

coons are formed in protected places, and the yellowish-brown moths appear a week or so later to deposit bracelets of varnished eggs on the twigs. There is but one brood each season.

*Treatment.* Collect egg clusters in fall and winter; spray the young caterpillars with arsenic solution; burn or otherwise destroy the tents.

4. THE CIGAR CASE-BEARER (*Coleophora fletcherella*). Small cigar-shaped bodies may often be seen attached to the bark and leaves. These are the cases of tiny caterpillars which feed on the buds and leaves. In spring these caterpillars often do much harm. In late June or July the small moths appear to lay their eggs. When first hatched the caterpillars are leaf-miners, but later become case-bearers. They pass the winter in their cases, as half grown caterpillars.

*Treatment.* Spray thoroughly with arsenic solutions just as buds are opening and repeat if necessary a week later.

5. THE PISTOL CASE-BEARER (*Coleophora malivorella*). This Case-bearer is readily recognized by the pistol-shaped case which is attached to the branches. The small dark-colored moths appear at the end of June and deposit egg. The caterpillars hatch from the eggs in July, and eat holes in the leaves. They make cases for themselves as they feed. They spend the winter in the cases attached to the twigs. In early spring they recommence feeding on the opening buds and flowers. About the first of June they change to pupae, and the moths emerge two or three weeks later.

*Treatment.* Spray with arsenic solution as the buds are opening, and again a week later.

6. THE APPLE PLANT-LICE (*Aphis pomi et al*). These green plant-lice curl the leaves badly, and injure the buds. They are sucking insects and they secrete a sweet sticky liquid called honey-dew. They winter over as black, shining eggs on the branches of twigs. It is likely that there are more than one species. There are both winged and wingless forms during the summer.

*Treatment.* Spray when young plant-lice first appear with kerosene emulsion solution or any other good contact insecticide; spray with sulphur salt wash in early spring.

Several other insects are occasionally found injuring the leaves, viz., the APPLE-LEAF MINER, which mines within the leaf, and forms its pupa within the folded leaf; the APPLE-LEAF BUCCULATRIX, which forms white ribbed cocoons in clusters on the branches, while the caterpillars feed on the leaves; the PALMER WORM, a small yellowish green caterpillar, often numerous in June and July, when it injures the fruit as well as the leaves; the APPLE-LEAF TYER, which folds the leaf and lives within, feeding on the soft tissues; the APPLE-LEAF ROLLER, which feeds within folded leaves; the RED-HUMPED CATERPILLAR and the YELLOW-NECKED CATERPILLAR, which cluster on limbs and eat the leaves.

*Treatment.* As a rule spraying with arsenic solution at intervals during the season will control these.