

best remedy for them is a mash of poisoned bran made by slightly moistening 25 pounds with water in which some sugar has been dissolved, and then adding 4 ounces of Paris green; the poison should be gradually dusted on the top and stirred all the time, otherwise it will sink through the bran at once and be ineffective. If bran cannot be obtained, flour may be used instead. A handful or two of the mash should be placed at the base of each vine. When the caterpillars come out they will eat this mixture in preference to anything else and then return to their hiding-places to die.

Many other caterpillars, great and small, feed upon the foliage of the grape, and may from time to time become destructive. Spraying with Paris green will get rid of them whenever they appear to be dangerous.

THE GRAPE LEAF-HOPPER (*Typhlocyba vitifex*). This insect is commonly, but erroneously, called "Thrips." It is a minute creature, about one-eighth of an inch in length, and is to be found in great numbers on the under side of the leaves. When disturbed it hops with great agility and quickly takes flight. When seen under a magnifying glass these insects are found to be prettily marked with different colors, red, yellow, etc., and are believed to represent several species. The larvæ appear in June and resemble the adults, except that they are smaller and wingless; they moult several times and the empty cast-off skins may often be found in great numbers sticking to the leaves. These insects belong to the order of true "bugs," and are furnished with beaks for sucking the juices of the plants, not with jaws for biting; consequently they cannot be poisoned through their food, but must be treated with contact remedies such as strong tobacco water, whale-oil soap or kerosene emulsion. Their presence is usually made known by the blotches they produce on the leaves from the exhaustion of the sap; and as they occur in immense numbers they often destroy the whole leaf, causing it to look as if scorched, and to drop from the vine. In winter the adults take refuge under leaves and rubbish, and may be destroyed, with several other of the insects here referred to, by raking up and burning all such material in the autumn.

THE GRAPE PHYLLOXERA (*Phylloxera vastatrix*), Fig. 60. In the wine-producing countries of Europe no insect has a more evil reputation or is more dreaded than this native American species, which has caused enormous losses to the vine-growers and almost destroyed the chief industry of many large districts in France, Spain, Portugal and other countries. Volumes have been written describing its history, habits, distribution and the remedies that have been tried for its control. Millions of dollars would not cover the losses it has entailed. Now, happily, it has ceased to be a serious pest, though it has by no means been exterminated. Relief was obtained in Europe by grafting their own varieties on American stocks which are able to resist the attacks of this insidious foe.