

all were kept indoors. A great number of adults is expected.

These observations could be carried on in any school, whether rural or city, the cocoons being found commonly, even on the trees in the city streets. The only apparatus needed is a box letting in plenty of light, a notebook and plenty of green leaves, preferably apple, maple or hawthorn. It is very interesting to watch the stages in the change from egg to adult. Some schools are taking up this or similar work, and there is

nothing to prevent others from doing the same.

The accompanying photo shows the larvae a few days before the first cocoon was made. The coloring was beautiful, and we found the big fellows perfectly safe to handle—do not be afraid of them.

A photo and report of the observations were sent to the late Dr. James Fletcher. His response was full of praise and encouragement and expressed much satisfaction with the idea of keeping an accurate record.

Galls and Gall Flies

BY T. D. JARVIS, B.S.A.

THERE are sometimes swellings or excrescences upon the leaves and twigs of trees such as the ash, maple, willow, poplar and others as well as upon rose bushes and herbaceous plants, which, by their frequent appearance, have become well known and familiar to us. They are usually termed galls and have for a long time in connection with the insects which are contained in them and dwell therein been the subject of industrious research.

The word "gall" has three different and distinct derivations, which signify as many of its characteristics.

It is derived from the Anglo-Saxon word "gella," which denotes anything bitter. It has also the French word "galer" "to gall" for a derivation and from it come such ideas and expressions as "to tease," "to fret" or to annoy. The third derivation appears to

be from the Latin word "galla" meaning excrescences which appear upon the leaves and twigs of plants.

The word itself is very appropriate, as in most instances the flavor of these excrescences is very bitter and their manner of growth or the cause of them tend to annoy and harass the vegetable substances upon which they are found to exist. The word "gall" may, however, for the purpose of this treatise, be defined as a malformation of plant tissue induced by mechanical or chemical stimulus or by some cause not always known.

The excrescences are sometimes produced by fungus and bacteria, but those with which we now propose to deal are formed by the workings of insects and other small animals closely related to them, such as the acarids.

The abnormal, closed ball-like growths found so abundantly upon