THE CARE OF SHADE TREES-III.

FUNGOUS DISEASES.

T is a matter of common observation that fungi play a very important part in the life of many trees, and frequently the most serious disturbances of their vital processes are brought about by the action of these lowly organized plants. It must not be suppose, however, that all the fungi, living in vital connection with trees, are harmful, for recent studies show that many of our common



FIG. 1770. Agaricus melleus (Tree Root-Rot).
A group of plants clustered at the base of a tree, and showing the cap, stalk and gills.
The spores are set free from the edges of the gills. (After Massec).

trees, such as pine, spruce, tamarack, beech, oak, hazel, hornbeam and birch, have their fine rootlets covered with a sheath of fungous threads by means of which the feeding processes are accomplished. These fungous threads, or mycelium, take the place of the root-hairs of ordinary plants, and absorb the food materials from the soil. There are other examples of the fungi and roots living in intimate vital connection, and for their mutual welfare. Most of the members of the heath family, most of the perennial plants living in meadows on peaty and humous soils, and the members of the legume family, have fungi living symbiotically with the roots.

Inasmuch as fungi are incapable of manufacturing plant-food out of inorganic foodmaterials, and must feed upon the already prepared food in the decaying vegetable matter of the soil, it becomes highly necessary that the supply of humus be maintained in the form of litter and forest mould in our parks and woods.

The fungi affecting shade trees may, very conveniently, be divided into three classes, according to the parts of the trees they affect: 1. Fungi affecting the roots and base of trunk; 2. Fungi affecting the stems; and 3. Fungi affecting the leaves.

1. Fungi affecting the Roots and Base of Trunk. The entrance of fungi into the roots of trees is determined to a large extent by the conditions of situation and climate. Where the tree has been weakened by any of the physiological causes discussed in the February number of this magazine, the roots are unable to prevent the development of those fungi which find an entrance into the tissues.

(a) *Tree Root-Rot.* (*Agaricus melleus*). This destructive toad-stool is a very common fungus, not only on all kinds of fruit trees, but also on the forest trees, shade trees and conifers. The cap of the toad-stool, when full grown, is two inches across, and has a honey color. The stalk is often four inches high, and the gills and spores are white. (Fig. 1770.)

The spores are distributed by the wind chiefly. On germination delicate, cob-weblike threads are produced, which soon form a blackish covering on the roots. The roots