

### NATURE STUDY OF ANIMALS.

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The first part of this article is devoted to a series of exercises, intended to serve as hints to show how this phase of nature study might be taken up in class; the second part is devoted to a brief descriptive outline of some of the subjects treated in the exercises, and is intended chiefly for the teacher.

#### 1. Nature study exercises on the eggs of insects.

Use twigs of the apple and other trees on which you find the eggs of insects, e. g. the egg-mass of the Cankerworm or the Tent Caterpillar.

1. Introduce the work by showing a few twigs you have gathered for class illustration, with egg masses of the Cankerworm. Note the size of the twigs on which the eggs are usually found. What is the general appearance of the mass? How are the eggs placed and arranged?

After you are certain that the pupils know where to look for the eggs of the Cankerworm, and can identify them wherever found, direct them to search their own orchards and other apple trees near their homes, and each to bring a number of infested twigs for further study.

2. Ask each for a paragraph describing an infested twig. Have a particular twig sketched to accompany the written exercise. Insist on diagrams or sketches to the exclusion of pictures, in ordinary work.

Sketch an egg-mass enlarged, showing the arrangement of the eggs. And in subsequent study see that the following questions are considered: What will grow from each egg? How does this egg compare with the egg of the chick, in size, contents, and nature? Can you form any idea of the relative size of the Cankerworm on hatching? How large when full grown? From the description given in the December "REVIEW," do you think you have ever seen them? On what do they feed? How does this affect the tree and the fruit? What is the egg-laying form, in the life cycle of this insect? How does the orchardist combat these insects?

Discuss the best time of year to spray for (poison) Cankerworms.

3. Have each pupil in your class count the eggs in several masses, and record the number

for each mass. Gather all the data and place the figures on the board, asking the class to copy them and find the average. From the average determine something of the rate of increase of this insect in your locality, supposing the eggs yield males and females in about equal numbers.

What are the natural enemies of these insects? Tell of the work of birds, both in devouring the larvæ and the eggs.

Read accounts of the injury done by these insects, in Hodge's Nature Study and Life. Our Provincial Agricultural Reports and Experimental Farms Reports of the Dominion, always devote considerable attention to injurious insects, and frequently make mention of Cankerworms.

4. If you find the egg-rings of the Tent Caterpillar in your locality you may take them up in much the same way. Note that the eggs of the Tent Caterpillar surround the twig, and are covered with a resinous substance which quite obscures the eggs till it has been dissolved off with alcohol.

All the "Reports," mentioned above, have of late years contained references to the injury done by this insect.

5. Look for scales on the bark of apple twigs, similar to those pictured in Fig. 1, c. Poorly nourished trees, in neglected orchards, and along roads and in pastures, are usually badly infested with these scales.

After an introductory lesson, similar to that given on the Cankerworm, ask your pupils to search for Scale Insects, and bring the twigs to school. The search may be extended to a variety of trees and shrubs, as rose bushes, lilacs, hawthorn, mountain ash, red-osier dogwood, etc. Perhaps some one can supply specimens of Scale Insects from house plants. Ferns are especially susceptible to a large scale, which, although not the same species we find on our apple trees, illustrates very well the different phases in the life history of Scale Insect in general.

6. See that each pupil is provided with a twig infested with scales. Study more minutely their shape, size and color. How does crowding seem to affect their shape? Does their color vary on different colored trees? Do you find many scales on the growth of the past summer? Select fresh looking scales from the