

of putrefaction. Bacteria have multiplied so rapidly as to render the water opaque. If a drop of this water, at the end of a week, be examined under very high power of the microscope it will be found teeming with moving bacteria. At the end of the fortnight, most of them are dead. When overcrowded, they seem to poison themselves, much as people crowded into an air-tight room for a long time would die.

In the talk on bacteria, the teacher will bring out the fact that some are beneficial and some are harmful. The latter point will introduce a lesson on hygiene — on the spread of contagious and infectious diseases. Similarly, the talk on fungi will introduce talks on plant diseases such as blackknob, apple scab, wheat rust, potato blight, rose mildew, etc.

The ambitious student will want to read all of chapter XXIV after the teacher has given the talks suggested. It would not be wise, however, to require students to read it. Many would try to memorize it without understanding it. That is useless.

"But what about examinations?" someone exclaims. If a student has a little first hand knowledge about *any* of these low forms of life, the examinations will take care of themselves. There is no need of trying to find out about *all* of them.

The section on Algae should be left until early summer.

Lichens, Liverworts, Mosses and a few Ferns are available whenever we have a "thaw" during the winter. As lichens grow on tree-trunks, we can get them at any time.

Their life-history is interesting; but no pupils would follow it first-hand. If the teacher choose to tell the story briefly of what others have discovered about these plants, all right. The point for children to get is that lichens are common and of many kinds. They read in *Evangeline* of "The bearded pines and the hemlocks;" but if asked about lichens the answer would be that they grow north of Arctic Circle. So they do. But they also grow on every tree and every fence pole that the child ever saw. Our grandmothers used them to make dyes. Let the children get acquainted with a half dozen lichens, whether they can name them or not.

The liverwort illustrated on page 196, should

be left until spring. A few leafy liverworts, however, can be found in the woods among mosses at almost any time.

Mosses are the most interesting plants for winter study. Although Bailey describes only two species, it is easy to find two dozen. Some mosses mature their spores in winter; others in spring; still others in summer or autumn. At all times, therefore, some species can be found "in fruit."

If your pupils are anxious to know the life-history of a moss, it would be folly to deny them the pleasure. Personally, I believe they might enjoy gathering mosses, noting the places where they grow, the conditions under which they grow, how they hold moisture for other plants, how they help regulate the flow of water in our forest streams, etc., even if they had never heard of *antheridia*, *archegonia*, *perichaetia*, *paraphyses* and a few other virtues these plants are supposed to possess.

The Club mosses are in good condition to study in winter. The Horsetails should wait until spring.

Teachers living near coal mines should compare the stem-markings of Club-mosses and Horsetails with fossil stems of larger size that the miners find away below the surface of the earth. A few geological stories would be appropriate here.

In general, then, my advice about chapter XXIV, is *Don't study it*. Use it, however, as a source of suggestive topics.

An inexperienced teacher will think that the identical plants named and illustrated are the ones she must teach. This is not the case. Good work will have been done if the children know something of bacteria in relation to their own welfare — even if they never have an opportunity to see one; if they know something of lichens and mosses and their place in the economy of nature; if they know the fungi that are enemies to our cultivated plants, and how to control them. A few scientists must study all the life processes of these plants. But the *average* school child will not necessarily become a scientist.

The British have captured the last stronghold of the Germans in the Cameroons; and a German warship has been captured by the British on Lake Tanganyika.