

hard, bare subsoil excavated from the cellar, which is usually banked around the cellar walls. If the soil is not of good quality, it should be dug out, and good rich soil put in its place. Nor should vines be planted so close to the wall that they are deprived of moisture by overhanging eaves. On the other hand, the lack of eave-troughs may allow them to get more water than they can stand.

### THE BROWN-TAIL MOTH IN CANADA.

By Dr. Jas. Fletcher, Dominion Entomologist, Ottawa.

In 1902 Mr. William McIntosh, of St. John, New Brunswick, took a single male specimen of the brown-tail moth (*Euproctis chrysorrhoea*, L.) about 20 miles from St. John, N.B. About the same time another specimen was taken by Mr. Gordon Leavitt, at St. John, and in July of 1905, Mr. John Russell took a third specimen at Digby, Nova Scotia. Up to the present time these have been the only authentic records of this much-to-be-dreaded insect having been taken in Canada. Recently, however, I have received from Mr. C. Perry Foote, of Lakeville, Nova Scotia, one of the winter nests of the brown-tail moth, filled with the living caterpillars, thus proving that this insect has established itself at one place at least in Canada.

It was to be expected that the moths might be found here at any time, having been brought up direct from Massachusetts on one of the steamboats which ply regularly between Boston and the Maritime Provinces, but this would not necessarily prove that the insect had established itself. The occurrence of the young caterpillars, however, is a more serious matter, and shows that energetic measures are necessary at once to suppress and possibly to wipe out this unwelcome visitor before it becomes more widespread. The recognition of the winter nests is an easy matter, and this is the time of year to attend to their destruction. The brown-tail moth passes the winter as a very young caterpillar, and large numbers of these form colonies at the tips of the branches of the trees upon which they have been feeding the previous summer. The eggs are laid during July, and on hatching the caterpillars feed for some time on the upper surface of the leaves. As winter approaches they crawl to the tip of a branch and bind together a few leaves so as to make a tent. This is securely closed up with silk, and the caterpillars remain dormant all through the winter, and until the buds burst the following spring. These winter nests are easily recognized, from being almost invariably at the tips of the branches, and from being at this time of the year the only nests which contain colonies of living caterpillars. These latter are black, but covered with rusty hairs, and on the 10th and 11th segments towards the end of the body there are two reddish-yellow cushion-like tubercles, one on each segment, which the caterpillars can elevate or depress at pleasure.

#### WHAT TO DO NOW.

The only way in which the brown-tail moth passes the winter is in the shape of these half-grown caterpillars, little more than one-quarter of an inch in length, in colonies of between two and three hundred, inside these nests of leaves at the tips of the branches. These are easily seen, and everybody in Nova Scotia and New Brunswick who is concerned in the successful management of orchards, and every citizen who is interested in the beauty of the town he lives in, should examine and look to the destruction of every nest of leaves found to contain caterpillars, which he may notice. The destruction of these winter nests is the most effective means of keeping them within bounds.

#### A DANGEROUS ENEMY.

With the exception of the San Jose scale there are no two insects which have attracted so much public attention, nor with regard to which so much money has been spent in America by the State and Federal Governments of the United States, as the gypsy moth and the brown-tail moth. Both of these are pests introduced into America from Europe—the gypsy moth about 1869, and the brown-tail moth somewhere about 1890. Millions of dollars have now been spent on fighting the gypsy moth and the brown-tail moth in Massachusetts and the adjoining States. Dr. Howard, when treating of this insect, and an effort which is being made to introduce European parasites, says, in the Yearbook of the Department of Agriculture for 1905: "The brown-tail moth has become even more abundant and injurious than the gypsy moth, and, owing to the fact that the female flies readily, whereas the female of the gypsy moth does not fly at all, the brown-tail moth has far exceeded the gypsy moth in its spread."

#### PLANTS INJURED.

These caterpillars injure nearly all of the large and small fruits, and many perennial plants. The pear and apple seem to be favorites, but stone fruits, elms, maples and the oak are also commonly injured. A list of over 80 different kinds of food plants was published in 1903. Thousands of fruit trees in the vicinity of Boston, Dr. Howard says, have been killed by the brown-tail moth.

