BOTANY FOR YOUNG PEOPLE AND COMMON SCHOOLS. HOW PLANTS GROW, A SIMPLE INTRODUCTION TO STRUCTURAL BOTANY. WITH A POPULAR FLORA, OR AN ARRANGEMENT AND DESCRIPTION OF COMMON PLANTS, BOTH WILD AND CULTIVATED

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Botany for Young People and Common Schools. How Plants Grow, a Simple Introduction to Structural Botany. With a Popular Flora, or an Arrangement and Description of Common Plants, Both Wild and Cultivated by Asa Gray

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ILLUSTRATED BY 500 WOOD ENGRAVINGS.

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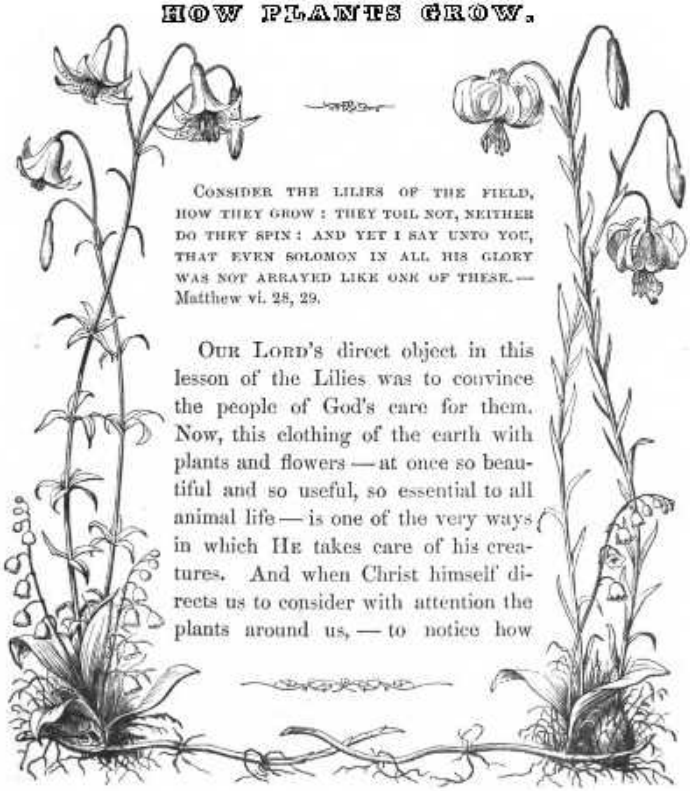
BOTANY FOR YOUNG PEOPLE.

Part First.

HOW PLANTS GROW.



CONSIDER THE LILIES OF THE FIELD, HOW THEY GROW: THEY TOIL NOT, NEITHER DO THEY SPIN: AND YET I SAY UNTO YOU, THAT EVEN SOLOMON IN ALL HIS GLORY WAS NOT ARRAYED LIKE ONE OF THESE.—Matthew vi. 28, 29.

OUR LORD'S direct object in this lesson of the Lilies was to convince the people of God's care for them. Now, this clothing of the earth with plants and flowers — at once so beautiful and so useful, so essential to all animal life — is one of the very ways in which HE takes care of his creatures. And when Christ himself directs us to consider with attention the plants around us, — to notice how

they grow, — how varied, how numerous, and how elegant they are, and with what exquisite skill they are fashioned and adorned, — we shall surely find it profitable and pleasant to learn the lessons which they teach.

Now this considering of plants inquiringly and intelligently is the study of BOTANY. It is an easy study, when pursued in the right way and with diligent attention. There is no difficulty in understanding how plants grow, and are nourished by the ground, the rain, and the air; nor in learning what their parts are, and how they are adapted to each other and to the way the plant lives. And any young person who will take some pains about it may learn to distinguish all our common plants into their kinds, and find out their names.

