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# AMERICAN FOUL-BROOD IN BEES AND ITS TREATMENT.

Revised by

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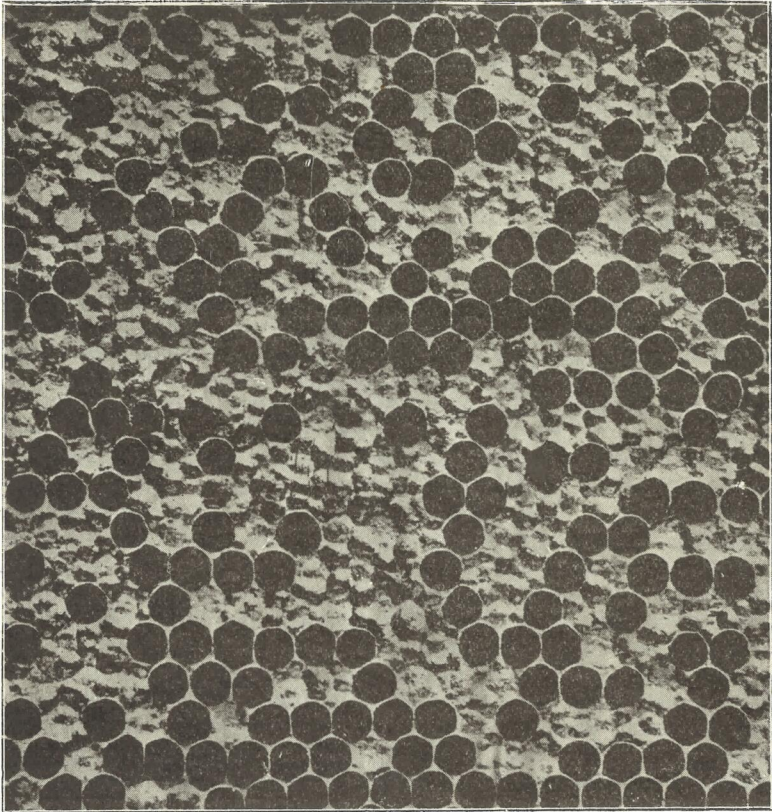


FIG. 1. PORTION OF COMB INFECTED WITH FOUL-BROOD. NATURAL SIZE.

Foul-brood is usually brought into the hive in the honey obtained from a previously infected source. The spore or bacillus finds its way into the alimentary canal of the larvæ along with the food or chyle, and at once begins to increase at an enormous rate until all the available nutriment for its development is used up. The larva in the early stages of the disease assumes an unnatural position. The colour also changes from a pearly-white to a dirty-yellow, and eventually to a dark-brown, sticky, putrid mass. During these stages the smell is usually of an objectionable character, resembling very closely the odour given off by hot glue. In cases where the larva has died after being capped over, the cappings are an indication of the disease contained in the cell. They will be found to be sunken or concave, dark in colour, greasy in appearance, and in some instances perforated. This, however, is not always the case. The cappings over the cells containing healthy brood are usually convex. A good queen lays her eggs in circles, and the fact of a single cell remaining unhatched is suspicious. If allowed to take its course the disease spreads rapidly to surrounding cells and combs, till finally no brood can hatch and the colony succumbs. On opening some of the cells a thin gluc-like

coffee coloured mass will be noticed, which on the insertion of a splinter of wood adheres to the point, and can be drawn rope-like for some little distance out of the cells. This is one of the most distinctive features of foul-brood prevalent in many countries, and, where present, it is considered conclusive evidence of the disease.

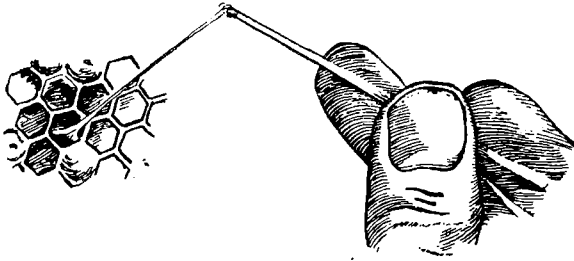


FIG. 2. SHOWING ROPY NATURE OF AMERICAN FOUL-BROOD.

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Later on this glue-like substance dries up into the before-mentioned black, scale-like body. When the scale is scraped off and held to the nose a strong objectionable smell can be detected. Some beekeepers may fall into the mistake of supposing a colony to be clean when there is no objectionable odour, but the disease must be in an advanced stage before this is noticeable. It is through honey being put into these cells that it becomes a source of infection, and, however little disease there may be in a colony, the honey in the hive is liable to contain the germs of disease. Uncapped diseased cells may easily pass unnoticed, especially when the comb is empty and there are no capped cells to betray its presence. To detect the disease in such a case, stand with the sun shining over the shoulder from behind and hold the comb horizontally with the top bar towards the body. The light will strike on the lower side of the cells and will show up the dried scales of disease.

