

Two Foul Brood Propositions.

—Dr. Wm. R. Howard.

On page 301 *American Bee Journal*, of Sept. 7th, 1893, a request was published to send me specimens of foul brood for microscopical examination; the request was made by Mrs. Jennie Atchley, of Beeville, Texas, whose desire it was to have the subject thoroughly investigated, trusting to me entirely the course to be pursued.

This was the source of furnishing me with specimens of foul brood from several sources, from which I have made more than one hundred cultures. For the benefit of bacteriologists, I will state that the culture media employed were potato, gelatine on plates and in tubes and stab cultures in agar-agar.

Proposition I—That the queen does deposit eggs in cells containing the dark coffee-colored dried mass, resulting from the drying of the viscid ropy remains of foul brood, which, though tougher than the wax, yet easily dissolved in water, contains the germs of foul brood with sufficient vitality to produce the disease.

Proposition II—That honey is stored by the bees in these foul cells, and sometimes capped, thereby retaining the germs of foul brood as long as the comb last; that the honey in these cells is not detrimental to the vitality of either *spores* or *bacilli* which are productive of the disease, and that in such cells the *spores* and *bacilli* are found suspended in the honey still retaining their vitality.

I received from Hon. R. L. Taylor, of of Lapeer, Mich., Sept. 11 1893 the first specimen of foul brood, which contained brood from five or six days old up to sealed brood. On careful examination it was found that the youngest brood was diseased, and in a few cells there was the brown dried mass of foul brood which attracted my attention, and cultures were made from those found in the empty cells, and besides the *bacillus alvei*, other micro-organisms were found which I shall merely mention here.

The next important specimen was received from D. D. Johnson of Summit Mills, Pa., this was interesting as many cells contained the dried mass, the remains of foul brood, though the cells were empty, besides, dead sealed and unsealed brood. This was received Sept., 19th, 1893.

From C. P. McKinnon, of Bangor, Iowa, Sept., 27th, 1893, I received a very foul

specimen which was found to contain the same as the first. Cultures were made from each of these specimens.

No one up to this time had sent me combs containing honey which I had hoped to receive, so I wrote to Wm. McEvoy, of Woodburn, Ont., asking him to send me combs of foul brood with honey in the adjacent cells; and not receiving word from him in due time, I addressed him a second time, stating explicitly what I wanted. He sent me two combs six by eight inches containing brood of all ages, foul brood of all stages, and honey stored by the bees in the adjacent cells, some of which were capped or sealed. It was the foulest mess I ever saw and the foulest smell I ever smelt. Of this specimen I sent to Mrs. Jennie Atchley of Beeville, Texas, a piece four inches square out of the worst, and in a few days received the following regarding its characters:—"It is sure enough *foul* and as dangerous as yellow fever."

The work dissecting these combs revealed the same facts as before in regard the young brood in the foul cells; and further, in regard to the honey, very few cells were sealed. In nearly all the unsealed cells was found the hard dark coffee-colored mass of decayed foul brood, containing the *spores* and *bacilli* of foul brood. To make sure that I might not be deceived, I carefully examined the cells, every one, which were capped by the bees, and in nearly every instance was found the same hard mass of old foul brood; these were carefully dissected out and examined and found to contain both the *spores* and *bacilli*, from which cultures were made. With these I had less trouble in obtaining pure cultures as I had fewer micro-organisms to contend with which was as I anticipated. My next move was to take the honey dipped out of these sealed cells, without disturbing the cell-walls, and examine with the microscope, which revealed both *spores* and *bacilli* suspended, from which pure cultures were obtained.

After communicating these facts to Mrs. Jennie Atchley and Mr. Wm. McEvoy in detail, they urged me to make known at once the results of my investigations in this line. Not wishing to be in too great haste to rush into print, I carefully went over my work again, taking extreme precautions that no error might be made. I arrived at the same conclusion as before.

In making these last cultures from honey twelve were on potato, six on gelatine plates both excluded from oxygen, and eight stab cultures in agar-agar, each giving satisfactory results.

I am now preparing the manuscript for the entire report of my investigations, to be