tract, may destroy younger brood than the former. It is often found in other parts, and is certainly the cause of the dark masses of rotten brood. Both germs are found in the same comb, and often in the same bee, thus insuring a mixed infection.

Symptoms and Course—Brood is usually attacked late in the larval life, and dies during pupation, or later when nearly mature and ready to come forth through the chrysalis caping. Even after leaving the cell they are so feeble that they fall from the combs helpless. Most of the brood dies after it is sealed. In this it is much like pickled brood, except that as much or more brood dies in the late larval stage than in the pupa. In foul brood, while brood of all ages dies, yet more dies "at the ages of 6, 7, 8, and 9 days than at any other age" (author's Foul Brood, p. 46), even before the rich chyle-like food mixed with pollen is given, which is such a necessary environment for pickled brood and black brood.

When the larvæ show the first signs of this disease, there appears a brownish spot on the body, about the size of a pinhead. The larvæ may yet receive nourishment for a day or two; but as the fermentation increases the brownish spot enlarges, the larvæ dies, stands out, swollen and sharp at the ends. In this they are like pickled brood, except that the brown spot is not present in pickled brood, but pickled brood sometimes becomes brown after death. Foul brood turns brown only after the action of putrefactive germs have brought about decomposition. No decomposition from putrefactive germs takes place in pickled brood. In black brood the dark and rotten masses, in time, break down and settle to the lower side of the cell, as a watery, syrupy, granular liquid—not the sticky, ropy, balsam or glue like semi-fluid substance of foul brood. It does not adhere to the cell walls like that of foul brood; has not the characteristic foul odor which attracts carrion-flies, but a sour, rotten apple smell, and not even a house-fly will set her foot upon it. Cappings in foul brood are sunken in the center when broken, sometimes puffed out by internal gases. In black brood the cap is disturbed from without, sometimes uncapped, and cell contents removed by the bees; not so in foul brood. The cap in pickled brood is usually undisturbed. The decayed brood masses do not adhere to the cell walls like either of the others.

During a good honey-flow, of a few weeks' duration, if the colonies are strong, black brood and pickled brood entirely disappear so far as appearances go; and even in foul brood, colonies seem for the time to improve. The most common cause for this apparent improvement are that in black brood and foul brood the old foul combs are filled with honey instead of brood; and eggs are laid in cells hitherto not used for brood, and in new combs when comb building is going on; or where comb foundation is used, the queen takes advantage of this and deposits her eggs before the cells are drawn out and filled with honey. Again, proportionately, there is less brood-rearing and more comb-building during a heavy honey-flow in strong colonies than in weak ones. In weaker colonies these diseases do not disappear, as more brood is reared and less comb is built, in proportion to the mature bees, than in strong ones. In pickled brood the infection is in bad pollen; nice new pollen always causes it to disappear. Why these diseases should recur when there is a dearth of honey in the field, would be of interest to many.

In strong colonies, as we have seen, proportionately less brood was reared