

## Foul Brood.

**E**ARLY last June we had a specimen of foul brood sent to us from a correspondent in Kent which differed in some respects from ordinary foul brood. Upon examining it under the microscope, the ordinary *Bacillus alvei* of foul-brood was not found, but another one, quite distinct, was seen. We at once inoculated two tubes of nutrient gelatine and agar-agar, and the growth in these was quite different to the usual appearance of the ordinary bacillus. Whether this is a pathogenic species or not we have not had the opportunity of testing. It may, however, be interesting to our readers if we reproduce an article by M. Canestrini which we have just found in the *Ltti della Societa Veneto-Treutina di Scienze Naturali*, published in Padua, and which throws some light on a new bacillus discovered by M. Canestrini, although no definite conclusions from the experiments can be arrived at:—

‘ON A NEW *BACILLUS* FOUND IN BEEHIVES.

‘On the 10th of March last Signor Luigi Martini, director of the Bacteriological Institute of Osino, in the Marche (Central Italy), wrote me as follows:—

“Here in the Marche, where bee-farming has made sensible progress, almost all the hives have been recently attacked by the plague of foul brood. Many hives have been destroyed, many infected, and few enjoy immunity from the disease. A friend of mine had an apiary of forty hives, and they have been all destroyed by this plague.”

‘Being anxious to be better acquainted with this disease, I required Signor Martini to send me a piece of infected comb in a hermetically sealed case, to which request he replied with a promptness for which I am most grateful to him.

‘I thought that I had found myself face to face with a typical case of foul brood, which, from a bacteriological point of view, has been already described by Cheshire and Cheyne, Crookshank and Eisenberg; but my researches, made in conjunction with Dr. Giacomo Catterina, did not lead me to identify the *Bacillus alvei*.

‘In the cells of the piece of comb sent to me from Osino I found the brood reduced to a black and pulpy mass, which, however, did not emit any characteristic odour. With this mass I made, in the usual way, culture in nutrient gelatine, agar-agar, blood serum, and potatoes, and I was able to separate in a pure culture a distinctly characteristic bacillus.

‘It is from 4 to 6  $\mu$  in length and about 2  $\mu$  in breadth. When it is isolated it is of greater length than when several elements are united in a chain. Its two extremities are rounded, and never attenuated or clavate. It is mobile, but exhibits slow and oscillatory movements. In the mass it may be called a squat-shaped bacillus, somewhat similar to that of splenic fever *Bacillus anthracis*, and still more like *Bacillus megaterium*. It is spore-forming and ohomogenic, as I shall explain more fully somewhat further on. It is easily stained with all aniline colours by the usual methods, and also by the method of Gram. It is developed slowly in the four culture media mentioned above at a temperature of about 17° Cent., but with more rapidity at a temperature of 37° Cent. It liquefies gelatine and blood serum, and in the latter it becomes surrounded by a sheath. It is not pathogenic in the case of white mice, guinea-pigs, or crickets, but it germinates freely in the brood of bees and in the bees themselves.

‘To render this diagnosis clear, I will give the following fuller particulars.

‘In nutrient gelatine this is liquefied, and during growth of the bacillus it forms a simple funnel with a blunt and whitish apex. After a few days the funnel is surrounded by a liquid film of a rather pale pink colour.

‘In nutrient agar-agar it grows on the surface, forming a whitish film, and produces spores in abundances. The spores are 3  $\mu$  in length and 1.5  $\mu$  in breadth, and of an oval shape; they become coloured, for example, with fuchsine, if submitted to a high temperature, or by passing the cover-glass eighteen or twenty times through a flame. Very interesting is its behaviour in blood serum, in blood serum, in which it becomes surrounded by a most unmistakable sheath; several rods—as many as fifteen or twenty—may be collected in one sheath; but it usually happens that for every rod there are corresponding notches in the sheath. Moreover, in some cases the sheath is converted into a uniform sac containing many bacilli. At times there are to be seen sheaths perfectly white, or not containing any bacilli. In the same medium, moreover, a whitish film forms on the surface, and after two days it commences to liquefy it. I found it sheathed even in dead bees. In some cases the sheaths were very long, and contained as many as fifty rods.

‘On potatoes it is developed promptly, so that after twenty-four hours there may be seen on them a stain of the colour of red wine.

‘Cultivated in milk, it makes it muddy, and