





Hermelinda Villarreal  
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"AND GOD SAW THAT IT WAS GOOD." GEN. I. 12.

Explanatory  
Preface.  
Introduct

CONTENTS.

FOR BEGINNERS:

BIBLIOTECA

AN

CONTRIBUTION TO MRS. LINCOLN'S

LESSONS ON BOTANY,

FOR

SCHOOLS, AND THE YOUNGER PUPILS  
OF SCHOOLS AND ACADEMIES.

BY LINCOLN PHELPS,

Author of "ELEMENTARY PHILOSOPHY," "CHEMISTRY," "FIRMSIDE  
PHYSICS," "MATHS WITH MY PUPILS," ETC.

SEVENTH EDITION, SEVENTEENTH THOUSAND.

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"AND GOD SAW THAT IT WAS GOOD." - GEN. I. 12.



NEW EDITION

OF

**BOTANY FOR BEGINNERS:**

BIBLIOTECA

AN

INTRODUCTION TO MRS. LINCOLN'S

**LECTURES ON BOTANY,**

FOR

THE USE OF PUBLIC SCHOOLS, AND THE YOUNGER PUPILS  
OF HIGHER SCHOOLS AND ACADEMIES.

BY MRS. LINCOLN PHELPS,

AUTHOR OF "LINCOLN'S BOTANY," "PHELPS'S PHILOSOPHY," "CHEMISTRY," "FIRESIDE  
FRIEND," "IDA NORMAN," "HOURS WITH MY PUPILS," ETC.

TWO HUNDRED AND SEVENTIETH THOUSAND.

STEREOTYPE EDITION.

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COMMON NAMES OF PLANTS DESCRIBED IN THIS BOOK.

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EXPLANATION OF THE FRONTISPIECE.

PLANTS were made on the *third* day of the Creation. At the command of God, grass appeared upon the earth, the shrub and the tree, each yielding fruit, *after its kind, whose seed was contained within itself*, for the reproduction of the same while the earth should exist.

The plate represents the appearance of the earth at this exact period; darkness had been separated from light; the waters, gathered together, had left the land dry and solid for the support of vegetation. The sun had not yet been created; no animal existed; no eye but that of God then beheld the earth. We see represented the darkness still retreating from the light, as in the morning twilight. We must imagine the solemn silence which brooded over the broad earth: no hum of insect, song of bird, or lowing of animal was heard, for it was not until the fourth day (*or period of time*) that the sun was created; and not until the fifth day, that the earth became animated with living things, which had voices, and could move. The plants had only vegetable life; they were made for the use of the animal creation, and to adorn the face of the earth. The Creator beholding His work at this stage, "saw that it was good." The plate exhibits vegetation in different forms, grass and rushes by the margin of the waters. In the centre of the foreground of the picture, is a small plant with broad leaves; it is called the side-saddle plant.\* Back of this is the papaw tree † of the Tropics, with its rich clusters of

\* *Sarracenia purpurea*. See Plate III. Lincoln's Botany.

† *Carica papaya*. See Plate IV. Lincoln's Botany.

EXPLANATION OF THE FRONTISPIECE.

fruits. On the left is a strange-looking tree, resembling a gigantic fern; this is the sago tree.\* Further in the background we see the well-known oak, with its spreading branches; and far off on the horizon appears the outline of the banyan tree (see page 14). Coming back to the foreground of the picture, we see a little to the left of the centre a huge stalk of Indian corn, with its full ears of ripened fruit; its barren, staminate-flowers are conspicuous as a feathery crown at the summit of the stem; (see page 159, ZEA) yet, though they have no fruit, they are essential in the vegetable economy to the production of the fruit from the pistillate flowers below, now changed into the golden corn, every thread of silk having been a long pistil to which the germ or infant seed was attached.†

\* *Cycas circinalis*. See Plate VII. Lincoln's Botany.

† See Lincoln's Botany, Natural Order, Gramineæ, page 298.

P R E F A C E

TO

J. B. LIPPINCOTT & CO.'S NEW EDITION OF MRS. LINCOLN  
PHELPS'S "BOTANY FOR BEGINNERS."

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THE author has seen with regret that the study of Botany in Primary Schools, and Juvenile Classes in Seminaries and Institutes, has of late become less popular than formerly. She would urge that when made interesting, as it may be, this study is pleasing to the pupil, and useful in its effects on the mind, leading to the love of flowers, to healthful exercise in collecting them, and by the beautiful analytical process of classification, teaching a practical logic.

