small stop and a long exposure have been employed to secure details. By the aid of the figures the reader will be able to follow the descriptions with nearly as much ease as with the natural flowers. It is hoped that the volume may inspire in those who have been content in merely learning the names of flowers, a desire to know more of their biology, both past and present, and that in the schools, on the farms, and among all students of nature it may awaken a greater interest in the study of plant life.

Much of the material used in the preparation of the following chapters has appeared, partly in more technical form, and partly in popular articles in the *American Naturalist*, the *Journal of Animal Behavior*, the *Scientific Monthly*, *Entomological News*, *Psyche*, *Gleanings in Bee Culture*, the *A B C of Bee Culture*, *A Cyclopedia of Everything Pertaining to the Honey-Bee*, the *American Bee Journal*, the *Lewiston Journal*, etc. Without this long preliminary preparation they would probably never have been written. Grateful acknowledgment is also made to my wife for assistance in statistical and entomological work.

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