

every symptom of inquietude and anger. Sometimes, to rescue them from their rivals, they take their Aphides in their mouth; they generally keep guard round them, and when the branch is conveniently situated, they have recourse to an expedient still more effectual to keep off interlopers. They inclose it in a tube of earth or other material, and thus confine them in a kind of paddock near their nest, and often communicating with it."

Another curious and noteworthy fact in the history of Aphides is their occasional migration from one place to another in enormous swarms. Nearly a century ago Gilbert White observed at Selborne, in Hampshire, a shower of Aphides, which covered persons walking in the street, hedges, garden plants, and everything else that came in their way; he considered that they were borne by the east wind from the great hop fields of Kent and Sussex. Kirby and Spence mention similar swarms in the vicinity of Ipswich in 1814, and at Hull in 1836. To come to later times, Mr. Knaggs relates (*Entomologists' Monthly Magazine*, No. 5, p. 123) that on the 14th of July, 1864, "whilst walking along the beach from Bournemouth towards Poole, a strange mossy-looking, green track, which varied in width from one to three or four inches, arrested my attention; this moss-like line, left at high-water mark by the tide, extended, so far as my observation went, for a mile, though probably to a far greater length, and consisted of millions upon millions of Aphides." The following year, it is stated by Mr. Haswell (*Ent. Mag.*, No. 18, p. 142) that the Aphides were a perfect pest in Edinburgh and other parts of Scotland in September and October; they swarmed over everything even in the streets of cities, and to such an extent that "they rendered one very uncomfortable by their numbers, especially when they got into one's mouth or eyes!"

The numbers and devastating powers of the Hop Aphis being so great, it becomes necessary oftentimes to apply some artificial remedy in order to save the crop from entire destruction. In parts of England where the labour of women and children can be obtained at a cheap rate, it has been recommended to clear the plants of insects by hand; but any such mode of dealing with them is quite out of the question in Canada. We must then have recourse to some other expedients. The following we believe to be the most efficacious:

(1.) Make a mixture of strong soap-suds; add to it salt and saltpetre till a brine is made about half as strong as ordinary beef pickle; add further a pound of copperas dissolved in warm water to every five gallons of liquid. Or

(2.) Make a strong decoction of tobacco by boiling at the rate of a pound of stems and refuse parts, or other cheap tobacco, to a gallon of water.

As soon as the insects are observed on the vines (or *bines*, as hop-growers term them,) they may be at once detected by the discolouration that we have referred to above. Go through the rows with a supply of either of these mixtures, and sprinkle them thoroughly with it. As the insects are for the most part congregated on the under side of the leaves, it is necessary to use a strong syringe, or better, a small garden engine with a rose-nozzle attached, and squirt the liquid upon the insects from beneath. Constant watchfulness and a diligent application of these means will keep a hop-yard clear of these insects, without incurring any very great expense. The modern system of training the vines upon horizontal trellises, instead of long poles, renders easy the successful employment of this method.

Another remedy that has been highly spoken of is the dusting of the affected plants with powdered plaster, which not only kills the Aphis, but is of benefit to the soil as well. Instead of plaster, sulphur, or lime may be employed with advantage, the former being especially useful also as a preventative for mildew.

In addition to the use of the artificial remedies just referred to, much benefit may be derived from the encouragement of various insects that prey almost exclusively upon the various species of Aphis. As we have before stated, when giving an account of the enemies of the Grain Plant Louse (*2nd Report*, p. 58), "the most common and useful are the different species of Lady-birds (Fig. 18); the Lace-wing Flies (*Chrysopa*), both in their perfect state (Fig. 19), and in their larval condition (Fig. 20);



FIG. 18.