#### THE BROWN-TAIL RASH.

Not only are the caterpillars of this insect voracious upon the foliage of many kinds of trees, but

they cause much annoyance from their stinging hairs, which cause excessive irritation when they come in contact with the human skin. Each hair is barbed, and at the time the cocoons are spun these hairs are broken off and carried by the wind, when they fall on the neck and other exposed parts of the body, giving rise to the painful rash, which is very serious with some people, even although they may not have actually touched the caterpillars. Dr. Howard's assistants who have been working on this insect have suffered very severely, and persons engaged in removing the nests from trees in the winter time must be careful not to handle these nests too freely, or they may be inconvenienced by this rash. The nests should be cut off from the trees, placed in a basket with as little handling as possible, and burnt at once. Dr. Howard states that "a large part of the popular feeling in New England that the brown-tail moth must be exterminated, is due as much to the annoyance of this rash as to the loss of vegetation from the caterpillars." As a remedy for this rash a free use of vaseline is recommended.

#### DESCRIPTION OF INSECT.

The brown-tail moth resembles very closely the well-known fall webworm, being of a beautiful pure white, except the tip of the body, which in both sexes is brown, and from which the popular name is derived. The female bears at the tip of the body an almost globular tuft of brown hairs. Both sexes fly freely, and are much attracted to lights—a fact of some importance as affecting their spread. The search-lights of night-sailing passenger steamers has attracted so many as to have drawn the attention of the officers of such vessels, who reported that moths have alighted upon their ships in great numbers in the vicinity of Boston about midnight on several occasions, and the introduction of the species at more than one seaport in Maine is attributed by Dr. Howard to vessels coming from the infested districts rather than by natural spread by direct flight.

#### ONLY ONE BROOD IN THE YEAR.

The eggs are laid in masses containing about 300 eggs. These masses are brown in color from a thick covering of the golden brown hairs from the tip of the body of the female moth, and the whole egg mass more nearly resembles a silky, downy caterpillar than a cluster of eggs. These masses average about two-thirds of an inch in length by one-fourth of an inch in width, and are found on the lower surface of the leaves in July. The caterpillars hatch in August, but do not injure the trees much before winter. As soon as the buds burst in spring they are at once attacked by the caterpillars, which emerge from their winter shelters and do much harm.

#### SUMMER TREATMENT.

If the winter nests of the caterpillars have not been destroyed, trees should be sprayed with arsenical or other poisonous washes, so as to destroy the caterpillars during May and June. The caterpillars of the brown-tail moth are not so resistant to the poisonous effects of Paris green as are those of the gypsy moth. The spraying of all orchards with the poisoned Bordeaux mixture as a regular practice is recommended to all Canadian fruit-growers as the best general means of securing first-class fruit free of most of the ordinary pests which injure fruits. As the brown-tail moth caterpillars attack many other kinds of trees than fruit trees, it will be necessary that they should also be sprayed, and for this purpose Paris green may be used. A good useful poison wash consists of Paris green, one pound; fresh lime, one pound; water, 160 gallons. It is a very usual practice, however, among fruit-growers to use more than one pound of Paris green with lime in the 160 gallons, and, indeed, two pounds may be used without danger if two pounds of lime are added. Arsenate of lead is a newer remedy of great value, from the fact that it does not injure foliage so much, and remains on the leaves for a longer time. Three pounds of arsenate of lead may be used in 50 gallons of water without injury.

#### RESUME.

The brown-tail moth, which has been the cause of enormous loss in Europe and the United States, is, undoubtedly, established in one locality in Nova Scotia, and probably in several others. It is important to find out as soon as possible the range of infestation, and everybody is urged to send in as soon as possible any suspicious nests of insects, or clusters of leaves webbed together, particularly if they contain caterpillars, if they notice any on their trees.

The collection of the winter nests is the best and easiest means of controlling this insect.

The collection of these nests must be done carefully, with as little handling as possible, and all should be burnt at once when cut from the trees.

This work must be done before the buds burst.

Any trees bearing nests of the brown-tail moth after the buds have opened, must be sprayed with some poisonous mixture for the destruction of the caterpillars.

The establishment of the brown-tail moth in Canada is a serious matter, affecting everybody in the district where the insects occur.

What is now only a matter of considerable interest, may, if neglected, become a public calamity.

