

# New York Agricultural Experiment Station.

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OF  
BULLETIN No. 122.

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A PECULIAR INSECT ENEMY OF THE APPLE.

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†Connected with Fertilizer Control.

POPULAR EDITION\*

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BULLETIN NO. 122.

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A PECULIAR INSECT ENEMY OF THE APPLE.

F. H. HALL.

**A hidden  
enemy.**

A new pest has begun its destructive work in the apple orchards of western New York. The insects which cause the ravages are very inconspicuous; for, though they may be present in great numbers and may be doing much damage, the injurious caterpillars, or worms, or larvæ, as they are called by different persons, are seldom seen. Not only are they very small in size and plain in color, but each little worm also surrounds itself with a shell or case into which it can retreat completely and from which it never wholly ventures until it has reached its mature stage.

**Popular  
name.**

This tiny case, never much more than a quarter of an inch in length, is peculiarly curved at one end and, with its long tube like body, much resembles a miniature pistol. This gives the insect its popular and very appropriate name, Pistol-Case-Bearer.

**Where  
found.**

During the fall, winter and early spring these queer little cases, now only about one-eighth of an inch long, may be found by careful search attached by their "muzzles," as it seems, to the twigs of the infected trees and projecting at various angles from the bark. Inside each case is a half grown, dormant caterpillar waiting the advent of spring and the swelling of the buds.

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\* This is a brief review of Bulletin No. 122 of the Station, on The Pistol-Case-Bearer, by V. H. Lowe. Anyone specially interested in the detailed account of the investigations will be furnished, on application, with a copy of the complete bulletin.

**Mode of attack.** With the warm days of April renewed life appears in the cases. Each vigorous little dweller forces its home from its resting place on the bark, projects head and legs and part of its body from the "mouth" of the pistol and crawls toward the nearest bud, bearing the clumsy looking case upon the hinder segments of its ludicrously elevated body. Into the bud the larva pierces, cutting a small round hole through the tough outer tissues and stretching out to the utmost to reach the tender parts upon which it feeds, but never releasing its hold upon the case.

**Injury.** As soon as the leaves unfold and the flowers open they too are attacked, and even the growing fruit is not exempt. So small are the worms that at this early stage they feed within the buds and even between the surfaces of the leaves, so that when the case is removed the only trace of the insect's presence is the tiny hole through which it has thrust its head and body. Soon they become larger and stronger and eat away large patches of the leaf until sometimes nothing is left but the skeleton. The buds they attack are ruined and the opened flowers are often robbed of their essential organs, and of course fail to set fruit. The leaves become riddled with holes, turn brown, die and drop off long before their time; while the fruit itself is sometimes pierced and made ill shapen. Though of such small size and so "retiring" in habit the insects thus strike at the very heart of the promised crop and work irreparable injury.

**Growth of insect and its case.** As the caterpillars grow their cases become too small so they enlarge them by spinning more silk about the mouth of the tubes until these reach a length of about a quarter of an inch. The larvæ themselves are now about one-fifth of an inch in length, are light yellow in color with some dark brown markings, have black legs and black heads each striped down the front with a more or less distinct yellowish line.

**Maturity.** About the middle of May the larvæ are full grown and prepare themselves for another stage of their life history. Again they attach their cases to the bark of the twigs, spin over the opening a network of silk and reverse the direction of their bodies in the cases. Here they assume a dark brown color and change into pupæ or



*Fig. 1*



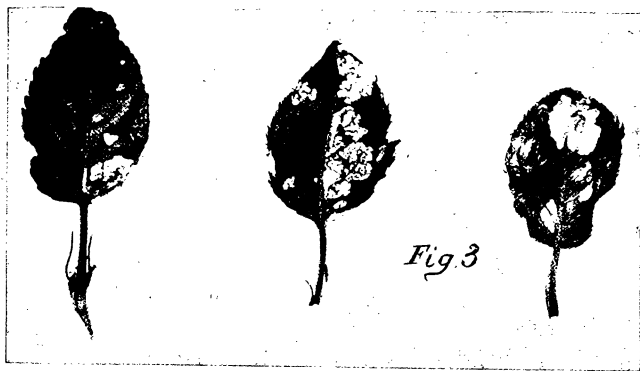
*Fig. 2*



*Fig. 5*



*Fig. 4*



*Fig. 3*

*Winter appearance and early work of Piston-Case-Bearer.*



*Fig. 6*



*Fig. 7*



*Fig. 8*

half grown insects. For about two weeks they remain in this stage, apparently dormant but in reality passing through a wonderful change, and then emerge from a slit-like opening in the "handle" end of the case.

