

No part of a plant seems to be exempt from their attacks; driving their sharp beaks through the epidermis, they suck the sap from the leaves, the young twigs, the roots, and even the rough bark of the stem. A good representation of a too common species, *A. mali*, the apple blight, is given at Fig. 90, and illustrates the structure of most of these insects; we have the winged male of the natural size and the same with the female magnified. The best remedy for all the small insects which affect the bark and foliage of trees, is undoubtedly a frequent application of a solution of whale oil soap thrown on to the foliage by means of a syringe. The bark-lice which swarm on apple-trees in the autumn may be easily cleaned off by means of a thorough scrubbing with soap-suds; the addition of flour of sulphur to this mixture will prevent fungoid diseases making way where the Aphides have injured the bark. Many of the species make galls on different plants as on the poplar. The injuries done by these minute flies, I have said, is very great. Kirby and Spence state that the damage done to hops alone in England often made as much difference as £200,000 in the duty on hops in one year. I have myself occasionally seen in the south of England, what gave promise of being a splendid crop of hops, rendered worthless by a species of *Aphis*, in the short period of about a fortnight. It is to this family that the dreaded *Phylloxera* belongs which has absolutely rendered the cultivation of the vine impossible in some parts of France, and I know from personal information that a large grape-grower in one of the best champagne districts in that country had, in 1880, on account of this insect, simply to give up vine-growing, grub up his vineyards, and burn the vines.

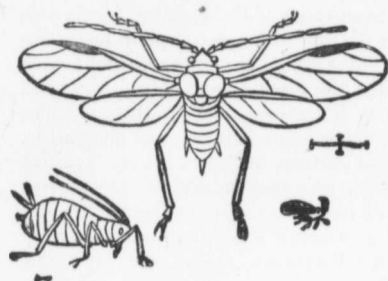


Fig. 90.

Our President has so ably described this insect in its different forms in several papers during the past year or two that further reference to it is unnecessary. In the last division, Monomera, which have only one joint in the tarsus, we find those extraordinary insects the Coccidæ, or Scale insects, as they are called, on account of the peculiar shape of the females, which in different species take different forms; some are oval and more or less convex, some shaped like a boat turned bottom upwards, some kidney shaped or globular; and one of the best known, the oyster-shell bark louse, takes the shape its name implies. Westwood remarks truly: "These form one of the most anomalous tribes of insects with which we are acquainted, and which already prove that annulose animals may exist, which become more and more imperfect as they approach the winged state, and which in that state lose all trace of articulation in the body as well as of articulated limbs (as in the female Cocco), leaving, in fact, inert and fixed masses of animal matter, motionless and apparently senseless, and which resemble nothing more nearly than the vegetable excrescences called galls."

The females undergo only a partial transformation, and never possess wings; the males on the other hand have a complete metamorphosis, with a quiescent pupal state, in which the rudiments of the antennæ, wings, etc., are perceptible, and have the legs arranged on the breast with the anterior pair directed forwards, a peculiarity not occurring in any other insects. The mature female retains the beak, but does not acquire wings, and the male has two wings, but the mouth parts disappear.

The eggs are hatched beneath the protecting scale, which was formerly the mother's body; they soon make their escape, as active little six-footed grubs, with slender beaks and two long bristles at the end of the body; and in some species, as *C. adonidum*, the Mealy Bug of the greenhouse, are covered with a white powdery covering. Most species, however, are naked. At this stage both sexes are alike.

As soon as they leave the scale they move along the branches towards the tip, and fix their beaks in the bark of the twig. From this time they remain motionless, fastened to the epidermis of the plant by means of small white downy threads emitted from the undersides of their bodies, they lose the caudal bristles, a scale forms over them, and they increase rapidly in size.

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