#### SOURCES OF INFECTION.

Foul-brood is highly infectious, and is spread chiefly by the robbing of diseased colonies, honey being the chief agency by which the disease is transmitted from colony to colony. When a diseased colony becomes too weak to defend its stores it is liable to be robbed out by bees from healthy colonies, and in this way the germs of disease are carried. The principal causes of infection may be stated as follows: (1) Healthy colonies robbing infected colonies; (2) the acquisition of infected swarms, colonies, hives, and appliances; (3) supplying bees with honey or combs from an infected colony; (4) indiscriminately manipulating first diseased and then healthy colonies without taking proper precautions to disinfect the appliances used; (5) exposing diseased combs or honey to robber-bees; (6) the use of honey from diseased colonies for making queen candy, which acts as a fertile source for distributing foul-brood from one apiary to another.

#### BASIS OF TREATMENT.

Bees may be successfully treated during any period of the honey-flow, but the most desirable time is shortly after the beginning of the main flow. At this time there is little danger of robbing. In

the colder months, if diseased colonies are detected, the bees should be put on clean drawn-out combs, fed on warm syrup or frames of honey from a clean hive, and left until the spring. Although this operation may not effect a cure, it acts as a temporary check to the disease, and removes the possibility of an outbreak of the trouble being transmitted to other colonies should robbing take place. When this instruction is followed the colony requires to be marked for examination when the first spring work is undertaken.

Experience has proved the efficacy of the McEvoy treatment all the world over, and it is strongly recommended by this Department. When treating a colony it is necessary that there be sufficient bees to form a average-sized swarm. Where the disease is so far advanced as to have left few bees in the hive, then it would be safest to destroy the bees and bee-combs by fire. Tinkering with such a colony would be both useless and dangerous.

Preferably the treatment should be done in the evening, but this is not always possible. When hives are in close proximity to those about to be treated it is safer to close their entrances. This will prevent the bees from the diseased hive gaining admission, and also stop robbing. Prepare a set of frames with a  $\frac{1}{2}$  in. strip of foundation wax (called a starter) in each. Next place these frames into an empty body ready to receive the bees. Shift the diseased hive to one side, and place the prepared hive containing the starters on the old stand previously occupied by the diseased colony. The combs with adhering bees are then removed one by one, every bee being brushed off into the prepared hive. The diseased combs are put into a spare hive-body, and covered up as quickly as possible; then remove every portion of the infected hive, including the diseased combs, out of reach of the bees. In four days' time the frames containing the starters are removed from the prepared hive and full sheets of foundation put in their place. The bees must be brushed off quickly and quietly without using much smoke, so that they get very little of the infected honey that has been stored in the combs built from the starters. The foregoing treatment, if carried out carefully and according to instructions, will effect a complete cure. This is accomplished by the bees utilizing the diseased honey in their honey-sacs for the purpose of comb-building; thus when shifted again at the end of four days they start clean. The colonies should then remain healthy unless further infection be gathered from an outside source.

#### SAVING HEALTHY BROOD.

~~When there is a large amount of healthy brood which is only slightly infected the hospital treatment may be followed with advantage. Place a queen-excluder over a strong, slightly infected colony, above which supers containing infected brood are placed. The excluder prevents the queen from making use of the affected combs while the brood is emerging. In fourteen days most of the brood will have hatched out, after which the supers can be removed and the combs stored in a place of safety until ready to melt-up or destroy. Now proceed to treat the colony as previously explained. In cold weather do not tier up too high, as there will not be sufficient bees to take care of the brood, and some of it may be chilled. If the disease reappears it should be treated again.~~

It must be remembered that hospital colonies are extremely dangerous, and are likely to be a continual source of reinfection. They should be placed at some distance from the main apiary, and the greatest care exercised while they are in use. The hive-bodies must be bee-tight except for the entrance, and they should be treated before the main honey-flow ceases.

#### INFECTED MATERIAL.

The combs, if not too badly infected, may be melted into wax, or, if insufficient in quantity for that purpose, they and their frames had better be burned and the ashes buried. Where the beekeeper decides to convert his combs into wax, the utmost care should be taken to destroy by fire all refuse. The ashes and water should be put into a deep hole and buried.

The hives and appliances may be treated by boiling in a strong solution of caustic soda and water, or, if preferred, the inside of the hives may be scorched with a painter's blow-lamp.

As already mentioned the beekeeper himself is often the cause of spreading disease by carelessly manipulating foul-broody colonies and then healthy ones. Prevention is better than cure. It is therefore recommended that he should disinfect his hands and appliances with any of the well-known germicides.

#### NOTES AND CAUTIONS.

On no account should honey be fed to bees; sugar syrup is cheaper and better. Honey from diseased hives may be used for table purposes.

Take the precaution to dig round about the hive so as to bury any honey which may have been spilt.

No treatment will be successful when the bees are allowed to get at any of the combs or honey from an infected hive.

"Eternal vigilance" should be the watchword of every beekeeper who hopes to control diseases.

Combs should not be exchanged from one hive to another until the apiary is free from disease.

Occasionally colonies swarm out after treatment, but this is not likely to occur when honey is being gathered freely. It can be guarded against by placing queen-excluding zinc across a wide entrance until there is brood in the combs.

All swarms from an infected apiary should be treated as if they were diseased.

Keep robbing in check as much as possible.

Should the weather be unfavourable for honey-gathering, it is advisable after treatment to feed a little sugar syrup.

Do not wait until the winter to melt up the wax and clean the combs. Do it at once.

Diseased combs should be immediately removed, so as to avoid reinfection.

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