

HINTS ON USING BOTANICAL TEXT-BOOKS.

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In most of our schools, so-called Botany is taught only to Grade IX. And even here, it is not really *taught*.

Teachers who give the text-book to the pupils, and then require them to take the chapters in order miss opportunities of using field material in its proper season.

Don't follow the order of any text-book. Follow the order of the seasons; and look ahead.

Since *Beginners' Botany* by Bailey is prescribed in Nova Scotia and New Brunswick, and every teacher should have it whether she teaches Grade IX or not, I am venturing to suggest a good use to make of that book during November. In a future article, I shall offer similar suggestions for other months.

Chapter I is not important. The teacher should read it; and then ask the pupils to observe variations such as are mentioned here. Explain to the pupils that if there were no such thing as variation in plants, no new species or varieties could ever originate; and, consequently, none of our cultivated fruits, vegetables, grain and flowers could have been possible.

If any teacher has the use of *Introduction to Botany*, by Bergen and Caldwell, she should read Chapter XII for additional help on this topic. Much of that chapter, however, can be used later for winter discussion.

Chapter II is important. Don't ask the children to read it, however, until they have done some observation work. Take the children for a walk in the woods. Possibly they'll find, in a forest of fir trees, the ground literally covered with young fir seedlings two or three inches high. Are the big trees so close together? Then, can all these fir seedlings grow up to be trees? Certainly not. There won't be room for them. Which, then, will probably live, and which die? Isn't this a battle for life?

Observe, too, where the branches are longest and where shortest on the trees. Notice trees in an open field. Are the branches longer on the north or south side? If there should be any difference, ask why. Note also the length of branches in relation to the direction of prevailing winds.

Notice which plants die in the autumn. Notice which ones have annual stems, but perennial roots.

Makes list of annuals and perennials from *first-hand observation*.

After having done this, ask the older pupils (say, Grades VII to X) to read Chapters I and II. These chapters mean something now. The children will say they are "easy." Whereas if the reading were done before the field trip, it would be meaningless. After the reading, the children should take a second trip over the same ground to verify any points mentioned, which they had not noticed on the first trip.

Page 5 has suggestions enough to keep a class busy for a week.

The teacher should make good use of the "suggestions" given at the ends of the various chapters in the book.

The first two paragraphs of Chapter III belong with Chapter II. The remainder of that chapter can wait until a more convenient season in mid-winter.

Chapter VII should be begun before the ground freezes. Dig up a number of weeds, grasses, clovers, garden plants, etc., and study their roots. Wash off the mud, and put the roots in jars of water where the small rootlets will float into somewhat natural positions. Note particularly the small lumps on the roots of clover. Look for the same on sweet peas. Now read part of Chapter VII, and page 39.

Treat similarly Chapter IX.

Make a collection of leaves before they are all gone. If dried leaves are soaked in water, they will become pliable; and may be pressed the same as green leaves. This material will do for winter use with Chapter XI. The primary grades can make good use of this work. Avoid, of course, the technical terms in this chapter — at least until the facts can be described in common language.

Chapter XVI is very important. The teacher should study it carefully. Make your *hardwood* cuttings now according to directions on pages 125, 126. Include rose twigs among these.

Before the ground freezes, get in a supply of sand. Clean sand from the bed of a brook will be good. If any verbenas, petunias, pinks, snapdragons, etc., are still alive in any neighboring gardens, secure some cuttings at once. Follow directions on pages 122, 123. Start cuttings from house plants. Will all plants grow from cuttings?

Grafting may be left until spring. But practice work covering the mechanical operation might be