Interesting as this study is to all, it must be particularly so to Young People. It appeals to their natural curiosity, to their lively desire of knowing about things: it calls out and directs (i. e. educates) their powers of observation, and is adapted to sharpen and exercise, in a very pleasant way, the faculty of discrimination. To learn *how to observe* and *how to distinguish things* correctly, is the greater part of education, and is that in which people otherwise well educated are apt to be surprisingly deficient. Natural objects, everywhere present and endless in variety, afford the best field for practice; and the study when young, first of Botany, and afterwards of the other NATURAL SCIENCES, as they are called, is the best training that can be in these respects. This study ought to begin even before the study of language. For to distinguish *things* scientifically (that is, carefully and accurately) is simpler than to distinguish *ideas*. And in NATURAL HISTORY* the learner is gradually led from the observation of things, up to the study of ideas or the relations of things.

This book is intended to teach Young People how to begin to read, with pleasure and advantage, one large and easy chapter in the open Book of Nature; namely, that in which the wisdom and goodness of the Creator are plainly written in the VEGETABLE KINGDOM.*

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* *Natural History* is the study of the productions of the earth in their natural state, whether minerals plants, or animals. These productions make up what are called the *Three Kingdoms of Nature*, viz.: —

1. *The Mineral Kingdom*, which consists of the Minerals (earths, metals, crystals, &c.), bodies not endowed with life.

2. *The Vegetable Kingdom*, which comprehends Vegetables or Plants.

3. *The Animal Kingdom*, which comprehends all Animals.

The natural history of the mineral kingdom is named MINERALOGY.

The natural history of the vegetable kingdom is BOTANY, — the subject of this book.

The natural history of the animal kingdom is named ZOÖLOGY.

In the FIRST PART of this book we proceed to consider, under four principal heads or chapters, —

The SECOND PART of the book consists of a Popular Flora for Beginners, viz. a Classification and Description (according to the Natural System) of the Common Plants of the country, both Wild and Cultivated.

Then follows a Dictionary of the peculiar terms which we have occasion to use in describing plants, or their parts, combined with a full Index to Part I. Every science, and every art or occupation, has terms or technical words of its own, and must have them. Without them, all would be confusion and guess-work. In Botany the number of technical words which a young student need to know is by no means great, and a little diligent study and practice will make them familiar.

The first and most important thing for the student is, to know well the general plan of a plant and the way it grows; the parts plants consist of; the uses of the several parts; their general forms, and the names which are used to distinguish them. This is all very interesting and very useful in itself; and it is indispensable for studying plants with any satisfaction or advantage to find out their names, their properties, and the family they belong to; i. e. to ascertain the kinds of plants.

Let the learners, or the class under their teacher, therefore, in the first place go carefully once through the First Part of the book, or at least through the first two chapters, verifying the examples and illustrations given, as far as possible, with their own eyes, and searching for other examples in the plants and flowers around them. Then they may begin to study plants by the Flora, or Second Part of the book, according to the directions given in the last section of Chapter IV. Whenever they meet with a word which they do not remember or clearly understand, they will look it out in the Index, and refer back to the place in the first part of the book where it is used and fully explained. Remember that every one has to creep before he can walk, and to walk before he can run. Only begin at the beginning; take pains to understand things as you go on, and cultivate the habits of accuracy and nice discrimination which this study is eminently adapted to inspire. Then each step will render the next one easy; you will soon make more rapid progress; will be able to ascertain with facility the names and the structure of almost all common plants; and will gradually recognize the various and interesting relationships which bind the members of the vegetable creation together in natural families, — showing them to be parts of one system; varied expressions, as it were, of the thoughts of their Divine Author; planned in reference to one another; and evidently intended to enlarge and enlighten our minds, as well as to gratify our senses, and nourish, clothe, warm, and shelter our bodies. So the study of Botany — the most fascinating branch of Natural History, especially for the young — becomes more and more interesting the more we learn of it, and affords a constant and unalloyed intellectual gratification.