But it is useless to attempt to interest Beginners in Botany by presenting to them the abstruse principles of physiology, and wearisome research into the various supposed, but doubtful alliances among the vegetable tribes. Under the attractive name of the "Natural System," learned Botanists have brought together most *unnatural* combinations and *unsystematic* arrangements. Let Beginners be satisfied with simple steps at first: may there be found among such some future Linnæus, who will gather up the disjointed fragments of the Natural System into one harmonious organization!

Better that the young should know something of plants, even though they should not become learned Botanists, than that this great portion of God's works should be to them as one vast sealed book. Our senses may enjoy the odour and the sight of flowers—they may appeal to our emotions as festal or funeral appendages, but God made plants for us to *study*, as well as to enjoy and love.



## INTRODUCTION.

### THE STUDY OF PLANTS.

God made plants for the study of man, as well as for utility and beauty. The seed, ever true to its nature, always brings forth the plant after its own kind; it is therefore the *essential organ*: on its structure is founded what is called the "*Natural System*" in Botany, the outline of which we will briefly state:

Take an acorn, (the seed of the oak), and then remove the outer coat or skin. The seed will voluntarily divide into two parts (called cotyledons, see page 93); nestled in a little cavity at one extremity of the seed is the germ, or embryo plant—this is a miniature oak tree. Now examine a kernel of Indian corn; you will not find it composed of two distinct lobes or cotyledons like the acorn. The germ is seen at what is called the eye of the seed.\*

We perceive in the beginning of the life of plants a great difference between plants of different kinds; this can be readily observed by placing seeds upon moistened cotton in a glass vessel, and watching from day to day the gradual development of the germ. In the difference in the manner of their growth is founded the great division of plants in the Natural System. In the full-grown oak, which has proceeded from the seed with two cotyledons, and in the Indian corn with one cotyledon, there are the following remarkable differences:

*First*—The oak has a *branching* stem. The corn has a *simple* stem.

*Second*—The oak has grown by the increase of tissues *from the outside* of the stem, and the wood is hardest towards the centre. The corn has grown from the *inside*, pushing outwardly, and is hardest at the outside.

*Third*—The leaves of the oak are *net-veined*. The leaves of the corn are *straight-veined*.

We shall now leave the pupil to begin the study of Botany, in which he will be led, gradually, to an understanding of the wonderful organization of the vegetable kingdom, and the different modes of classifying plants.

\* Refer to page 91 for an explanation of the seed and the germinating process.

### CHAPTER I.

#### *Advantages of the Study of Botany.\**

1. You are now about to commence a study which was formerly thought too difficult for children, but which is, in reality, much easier than many to which they usually attend.

2. In Grammar, you can have no assistance from maps or pictures,—every thing in this science depends on the powers of the understanding; and it affords no pleasant objects to delight the eye. But Grammar is a very useful study, and should be pursued while you are young; and other studies, especially the one you are about to commence, will help you to understand it.

3. Geography is easier than Grammar, because you may have maps or pictures of countries before you, and the eye impresses on the mind the relative situation of places, the direction of mountains, the course of rivers, &c.—but if, instead of maps, you could have the countries themselves before you, to examine with your eyes and hands, if you could see the people who live in them standing before you, how much deeper would be your impressions of Geography!

4. You are now to study Botany; here the objects about which you are to learn, will be placed before you, to *see*, to *touch*, and to *smell*. Thus three of your *senses* will be called upon to aid the *memory* and *understanding*; and as flowers are objects of much beauty and interest, your *imagination* also may be gratified.

5. Your *emotions*, too, will be warmed by the thought of His love and kindness who causeth the earth to bring forth, not only

\* NOTE.—It is important, for the teacher to ask the pupils to give the heads of the chapters, either at the commencement or close of the lesson.

1. What is said of the study you are about to commence?
2. What is said of the study of Grammar?
3. What renders Geography an easier study than Grammar?
4. Are the objects about which you study in Botany manifested to the senses?
5. What effect has the contemplation of flowers upon the emotions?