

**THE FIRST BOOK OF BOTANY. A
PRACTICAL GUIDE IN SELF-
TEACHING. DESIGNED TO
CULTIVATE THE OBSERVING AND
REASONING POWERS OF CHILDREN**

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The First Book of Botany. A Practical Guide in Self-Teaching. Designed to Cultivate the Observing and Reasoning Powers of Children by Eliza A. Youmans

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ELIZA A. YOUMANS

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BY
ELIZA A. YOUMANS.

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P R E F A C E .

THIS little book has a twofold claim upon those concerned in the work of education.

In the first place, it introduces the beginner to the study of Botany in the only way it can be properly done—by the direct observation of vegetable forms. The pupil is told very little, and from the beginning, throughout, he is sent to the plant to get his knowledge of the plant. The book is designed to help him in this work, never to supersede it. Instead of memorizing the statements of others, he studies the things themselves. The true basis of a knowledge of Botany is that familiarity with the actual characters of plants, which can only be obtained by direct and habitual inspection of them. The beginner should therefore commence with the actual specimens, and learn to distinguish those external characters which lie open to observation; the knowledge of which leads naturally to that arrangement by related attributes which constitutes classification.

But the present book has a still stronger claim to attention; it develops a new method of study which is designed to correct that which is confessedly the deepest defect of our current education. This defect is the almost total lack of any systematic cultivation of the observing powers. Although all real knowledge begins in attention to *things*, and consists in the discrimination and comparison of the likenesses and differences among objects; yet, strange to say, in our vaunted system of instruction there is no provision for the regular training of the perceptive faculties. That which should be first and fundamental is hardly attended to at all. We train in mathematics, and cram the contents of books, but do little to exercise the mind upon the realities of Nature, or to make it alert, sensitive, and intelligent, in respect to the order of the surrounding world.

Something, indeed, has been done in the way of object-teaching, although but little that is satisfactory. These exercises are notoriously loose, desultory, incoherent, and superficial, and hardly deserve the name of mental training. What is wanted is, that object-studies shall become more close and methodic, and that the observations shall be wrought into connected and organized knowledge. It is the merit of Botany that, beyond all other studies, it is suited to the attainment of this end. Plants furnish abundant and ever-varying materials for observation. The element-

any facts of Botany are so simple that their study can be commenced in early childhood, and so numerous as to sustain a prolonged course of observation. From the most rudimentary facts the pupil may proceed gradually to the more complex; from the concrete to the abstract; from observation to the truths resting upon observation, in a natural order of ascent, as required by the laws of mental growth. The means are thus furnished for organizing object-teaching into a systematic method, so that it may be pursued continuously through a course of successively higher and more comprehensive exercises. Carried out in this way, Botany is capable of doing for the observing powers of the mind what mathematics does for its reasoning powers.

Moreover, accuracy of observation requires accuracy of description; precision of thought implies precision in the use of language. Here, again, Botany has superior advantages. Its vocabulary is more copious, precise, and well settled than that of any other of the natural sciences; it is thus unrivaled in the scope it offers for the cultivation of the descriptive powers.

On purely mental grounds, therefore, and as a means of attaining the most needed of educational reforms, Botany has a claim to be admitted as a fourth fundamental branch of common-school studies; and the hope of contributing something to this end

has been the author's main incitement in the preparation of this rudimentary work.

It is needful here to state that the method of instruction developed in these pages is no mere educational novelty; it was tested and its fitness for the end proposed shown in practice by Prof. J. S. Henslow, of Cambridge, England. My attention was first drawn to it as I was looking about in the educational department of the South Kensington Museum, in London. In a show-case of botanical specimens, I noticed some slates covered with childish handwriting, which proved to be illustrations of a method of teaching Botany to the young. They were furnished by Prof. Henslow for the International Exhibition of 1851. He died without publishing his method, but not without having subjected it to thorough practical trial. He had gathered together a class of poor country children, in the parish where he officiated as clergyman, and taught them Botany by a plan similar to the present, though less simplified. The results of this experiment have been given to the public by Dr. J. D. Hooker, Superintendent of the Botanical Gardens at Kew, who was summoned to give evidence upon the subject before a Parliamentary Commission on Education.

The following interesting passages from his testimony will give an idea of Prof. Henslow's method of proceeding and its results :

Question. Have you ever turned your attention at all to the possibility of teaching Botany to boys in classes at school?

Answer. I have thought that it might be done very easily; that this deficiency might be easily remedied.

Q. What are your ideas on the subject?

A. My own ideas are chiefly drawn from the experience of my father-in-law, the late Prof. Henslow, Professor of Botany at Cambridge. He introduced Botany into one of the lowest possible class of schools—that of village laborers' children in a remote part of Suffolk.

Q. Perhaps you will have the goodness to tell us the system he pursued?

A. It was an entirely voluntary system. He offered to enroll the school-children in a class to be taught Botany once a week. The number of children in the class was limited, I think, to forty-two. As his parish contained only one thousand inhabitants, there never were, I suppose, the full forty-two children in the class; their ages varied from about eight years old to about fourteen or fifteen. The class mostly consisted of girls. . . . He required that, before they were enrolled in the class, they should be able to spell a few elementary botanical terms, including some of the most difficult to spell, and those that were the most essential to begin with. Those who brought proof that they could do this were put into the third class; then they were taught once a week, by himself generally, for an hour or an hour and a half, sometimes for two hours (for they were exceedingly fond of it).

Q. Did he use to take them out in the country, or was it simply lessons in the school?

A. He left them to collect for themselves; but he visited his parish daily, when the children used to come up to him, and bring the plants they had collected; so that the lessons went on all the week round. There was only one day in the week on which definite instruction was given to the class; but on Sunday afternoon he used to allow the senior class, and those who got marks at the examinations, to attend at his house. . . .

Q. Did he find any difficulty in teaching this subject in class?

A. None whatever; less than he would have had in dealing with almost any other subject.

Q. Do you know in what way he taught it? did he illustrate it?

A. Invariably; he made it practical. He made it an objective study. The children were taught to know the plants, and to pull them to pieces; to give their proper names to the parts; to indicate the relations of the parts to one another; and to find out the relation of one plant to another by the knowledge thus obtained.

Q. They were children, you say, generally from eight to twelve?

A. Yes, and up to fourteen.

Q. And they learned it readily?

A. Readily and voluntarily, entirely.

Q. And were interested it?

A. Extremely interested in it. They were exceedingly fond of it.

Q. Do you happen to know whether Prof. Henslow thought that the study of Botany developed the faculties of the mind—that it taught these children to think? and do you know whether he perceived any improvement in their mental faculties from that?

A. Yes; he used to think it was the most important agent that could be employed for cultivating their faculties of observation, and for strengthening their reasoning powers.

Q. He really thought that he had arrived at a practical result?

A. Undoubtedly; and so did every one who visited the school or the parish.

Q. They were children of quite the lower class?

A. The laboring agricultural class.

Q. And in other branches receiving the most elementary instruction?

A. Yes.

Q. And Prof. Henslow thought that their minds were more developed; that they were become more reasoning beings, from having this study superadded to the others?