

leaves (seven hundred hills, each with two poles and two vines) to an acre of hops, as grown in the United States, will not, on the average, much exceed a million before the period of blooming or burning; so that the issue from a single stem-mother may, under favouring circumstances, blight hundreds of acres in the course of two or three months.\*

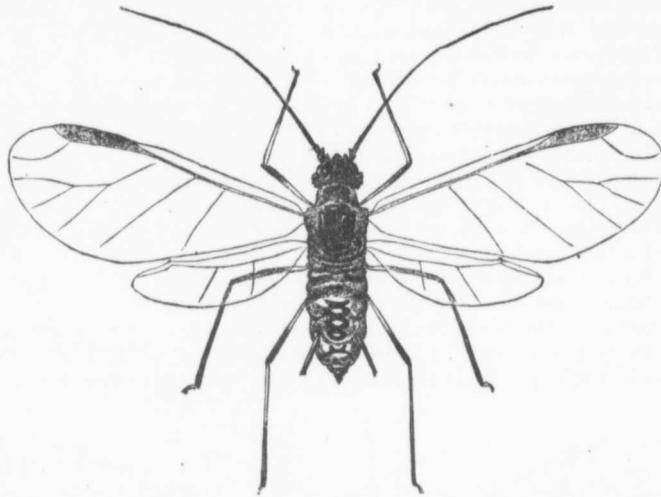


FIG. 38.

Winged male enlarged.

The foregoing account of the life-history of the Hop Aphis is so wonderful and interesting that we feel sure the readers of our reports will be glad to have it brought before them. It is also of great value, as it enables hop growers now to apply remedies and use methods of prevention that could not have been devised when the true habits of the insect were unknown.

The first and most obvious preventive measure is the destruction of the Aphis on the plum trees in early spring before they have migrated to the hop. This can be done by syringing the trees with a strong tobacco or soap wash, or more effectively still, by using a weak kerosene emulsion. Receipts for making this were given in our report for 1886, but for convenience sake we quote a simple method recommended by



FIG. 39.

Eggs and shrivelled skin of female which laid them, enlarged.

Professor A. J. Cook, of the Agricultural College of Michigan; he says: "I have found nothing so satisfactory in treating plant-lice as the kerosene and soap mixture. To make this I use one-fourth of a pound of hard soap, preferably whale-oil soap, and one quart of water. This is heated till the soap is dissolved, when one pint of kerosene oil is added, and the whole agitated till a permanent emulsion or mixture is formed. The agitation is easily secured by the use of a force pump, pumping the liquid with force into the vessel holding it. I then add water so that there shall be kerosene in the proportion of 1 to 15." This mixture has been found

\* We have to thank Dr. Riley for his kindness in permitting us to use the above illustrations of the Hop-Aphis. They were originally drawn by him to illustrate his paper on the subject in "Insect Life," vol. i., pp. 133-136.

Another method, on a large scale, is the immediate neig from the insects,

When the should be at onment this pest c delay, otherwise i its destruction v

This inapor States, and often larva, or maggot destroys it, partl

The accomp below showing t and below it th right exhibits th of the onion bull in the season on close to the surf the young maggo trate downwards of the bulb. So found together; colour, tapering i destitute of legs. erally lie just ou mud, which is ke of the injured p fortnight, and th brown pupæ, of a flies emerge in a at once lay their the bulb, the fly close of the seaso winged flies come Such, in brief, is

The best met modes of doing tl is to bury the bul done by earthing deposit their eggs if this is well cov ground, and the place, and conseq growing onions i gradually drawing bulb always cover of the insect.

The second n will be sufficiently For this purpose over the bed abou thickly, as it is e