

orchards and apple plantations where the trees have been unpruned and neglected; and its action is most injurious. Young trees planted in infested orchards and plantations are frequently so injured by the wholly aphides carried to them by the wind, and by the winged females, that they die. Their bark, being tender, is easily pierced by the sharp beaks of the larvae, and they cannot long withstand these attacks.

Apple growers often notice bunches of a woolly or cottony substance on the stems, branches, and twigs of apple trees, especially upon scars and cracks where the bark has been injured, or where side shoots and branches have been cut off in an unworkmanlike manner, so that wet has collected and caused decay; the fissures have been formed which have increased in depth and width; while the outer layers of bark do not join, and a thin tissue covers the exposed parts. Upon close and careful examination, the white substance on these will be found to consist of little groups of aphides in various stages, some of which are clothed with fine woolly coverings, and are actively engaged in piercing these naked surfaces with their suckers, and in feeding upon the sap, thus preventing a healthy growth of tissue. Stoppage of the flow of sap also occurs, giving rise to excrescences or warty growths, which afford food and shelter for the numerous generations of larvae; and, eventually, the whole branch is affected, and its vigour and fruitfulness seriously impaired. The infestation spreads rapidly to other parts of the tree, and the smaller branches and fruit-bearing spurs are in time attacked; these, as shown in fig. 3, are soon destroyed by the action of the aphides, and if not interrupted in their destructive work, the tree soon dies, or becomes useless.

The effect of this attack is sometimes attributed to "canker," but it is altogether different; and a careful inspection will show that the woolly aphis is the sole cause of the mischief. The orchardist who neglects his trees is a bad neighbour, for the aphis spreads from branch to

branch, from tree to tree, and from orchard to orchard, if unheeded and unchecked; is protected by lichens and mosses, if they are allowed to remain on the trunks of the trees, and by the thick interlacement of boughs and branches where pruning has been neglected. The woolly aphis is sometimes found upon plums and even upon the elm: It also injures the roots of apple-trees and causes swellings upon them. Some have supposed that the insects descend into the ground only for protection from the cold, but it has been well proved that they also feed upon the roots. The aphis under consideration is quite distinct from another species found upon apple trees, known as "*Aphis mali*," which lives upon the leaves and blossoms.

The winged female (fig. 1) brings forth living larvae. Towards the end of the summer, among the larvae produced by the winged females are wingless, egg-bearing females without beaks, and therefore unable to feed. Only one very small, round, transparent egg is laid by each of these wingless females, and is deposited in crevices of the bark.

The regular continuity of existence is carried on by the larvae which pass the winter wrapped in their woolly coats upon the trunks, branches and twigs, or roots of the trees. The wingless females are not beauties, they are brown and in shape broad, squat, and uncanny, see fig. 2, the larvae from these, after a time, emit wreaths of woolly material and become completely covered, so that a group of them has the appearance of a piece of cotton-wool (fig. 2). A very curious part of them is their enormously long beak, which is bent underneath the body and extending much beyond its extremity, which when seen without a microscope makes them look as if they had tails.

Methods of prevention and remedies.

Keep trees free from moss or lichens. Moss and lichens can be killed by throwing finely powdered lime over the trees during the winter in damp weather. This can be