DISEASES OF CATTLE TRANSMITTED BY TICKS

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ONE of the main problems which confronts the cattle breeder in Ceylon is the Cattle Tick, and the diseases which it is responsible for transmitting.

Of these diseases, at least three occur in Ceylon, and they are of considerable economic importance. The causes of all three diseases are protozoan organisms, which invade the bloodstreams and destroy the red blood cells, resulting in high fever, anaemia and loss of condition. Although the above features are common to all three conditions, yet they differ very widely from each other in the pathological reactions induced by them in infected cattle. Certain individual features will be dealt with in detail later.

These diseases are widely distributed in Ceylon. A feature of them is that calves and young cattle do not develop such serious symptoms as adult stock.

When calves and young cattle are allowed to graze, they become infected at an early age, and do not exhibit any very severe symptoms. The fact that they are infected will generally escape the owner's notice. While they do not seem to be seriously ill, yet infection with these parasites has the effect of retarding their rate of growth and preventing them developing as they should. Cattle infected at an early age grow up with a very considerable resistance to these diseases.

This is particularly true of cattle of the Ceylon and Indian breeds. If the cattle escape infection in the early stages, they grow up without having acquired resistence, and if they become infected later, when they are adult, they develop the disease in a more severe form. This is why severe cases are often seen in cattle which have been reared in sheds up-country and are taken to the low-country when they are adult. Because they have been reared in sheds and not allowed out for grazing many of them escape infection, and only contract it when brought down to the low-country where they are not confined to the shed.

In parts where these diseases are enzootic, cattle of the indigenous breed rarely or seldom show symptoms enough to attract the owner's attention, but if cattle from an area where these diseases do not occur, are introduced into an enzootic area and exposed to attacks of infected ticks, very severe symptoms may be produced.

It is well known to cattle breeders in the low-country who use cattle of the local and Indian breeds, that these diseases are of comparatively little importance and rarely assume serious proportions. But once they make up

their mind to improve their cattle by introducing cattle of European or Australian breeds, they become of very great importance. In fact these diseases are the chief obstacle to the use of imported stock for breeding purposes.

The severity of the disease will depend on several factors such as the degree of resistence of the individual animal concerned, the kind of parasite with which they become infected, and the extent of infection. A brief description of the three common parasites found in Ceylon with their characteristics and the disease they produce will be useful.

(*a*) The most important is *B. bigemina* which is found in the red blood corpuscles. It is usually found in a characteristic double pear shaped form, consisting of two large parasites with their pointed ends opposed to each other or in contact at an acute angle. The condition it causes is commonly known as " Red Water " on account of the red colouration of the urine which occurs in many cases. The period of incubation varies from eight to ten days, but sometimes may be up to a month. In the early stages there are no striking symptoms. The appetite may not be so good and there may be a slight reduction in the milk yield. If the temperature is not taken the rise of temperature may be overlooked. The urine may or may not be red in colour. Respiration and pulse may be accelerated. In mild cases improvement is indicated by the gradual falling off of the temperature and the restoration of the appetite, but on account of the great loss of red corpuscles several weeks or months elapse before recovery takes place.

In severe cases the early symptoms are followed by serious illness. Breathing becomes accelerated and laboured. After three or four days the animals become so weak that they continually lie on the ground. The appetite is completely lost, severe constipation sets in, and the urine is blackish red, or almost black in colour. Eventually death takes place.

(*b*) The second parasite is *Anaplasma marginale* or *centrale*. It is a small rounded body usually occurring singly, but sometimes in pairs, situated at the border of the red corpuscle or at its centre. The period of incubation varies from 13 to 14 days. In typical cases of anaplasmosis there is rise of temperature with prostration, laboured respiration, constipation or diarrhoea. In many cases the affected animal shows a great desire to eat sand or earth. Red colouration of urine is not produced by this parasite. At a later stage anaemia and jaundice develop, and then the animal becomes rapidly emaciated. This condition is not so common as Redwater, but it is one more likely to end fatally.

