A NOTE ON BOVINE PIROPLASMOSIS.

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So much has been written concerning *Piroplasmosis* as it occurs in different animals in various parts of the world that one may be pardoned for directing attention to the fact that the disease exists at home and is constantly coming before the notice of the veterinarian at this time of the year.

The affection receives a variety of names according to the district, but that of redwater is common enough, others, as red or blood murrain or moor ill or evil, may not be so general. Many causes were assigned as the primary agent in the etiology of redwater, but we now know that the redwater seen in bovines of both sexes when at grass is due to the presence in the red corpuscles of the protozoon, the *Piroplasma bigeminum.* There is a form of redwater prevalent at certain times of the year among parturient bovines but the cause of this so far as I know is not understood. It is probably due to some other cause than the *Piroplasma.* I have had no experience, however, of the disease and can give no opinion.

For several years past, since 1901, I have been aware of and have taught the presence of the *Piroplasma* in the blood of bovine animals suffering from haemoglobinuria[1], and through the courtesy of many members of the profession in Ireland I have received specimens of blood from many different parts of the country. Rarely have I failed to demonstrate the parasite. Quite recently I have had experience of three different outbreaks and in all the blood showed the Piroplasmata in abundance.

The tick found upon the affected animals is the *Ixodes reduvius*[2].

[1] There is a haemoglobinuria affecting equines in the winter months particularly, known commonly in the veterinary profession as azoturia, but the cause is unknown.

[2] Specimens of these ticks were sent to Dr Nuttall for identification.

It is generally admitted that young bovines possess a considerable amount of immunity to the disease, but I have reason to believe that this is not so great, at any rate in animals approaching a year old, as is supposed. Young bovines, yearlings, do suffer from redwater and badly. Quite recently I saw two young bullocks, the urine in each case was the colour of port wine, the temperature 105° F., with numerous Piroplasmata in the blood. Both animals made good and speedy recoveries in contradistinction to a year-old heifer and an aged cow. The latter died, the heifer had a prolonged convalescence. On the same farm where these cases occurred two young bullocks had died prior to my visit from the disease. More than 50 cases have occurred on this farm this year.

In another case observed more recently the Piroplasmata were readily found in the blood of a milch cow. She is recovering, and her milk which had ceased at the onset of the attack is returning and I understand her urine is quite normal in appearance. Parasites though not numerous can be found without difficulty, 2–4 infected corpuscles being found in a field of the immersion lens. Apparently blood corpuscle destruction has ceased, but a very interesting fact was noted at the time of the appearance of the high-coloured urine and before the milk had fallen away, and that is a discoloration of the milk, evidently a tinging of the milk plasma with the haemoglobin in solution.

It is well known to those who occupy farms where animals are subject to redwater that the cattle reared upon the farm enjoy an immunity to the disease which attacks and rapidly kills off animals purchased and brought on to the farm. The explanation is probably that the natural immunity possessed by the young bovine is rendered active and durable by an attack of *Piroplasmosis,* which passes unperceived; that during the immunity period infection occurs which is thrown off, but it is sufficient to render the animal immune to redwater during the remainder or greater part of its life. I am convinced that young bovines do suffer from *Piroplasmosis* and that the disease becomes chronic, and that it claims many victims.

I have recently had under observation a number of young animals suffering from a disease of a very obscure nature. The symptoms were those of chronic persistent anaemia, great wasting, and colliquative diarrhoea. The temperature remained normal, but the appetite was fickle and often absent. On post-mortem examination, save for the liver and gall-bladder, there was nothing apparent to account for the condition. The liver was, in most cases, not in all, infected with fluke (*Distoma hepaticum*). The liver was cirrhotic and enlarged, the gall-bladder

dilated enormously and filled to repletion with bile. In one case 80 fluid ounces of bile were measured ($2\frac{2}{7}$ litres). The results of bacteriological examination have been negative. Prolonged examination of the blood carried over several months has demonstrated isolated *Piroplasmata* in the resting condition in the last schizogonous stage. Exceptionally a twin parasite has been found in experimentally infected animals. Massive inoculations of blood into healthy young cattle of approximately the same age have given reactions of temperature of approximately 5° F., after an incubation period of seven days, and the animals are steadily losing condition. The *Piroplasmata*, few in number, are to be found in the blood corpuscles. In this form of the disease there is no haemoglobinuria. We intend continuing the work and instituting some tick experiments and hope later to publish our results.

A note on the Sarcocystis tenella.

Sarcosporidiosis is not uncommon in the heart muscle of sheep where the encysted parasite may be observed lying dormant as a deeply stained, sharply delimited body in the muscle fibre. Quite recently my colleague (Prof. G. H. Wooldridge) and myself have found the spores in relatively large numbers in sheep dying from an affection believed at first to be ovine *Piroplasmosis*. The spores are banana-shaped with one extremity pointed, they average 14μ in length by 5μ in width. Stained by the Romanowsky method the pointed extremity stains with eosin, the body of the spore which is granular stains blue. The nucleus, which is clearly differentiated, possesses a well-defined nuclear membrane, is placed towards the blunt end, and has the chromatin stained purplish-red. I have seen the "spore" in the blood. Like Laveran and Mesnil we have failed to find any filament projecting from the anterior extremity. As a minor point I have seen the encysted parasite in Purkinje's fibres of the heart muscle, a situation in which Doflein (1901, *Die Protozoen*, p. 221) states they have been found and figured by Schneidemühl. Since this note was written I have observed numerous spores in a preparation made from the heart of a young bovine.