

whole tree, if allowed to remain, or if, originally, very extensive.

The remedy for the insect blight is very distinct. It is that originally suggested by Mr. Lowell, which we and many others have pursued with entire success, when the other form of the disease was not also present. This remedy consists, at the very first indications of the existence of the enemy, in cutting off and burning the diseased branch, a foot below the lowest mark of discoloration. The insect is usually to be found at the bottom of this blackened point, and it is very important that the branches be removed early, as the *Scolytus* is now about emerging from his burrow, and will speedily escape us, to multiply the mischief elsewhere. If there is much appearance of the insect blight, the tree should be examined every noon, so long as there are any indications of disease, and the imputed branches carried at once to the fire.

If. THE FROZEN SAP BLIGHT. We give this term to the most formidable phase of this disease that affects the pear tree. Though it is, by ordinary observers, often confounded in its effects with the insect blight, yet it has strongly characteristic marks, and is far more fatal in its effects.

The symptoms of the frozen sap blight are the following. First; the appearance, at the season of winter or spring pruning, of a thick, clammy sap, of a sticky nature, which exudes from the wounds made by the knife; the ordinary cut showing a clean and smooth surface.

Second; the appearance, in the spring, on the back of the trunk or branches, often a considerable distance from the extremities, of black, shrivelled, dead, patches of bark.

Third; in early summer months, the disease fully manifests itself by the extremities shrivelling, turning black, and decaying, as if suddenly killed. If these diseased parts are cut off, the inner bark and heart-wood will be found dark and discoloured some distance below where it is fresh and green outside. If the tree is slightly affected only, it may pass off with the loss of a few branches, but if it has been seriously tainted, the disease, if not arrested, may, sooner or later, be carried through the whole system of the tree, which will gradually decline, or entirely perish.

To explain the nature of the disease, we must first premise that, in every tree, there are two currents of sap, which rises through the outer wood, (or *alburnum*.) to be digested by the leaves; 2nd, the downward current, which descends through the inner bark, (or *liber*.) forming a deposit of new wood on its passage down.

Now let us suppose, anterior to a blight season, a very sudden and early winter, succeeding a damp and warm autumn. The summer having been dry, the growth of trees was completed early, but this excess of dampness in autumn, forces the trees into a vigorous second growth, which continues late. While the sap vessels are

still filled with their fluids, a sharp and sudden freezing takes place, or is, perhaps, repeated several times, followed, in the day time, by bright sun. The descending current of sap becomes thick and clammy, so as to descend with difficulty; it chokes up the sap-vessels, freezes and thaws again, loses its vitality, and becomes dark and discoloured, and, in some cases, poisonous, as to destroy the leaves of other plants which applied to them. Here, along the inner bark, it lodges, and remains in a thick, sticky state, all winter. If it happens to flow down till it meets with any obstruction, and remains in any considerable quantity, it freezes again beneath the bark, ruptures and destroys the sap-vessels, and the bark and some of the wood beneath it shrivells and dies.

In the ensuing spring, the upward current of sap rises through its ordinary channel—the outer wood or *alburnum*—the leaves expand, and, for some time, nearly all the upward current being taken up to form leaves and new shoots, the tree appears flourishing. Toward the beginning of summer, however, the leaves commence sending the downward current of sap to increase the woody matter of the stem. This current, it will be remembered, has to pass downward, through the inner bark, or *liber*, along which, still remain portions of the poisonous sap, arrested in its course the previous autumn. This poison is diluted and taken up, by the new downward current, distributed toward the pith, and along the new layers of *alburnum*, thus tainting all the neighboring parts. Should any of the adjacent sap-vessels have been ruptured by frost, so that the poison thus becomes mixed with the still ascending current of sap, the branch above it immediately turns black and dies, precisely as if poison were introduced under the bark. And very frequently it is accompanied with precisely the odour of decaying and bitter vegetation.

The foregoing is the worst form of disease, and it takes place when the poisoned sap, stagnated under the bark in spots, remains through the winter in a thick semi-fluid state, so as to be capable of being taken up in the descending current of the next summer. When, on the other hand it collects in sufficient quantity to freeze again, burst the sap vessels, and afterwards dry out by the influence of the sun and wind, it leaves the patches of dead bark which we have already described. As part of the woody channels which convey the ascending sap probably remain entire and uninjured, the tree or branch will perhaps continue to grow the whole season and bear fruit, as if nothing had happened to it, drying down to the shrivelled spot of bark the next spring. The effect in this case, is precisely that of girdling only, and the branch or tree will die after a time, but not suddenly.

From what we have said, it is easy to infer that it would not be difficult on the occurrence of such an autumn—when sudden congelation takes place in unripened wood—to predict