**Adult insects.**

They are no longer caterpillars but beautiful steel gray moths with a wing spread of nearly half an inch. The females are a little larger than the males, somewhat lighter in color and usually bear upon their fore wings near the body numerous white scales. These scales are fewer in number or lacking in the males. The antennæ or "feelers" and the legs are marked with rings of light and dark scales, and feathery tufts appear at the bases of the antennæ.

**Egg laying.**

The moths lay their eggs some time in June, placing them singly on the under surface of the leaves near the midribs and larger veins. These eggs are just visible to the naked eye, are yellowish green in color, like an inverted teacup in form and have parallel ridges and depressions upon the sides and a marked depression at the top. They probably hatch in about two weeks.

**Case forming.**

The minute larvæ immediately begin to work upon the leaves and soon form their cases of spun silk and excrement, rough upon the outside but smooth and shining within. The larvæ attain a length of about an eighth of an inch during the fall and then seek the twigs and fix themselves upon the bark for winter.

**History.**

The insect is not really a new or unknown one, as it did much damage in Erie County, Pa., in 1878 and was shortly afterward described by Dr. C. V. Riley and given its scientific name, *Coleophora malivorella*. It has occasionally been found in different parts of the country in numbers sufficient to attract the attention of writers on economic entomology but has not for many years previous to 1896 been troublesome in New York.

**A similar insect.**

In its attacks the pistol-case-bearer is frequently accompanied by a similar species known as the cigar-case-bearer (*Coleophora fletcherella*), which it somewhat resembles. It is easily distinguished from the latter species, the peculiarly curved, pistol shaped case of

the pistol-case-bearer being less slender and darker in color than the flattened tube of the cigar-case-bearer with its regular half-moon like curve. Both insects work mainly upon the apple, and are quite similar in habits, but the pistol-case-bearer is less of a leaf miner and even in its winter stage occupies more open situations upon the twigs than does the cigar-case-bearer.

As the pistol-case-bearer begins its attack so early **Treatment.** in the spring, its presence must be ascertained during the winter or before the buds begin to swell if effective treatment is to be given. Though small and very inconspicuous because of their bark-like color the little cases may be found upon the young twigs, close to the buds or upon them. If detected preparation should be made to give, as soon as warm days promise swelling of the buds, a thorough application of Paris green, 1 pound to 150 gallons of water, so that the first meal of the little case-bearers may be a poisoned one. In experiments made by the Station Paris green of the strength indicated, applied three times, April 20, May 1 and May 6, proved very effective; the sprayed trees at the time of the last treatment appeared nearly free from the case-bearers while unsprayed trees in the same orchard showed plain signs of injury.

The larvæ are so thoroughly protected in the cases that kerosene emulsion, in any strength safe to use upon foliage, appears to have little effect.

It is possible that parasitic enemies, other insects **Natural** which deposit their eggs in the bodies of the **enemies.** young larvæ, may lessen the numbers of the case-bearer as such parasites of three different species were reared from specimens of the insect kept in the Station laboratory.

The pistol-case-bearer may disappear as suddenly **Conclusion.** as it appeared, or it may spread and become a regular dweller upon our apple trees and require constant attention. It behooves the grower then to examine carefully the twigs of his trees and to take immediate and active measures for the repression of the pest if it appears. If it is not present, observe carefully the nursery stock introduced, and see that this is not affected, for it is in this way that the insect is



most liable to be introduced into sections where it is not now found.

If these precautions are fully and carefully observed great damage by the pistol-case-bearer is not to be feared.