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ENTOMOLOGY FOR BEGINNERS.

*PULVINARIA INNUMERABILIS*, RATHVON.

BY THE EDITOR.

This insect, which has commonly been known as the Grape-vine Bark-louse, might with perhaps greater propriety be now designated the Maple-tree Bark-louse, for the reason that it has been more frequently found on maples, and inflicted more injury on these trees, than it has on grape vines. The great abundance of this insect during the past season has called general attention to it and elicited many enquiries in reference to its history and habits; indeed, in many sections of Western Ontario, as well as in the adjoining States of Michigan and New York, it has appeared in such swarms as to endanger the lives of the trees attacked. Branches have been sent to us so thickly covered with the insect in its various stages of growth that they could not be handled without crushing some of the numerous population.

The earliest description of this insect was given by Dr. S. S. Rathvon, of Lancaster, Pa., in 1854, who at that time gave the results of several years' observation on this species, which had occurred in his neighborhood on the Basswood or American Linden trees (*Tilia americana*). He found them to swarm in such countless hosts that he gave the insect the significant name of *innumerabilis*. The late Dr. Fitch next published an account of it in the Transactions of the N. Y. State Agricultural Society for 1859, since which several authors have figured and described this insect; but its life history was not fully unfolded until taken in hand by the late lamented J. D. Putnam, of Davenport, Iowa, who published in 1879, in the Report of the Davenport Academy of Sciences, a most elaborate and complete description of its life history, illustrated with two plates crowded with figures representing the various stages of development, all drawn by himself from nature. To these several publications we are mainly indebted for the facts here presented.

This bark-louse appears first in the form of a brown scale, from which, as it increases in size, there is protruded from the female scale cylindrical white filaments of a waxy nature, in which eggs are laid, and these cotton-like filaments, as new fibres are secreted, are constantly pushed further



Fig. 5.

back until there protrudes a bunch about four times as large as the scale, as shown in fig. 5, which is thickly crowded with eggs. Permeating through the nest is a quantity of powdery matter which under a high magnifying power is seen to be in the form of rings. The waxy filaments are adhesive and elastic, and can be pulled out sometimes a foot or more before entirely separating. When heat is applied these fibres melt, and their waxy nature is further demonstrated by their solubility in ether and chloroform. A single nest will seldom contain less than 500 eggs, and sometimes upwards of 2,000. The female begins to lay eggs in the latter part of May, and continues laying from five to seven weeks, until she dies from exhaustion, her entire life continuing for about thirteen months. During the laying and hatching of the eggs she secretes a quantity of a sweet liquid known as honey-dew, which attracts ants, flies and

other insects, and it often happens that the young lice crawl up the legs and bodies of these visitors, by whom they are thus carried to other trees.

The newly hatched, yellowish-white lice soon distribute themselves over the branches, and attaching to the succulent portions, pierce the tender bark with their sharp beaks and subsist upon the sap. They shortly become stationary, when they gradually increase in size and finally reach maturity.

The scale of the male insect is very different from the female. It is longer in proportion to its size, and there are no waxy filaments projecting from it. When fully mature the insect escapes from its scaly covering and appears as a minute, beautiful and delicately formed two-winged fly, marked with yellowish and chestnut brown, with brilliant rose-colored wings which also reflect the colors of the rainbow. These flies do not appear until August and September, and their lives in the winged state are very short, not exceeding two or three days.

Besides the Maple and the Grape, these insects are, as already stated, also found on the Linden or Basswood, and sometimes on the Elm.

Where permitted to continue their depredations undisturbed, they weaken and injure, and occasionally destroy the trees attacked. They affect chiefly the under side of the branches and twigs.

#### REMEDIES.

The branches of the infested trees may be vigorously rubbed with a stiff brush or broom, which will dislodge many of the insects, and then coated with a strong alkaline wash made by melting either soft or hard soap and diluting it to the consistence of paint with a strong solution of washing soda ; or they may be destroyed with an emulsion of coal oil made by agitating vigorously and for a considerable time one pint of coal oil with an equal quantity of milk, until the mixture assumes a creamy appearance, when it should be diluted with about ten times its bulk of water and applied with a brush or syringe.

#### DESCRIPTION OF THE LARVA OF HEMARIS TENUIS, GR.

BY PH. FISCHER, BUFFALO, N. Y.

Head light green, around which is a ring of bright fine yellow granulations. Body light green whitish at the dorsal region; a whitish subdorsal line on each side running from caudal horn to third segment, also a dorsal green line running from caudal horn to 3rd segment, where they both become indistinct. Under side and legs chocolate brown, prolegs black, with a narrow white band near base. Caudal horn thin, slightly curved forward, flanked at base with bright yellow. Stigmata on first, and from third to tenth segments, dark blue. Length about two inches. Larva finely granulated with white. It is found from middle of June to end of July. Of these, some of the earliest larvæ will, after pupating, hatch within about two weeks, (the balance staying over till next spring) which will deposit their eggs and also grow to maturity towards the latter part of September ; so that the larvæ may be found almost continually from June to October. The eggs are small, round and green, and hatch in about ten days ; they are found on the under side of the leaves of *Symphoricarpus*, *Lonicera* (different species), and *Triosteum perfoliatum*, its food plants. The color of the larvæ of this latter brood varies considerably, some being a reddish brown with a slight purple tint, the head sometimes being yellow like the ring around it, sometimes brown ; others when young are green above and black below, with a black head ; others again have the normal color and other characteristics.