

of weaning upon pasteurized milk alone were specially marked, and records were kept of the results of the *post mortem* examination of them. The total number of these pigs examined was 331, and twenty-two of these were found affected with tuberculosis. As I was satisfied that they could not have contracted infection through the medium of the pasteurized separated milk, special investigation was made by Mr. W. W. H. Edwards, M.R.C.V.S., in order to determine if possible what was the source of infection. In every case evidence was afforded that the animals had been subjected to infection either through living in contact with tubercular breeding-pigs or through running in pastures wherein tubercular cows were grazing. The following are concise particulars of the pigs presumably infected from the pastures:—

Farm No. 1.—Four pigs affected, all killed the same day (batch No. 12). It was found that these pigs had been allowed to run in a paddock with cows. Examination of these cows resulted in two being found affected with tuberculosis, one being an especially bad case. No doubt the droppings of these cows infected the pasture, and the pigs thus acquired the infection.

Farm No. 4.—Two pigs included in batch No. 15 and one in batch No. 19 were found tubercular, but only very slightly affected. Investigation, so far as it has gone, shows that these pigs at an earlier period had access to a paddock where cows were running. This points to the probability of infection from the paddock produced by the droppings of tubercular cows.

Farm No. 6.—One pig (included in batch No. 20) was found to be slightly affected with tuberculosis. On inquiries being made as to whether the pigs on this farm were exposed to any other source of infection it was ascertained that one of the cows on the farm was suffering from tuberculosis. The pig, having had access to the paddock in which the cows were running, no doubt contracted the disease from the infected pasture.

In the case of the experimental steer at Wallaceville, it would be difficult to imagine how infection could have remained virulent in the unoccupied paddock for so long a period before the steer was placed in it if the specific organism were a non-sporulating bacillus, especially seeing that during the time it remained empty there were a considerable number of dry sunny days. Then again, with regard to the considerable number of station cattle which are found on *post mortem* to be the subjects of tuberculosis, it is reasonable to assume that, at any rate, a considerable proportion of them could not have become affected from their dams' milk, and consequently there is every probability that a number of them must have become infected from the pasture, and that the pasture was infected by the faeces of tubercular cows. Cows, even with pulmonary tuberculosis, rarely, if ever, when coughing, eject from the mouth sputum derived from the lung, only a light spray of mucus being ejected. This may certainly contain the specific organism, but we have no definite knowledge that it does. Even if this were the case, other cattle living under natural conditions would not be likely to directly contract infection from coughing tubercular animals running in the same paddock, and if the specific organisms are ejected from the mouth during the act of coughing the only way in which other cattle would be likely to become infected in consequence would be through the organisms being distributed on the pasture and afterwards ingested by the animal when grazing. Judged by laboratory experiments the specific organism is easily destroyed by exposure to the sun's rays; hence one would not expect paddock contamination to exist for any length of time in this country, where, as a rule, much sunny weather prevails. If, however, the organism is a streptothrix, and consequently capable of leading a saprophytic existence, propagating itself by sporulation, then it is easy to understand how paddock infection can persist for a considerable period. To my mind, the prevalence of tuberculosis in New Zealand among cattle living exclusively in the open air points very strongly indeed to the fact that the organism is not a bacillus. In any case, I am satisfied that among such cattle few, if any, become infected by inhalation, but that ingestion is the principal, if not the only, channel of infection. Even in cases where pulmonary lesions exist it is still possible that infection entered through the medium of the digestive system. We know that the specific organism can pass through the intestinal wall without any lesions resulting there, and it may even pass through a lymph-gland without producing lesions. Once the organisms gain entrance to the thoracic duct they have practically a clear passage to the lung *via* the anterior vena cava and the right heart. If it be accepted therefore that ingestion is at any rate the principal means by which cattle become infected, then it is reasonable to presume that a certain proportion become infected by grazing on contaminated pastures; and if pastures can retain contamination it is difficult to realize how a non-sporulating bacillus can be responsible, especially when it is realized that the number of cattle grazing on an average pasture will not be more than about one beast to 2 or 3 acres.

The Chairman stated that Mr. Reakes's remarks opened up a phase as to the possibility of the tubercle bacillus, or streptothrix, maintaining its vitality, and being possible, by infected pastures, to disseminate the disease among cattle.

Dr. Blackmore thought a good many people were now coming round to the conclusion that the tubercle bacillus is not a bacillus, but possibly a streptothrix. There was something very interesting in Mr. Reakes's experience with regard to infected pastures, because, if his experience were confirmed, we might learn something more than we knew at present about the life of the tubercle bacillus outside the animal body.

As regards the question of the milk-supply, Dr. Finch advocated a system of certified dairies, from which any one desirous of obtaining pure milk could be assured of getting what he required. Naturally, the charge would be more, but if there was a demand the supply would be available. Mr. Reakes stated, however, that he knew of a case in which this was done voluntarily—every possible care was taken to ensure that the public got clean milk—and the result was that the public would not pay for it.