Specimens for examination may be sent to "The Farmer's Advocate," or to the Entomologist, Central Experimental Farm, Ottawa. If sent to the latter no postage will be required.

### ANNAPOLIS COUNTY, NOVA SCOTIA.

We have had a long winter. From the 25th of November to the 15th of April it has been possible to haul logs on snow anywhere in the forest. Every farmer is waiting for spring. Although a long, cold winter, there has been little depth of snow, probably not more than 20 inches at any time, and still we have had at least the usual amount of sleighing and sledging, consequently the frost has entered the ground to more than the usual depth. From present appearances we will have frost in the ground in May.

I wonder if any of your readers has noticed or will agree with what an old farmer told me not long ago? He said he had always noticed that after a winter in which there was little snow, that the ground dried more quickly after rains and suffered more from dry weather the following summer than if the winter had been one of heavy snowfall. I suppose if the fact were reduced to theory it might be explained that the soil is less thoroughly saturated by the melting snows of the winter in which there is a scarcity of snow, and therefore the rains of summer are more quickly absorbed. It was quite noticeable last summer that the ground became dry very quickly after each rain, and we certainly had very little snow in 1906. If this be the case, we shall need to get the cultivators at work soon after each rain the coming summer, for we shall need all the moisture we can get and keep. The precaution will hold good in any case, for the cultivator is never liable to be used too often. In our observations in this county, nine farmers use it once or twice during the summer—when it becomes absolutely necessary to keep down weeds—to one who uses it often to retain moisture. However, the right use and appreciation of the tool is gradually spreading, and wherever we see it used properly and often, we see better crops. As deforestation continues, we will be forced to adopt better methods of cultivation, and perhaps there is no more important subject for our Institute workers to keep before the farmers than this one of thorough and frequent cultivation.

The fruit trees have come through the winter seemingly in good shape. There seems to be an opinion prevalent among some of the old-time farmers that a certain sleet storm in March, which covered the trees with ice for three days, had the effect of destroying the eggs, etc., of insect pests. The greatest evil resulting from this belief will be that these farmers will take this as an excuse for not spraying.

Apples are pretty well sold out. Nonpareils have sold for \$3.00. R. J. MESSENGER.

## THE FARM BULLETIN.

### RETAILERS AND THE SEED CONTROL ACT.

In the eastern part of Ontario the competition is keen among the seedsmen, or, perhaps better, their agents. The result is one has an opportunity of making some comparisons. Occasionally we find a local dealer handling the seeds of three or more firms. At one point a farmer was told that the seed he was looking at was Government standard when he asked if it were free from weeds; to which he replied, I find that there is nothing in that Government standard term. I will take a sample and send it to the Seed Branch, and if it turns out all right I will take so much of that seed.

A number of the seed retailers, when weed seeds are pointed out in their samples, say that they are disappointed, and another year the wholesaler who gets his order must give a written guarantee that the seeds he buys will grade No. 1 under the Act, for what he wishes to sell as No. 1, and that the other must be good enough to sell. A few of the large firms seem to be grading some of their brands very close to the maximum number of weed seeds allowed to be sold, viz., 5 to 1,000. This is rather a foolish and dangerous policy.

Some of the English and Chili seeds which have been imported are very large, and make a fine looking sample, but too frequently they are being offered in the trade with too many weed seeds, such as ribgrass, curled dock, fool's parsley, catchfly and dodder, besides a seed which resembles wild mustard very much, except in color and flavor. Most of the farmers have secured their supplies of seeds by this time, but very often they run short and need some to finish out a piece. That is the time to look out for low-grade seeds. The best seeds are usually bought up first by enterprising farmers, while tenant farmers are too frequently satisfied with the cheaper grades, much to the disadvantage of the land owners, who, if they wish to keep their farms clean of noxious weed life, should furnish the small seeds to sow themselves.

On the whole, it may be stated that the seed merchants are conforming to the law pretty well, and the average of the seed for purity is growing better from year to year.

T. G. RAYNOR.

J. A. Ruddick, Dairy and Cold-storage Commissioner, Department of Agriculture, Ottawa, has been appointed Canadian delegate to the third International Congress of the International Dairy Federation, which meets this year in September at the Hague, Holland. He will also attend a health convention in Brussels, at which the relation of dairy supplies to health will be discussed.