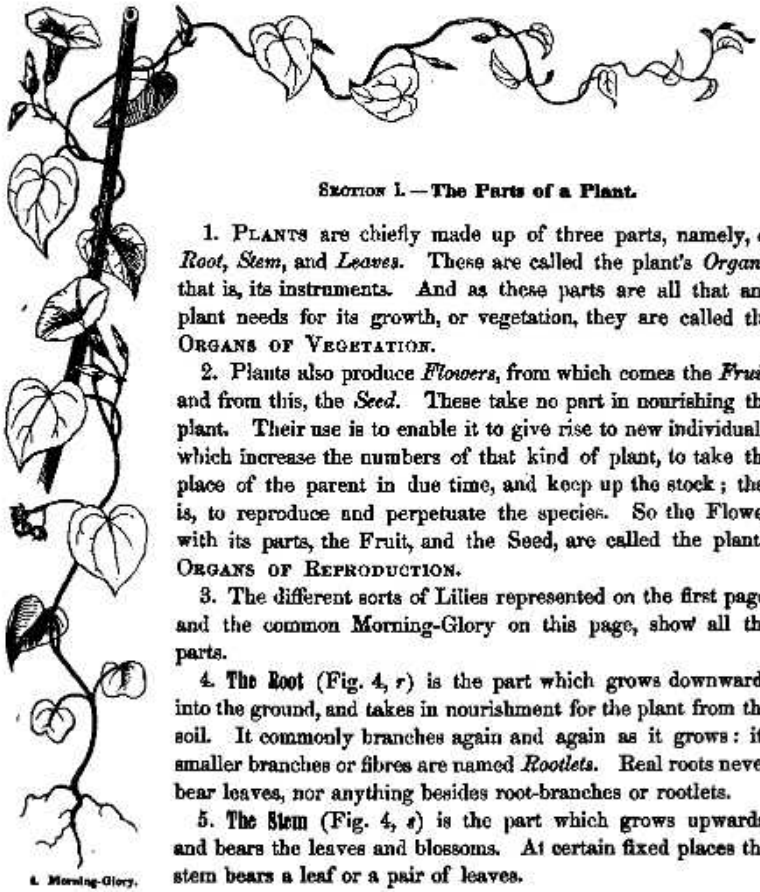
When young students have thoroughly mastered this little book, they will be well prepared to continue the study in the *Lessons in Botany and Vegetable Physiology*, and in the *Manual of the Botany of the Northern United States*, by the same author.

The illustrations are referred to throughout by numbers, with "Fig." prefixed. The numbers occasionally introduced, within parenthesis-marks, and without any prefix, (as on p. 25, line 1, and p. 36, line 9,) are references to former paragraphs, where the subject, or the word used, has already been explained.

*** The illustrations on the first page represent: — Fig. 1. Our commonest wild species of true Lily viz. the Canada Lily. Fig. 2. The Chalcedonian Lily, a native of Palestine, with scarlet flowers, supposed to be "The Lily of the Field" to which our Saviour referred in the Sermon on the Mount. Fig. 3. Lilies of the Valley, not true Lilies, but belonging to the Lily Family.

CHAPTER I.

HOW PLANTS GROW, AND WHAT THEIR PARTS OR ORGANS ARE.



4. Morning-Glory.

Section 1. — The Parts of a Plant.

1. Plants are chiefly made up of three parts, namely, of *Root*, *Stem*, and *Leaves*. These are called the plant's *Organs*, that is, its instruments. And as these parts are all that any plant needs for its growth, or vegetation, they are called the Organs of Vegetation.

2. Plants also produce *Flowers*, from which comes the *Fruit*, and from this, the *Seed*. These take no part in nourishing the plant. Their use is to enable it to give rise to new individuals, which increase the numbers of that kind of plant, to take the place of the parent in due time, and keep up the stock; that is, to reproduce and perpetuate the species. So the Flower with its parts, the Fruit, and the Seed, are called the plant's Organs of Reproduction.

3. The different sorts of Lilies represented on the first page, and the common Morning-Glory on this page, show all the parts.

4. **The Root** (Fig. 4, *r*) is the part which grows downwards into the ground, and takes in nourishment for the plant from the soil. It commonly branches again and again as it grows: its smaller branches or fibres are named *Rootlets*. Real roots never bear leaves, nor anything besides root-branches or rootlets.

5. **The Stem** (Fig. 4, *s*) is the part which grows upwards, and bears the leaves and blossoms. At certain fixed places the stem bears a leaf or a pair of leaves.