(*c*) The third parasite is known as *Theileria mutans*. A small red oval or round shaped parasite of the red blood cells. This is a very common parasite in Ceylon, and nearly all cattle are affected with it. Generally it appears to produce very little effect, although it is capable of setting up symptoms comparable to a mild form of Red Water. It does not cause red colouration of the urine. When it gives rise to clinical symptoms, these appear after an incubation period of 20 to 45 days, and they consist in moderate variations in temperature and slight anaemia. Recovery is usual and fatal cases seldom occur. Although a comparatively harmless parasite, imported animals may be infected with fatal results.

Control.—The most effective method of preventing and eradicating tick fever and the allied conditions, consists in the extermination of the transmitting agent, and lasting results can only be achieved in this way. In order to catch the tick on its hosts, tick destroying measures should be applied at short intervals. The dipping preparation used for destruction of ticks is an arsenical solution, the most effective being a solution of sodium arsenite. This is a constituent of the preparation known as Cooper's cattle dip.

Washing and spraying.—The dip fluid can be applied to the body by spraying. This can be done by means of a hand pump provided with a tube and a spraying nozzle. Great care must be exercised to prepare the dipping fluid to the correct strength lest fatal poisoning result.

Dipping.—This constitutes the most effective and rapid method of treating large numbers of cattle. The advantage of dipping tanks consist in the uniform manner in which all parts of the body are exposed to the fluid. Dippping either kills the ticks attached to the skin or incapacitates them from producing living progeny.

Treatment.—Cows brought from up-country to a low-country dairy by train, or purebred animals newly imported from abroad should be examined thoroughly for young ticks. If found they should be sprayed with Cooper's Cattle Dip. Their temperature should be taken morning and evening and any rise of temperature regarded with suspicion. When there is a rise of temperature blood films should be made and sent to the Veterinary Laboratory, Peradeniya, for microscopic examination, and if possible a veterinary surgeon should be consulted.

The animal should be made comfortable with a good bedding of straw. Half a pound of Epsom salts or common salts should be given as a drench if the bowels are inclined to be a bit costive. Further treatment will depend on the kind of parasite found in the blood. If the blood films show *B. bigemina* the treatment consists in the administration of certain preparations.

Formerly Trypan Blue was administered in doses of 40 to 50 c.c. of a 2 per cent. solution by the intravenous route. Intravenous injections must be performed carefully, as any trypan blue escaping into the subcutaneous tissues may cause swelling, suppuration and even necrosis. This method has the disadvantage of colouring the tissues and secretions bluish green, and this may last for several weeks making the flesh objectionable for human consumption.

The above treatment has been largely replaced by the administration of Trypaflavin (Acriflavin). It is very effective against *B. bigemina.* It is administered intravenously in 2 per cent. solution an adult animal getting about 40–50 c.c. In this case, as with trypan blue, escape of the fluid into to the subcutaneous tissues causes complications. It produces only a temporary staining of tissues and is rapidly excreted in the urine.

Recently acaprin (Urea compound produced by Bayers) has been largely used against Tick fever and is considered to be equal to Trypaflavin. As it is a colourless compound it causes no staining of tissues. The treatment is harmless, although within a few minutes of its injection it causes restlessness,

muscular tremors and salivation. These symptoms may cause anxiety to the owner, but usually pass off in a few hours. A small dose of Adrenalin or Rephrin may be given after Acaprin to counteract any undesirable effects.

Acaprin is given subcutaneously or intramuscularly and not intravenously. The dose being 2 c.c. of a 5 per cent. solution for every 2 cwt. body weight.

If the blood examination shows anaplasmosis the prognosis is not so good as in *B. bigemina*. Many preparations which are effective in Piroplasmosis such as trypan blue, Acaprin and Trypaflavin have been tried with unsatisfactory results. So far the best curative measures consists in giving N.A.B. by the intravenous route. This should be done as soon as possible, after a definite diagnosis is made. In case of weakness and collapse, stimulants consisting of arrack and ginger juice may be administered.

Infection with *T. mutans* usually occur with no outward signs of the disease. When it gives rise to clinical symptoms, recovery is usual and fatal cases rarely occur. There is no specific drug, but N.A.B. may be given with advantage.

In all these diseases there is considerable destruction of the red blood cells of the blood resulting in anaemia and jaundice. Thus tonics are of great value when the acute stages have passed. A good tonic powder consists of powdered sulphate of iron, nux vomica and powdered gentian, a drachm of each, once a day, given in food or administered as a drench. Good feeding and careful nursing are important.