

the susceptibility of the different dairy breeds. Naturally if one breed predominates in an infected country the cases will occur mainly in that breed.

A point which requires stressing is that Johne's disease spreads very slowly. Acute diseases, such as swine fever or foot-and-mouth disease, sweep through a herd in a few days, but that is far from being the case with Johne's disease. Even on a badly infected farm it is seldom that more than three or four clinical cases—*i.e.*, cases showing recognizable symptoms—occur in any one year.

#### THE CAUSE.

Johne's disease is caused by a microbe that is similar in many ways to the bacillus of tuberculosis. Especially does it resemble the type of tubercle bacillus that affects birds. Indeed for many years after the cause was first discovered by Professor Johne in Dresden in 1895, it was thought to be a peculiar form of intestinal tuberculosis and was called "paratuberculous enteritis."

Although there is evidence to suggest that the disease was present in Europe at least 100 years ago, and there is no means of knowing how much longer it was in existence before that, it was only in 1895 that Johne first detected the causal organism in the bowel lesions. Even then there was no proof that this microbe was really the cause, as Johne, and others who attempted it after him, were unable to grow it and consequently experimental work on the usual lines could not be undertaken. It was not until 1912 that Twort and Ingram found the means of growing this bacillus in the laboratory. The difficulty arose through the fact that Johne's bacillus has very peculiar growth requirements and does not grow at all on any of the media commonly used for culturing micro-organisms. In addition to that, even when a suitable medium for growth was found, the bacillus grew so slowly that only after several weeks' incubation was it sufficient to be detectable with the naked eye, whereas the majority of microbes give easily visible colonies in a few days at most. Only within the last three or four years have improved media been evolved which give a visible growth of Johne's bacilli in a somewhat shorter time.

Then, too, it is possible with almost all diseases to study them by using small animals such as rabbits, mice, or guinea pigs, but Johne's disease cannot be transmitted regularly to any of these species, and this fact was, and still remains, a very serious obstacle in the way of research work.

It is necessary to mention these facts so that it may be appreciated why our present knowledge of Johne's disease has taken so long to acquire, and why even now that knowledge is far from complete.

#### SYMPTOMS.

The earliest symptoms shown by an affected animal are a tendency to loose bloom and to have a harsh staring coat. There is nothing in this on which a diagnosis can be based, and many other diseases, of which tuberculosis is one of the commonest, produce similar early indications of their presence. But in a herd where Johne's disease is known to occur these signs, manifested at a time when the feed conditions are such that the rest of the herd is thriving well, should always be regarded with suspicion.