

They winter here. If an infested cane is cut through the darkened pith shows clearly the work of the borers. There is only one brood each year.

Means of Control.—It is impossible to do anything against this pest by spraying, and the only practicable means of control seems to be not to grow currants in tree, but in bush form, and to practise a system of pruning by which the wood is not allowed to become old, but is removed after bearing one or at the most two crops, and new shoots allowed to grow up to take their place. All prunings must be burned before the end of May, or the moths will emerge from them. Any dying or sickly canes should also be promptly removed throughout the season and either burned or the borers inside them killed.

THE CURRANT APHIS (*Myzus ribis*).—The leaves of currants and, to a lesser extent, of gooseberries are often severely attacked by green plant lice, aphids, which feed upon the under surface and cause the leaves to curl downwards. The parts



FIG. 21.—Imported Currant Borer; moth, larva and empty pupae case still attached to exit hole. The dark hole in the end of the cane shows where the larva has tunneled in the pith. (After Lugger.)

of the upper surface between the veins are usually elevated in large irregular blisters that are often reddish in color. Affected leaves in many cases are so much weakened that they die. The aphids pass the winter in the egg stage. Eggs are very small, black and glossy and are placed in the axils of the buds and the wood. They hatch a few days before the buds burst and the young aphids at once proceed to feed upon the developing buds and leaves. Reproduction in early summer is very rapid, and enormous numbers of the insects may be found. Natural enemies, however, both parasitic and predaceous, usually bring them under control in midsummer.

Means of control.—Arsenical mixtures are useless as aphids are sucking insects; hence contact poisons must be applied. Of these probably the best is Black Leaf 40, a tobacco extract. The only objection to this is that it is somewhat expensive. It should be used with lime-sulphur as soon as the eggs have hatched, that is, a day or two before the buds burst. This will destroy most of the insects and, if another application combined with the lime-sulphur or Bordeaux mixture is given just before the blossoms come out, almost every aphid can be destroyed. Of course, in the latter case the spray must be shot up from beneath so that the under surfaces may be covered. The lime-sulphur or Bordeaux is added with the object of controlling diseases (see under Leaf-spot above). Kerosene Emulsion or Whaleoil Soap, 1