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## NOTES ON A SERIOUS OUTBREAK OF TICK PARALYSIS IN CATTLE

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Except in the case of sheep, most reports on tick paralysis deal with individual cases or at the most a comparatively few animals in a herd. In cattle, wholesale outbreaks are apparently extremely rare, and the writer in examining the literature on tick paralysis in North America, Australia and Africa has been unable to find any reference to an extensive outbreak of this nature. In early April, 1930, complaints were received of a "plague of ticks" causing losses in cattle in the Nicola district, and the writer was able to obtain some first-hand knowledge of a really serious tick paralysis outbreak of most unusual proportions. The particular spring pasture field in which the outbreak occurred has received much attention in our tick survey work during the last four years, but we have been unable to arrive at any very definite explanation for such an unexpected and intense outbreak. No further cases of paralysis have occurred in this field since 1930, but since that time only horses or mature cattle have been placed on this range during the tick season. Since there seem to be no further developments in this outbreak, it is thought advisable to report on it at this time.

The history of the outbreak is as follows: Subsequent to de-horning in the first week of April, a herd of 900 yearling steers was turned out on the usual spring range, which had been used for the previous fifteen years without any similar trouble. Several days after the animals had been turned out, it was noted that one or two were down with large numbers of ticks attached and showed evidence of paralysis. The ticks were taken off and the animals recovered the day after their removal. The situation became increasingly serious, however, and about April 14 as many as twenty head were observed down in one day. It was therefore planned to move the stock out of this range to another one further back, but before this was done it was decided, in view of the heavy infestation and weakened condition of the animals, to give treatment to effect the removal of the ticks; and the steers were accordingly rounded up during the four days following the 16th of the month and were treated in the de-horning chutes. The method of treatment consisted of hand-picking the larger engorged ticks (giving especial attention to animals showing "staggers") and applying the following mixture to the parts mainly affected by ticks: coal oil (4 gallons), lard (10-lbs.), sulphur (2-lbs.). This was applied to the back of the head, along the neck and shoul-

ders, and to about halfway back along the backbone. Animals down on the range or too weak to be brought in were hunted up and the ticks hand-picked. Many of the animals so treated recovered on the following day, but others in a more advanced stage of paralysis died rather rapidly, usually within two or three days of the onset of the trouble. Good mortality of ticks was realized by the above mixture, but it was inclined to cause blistering; and raw linseed or raw cottonseed oil, together with oil of pine tar, appeared to the writer to be preferable and was substituted and proved very successful.

### Symptoms of Tick Paralysis in Cattle

The animals first appear "dopey," listless and disinclined to feed. They later show weakness and stagger slightly, the front legs appearing to be worst affected, often splaying out slightly in walking. Lack of co-ordination is marked. The weakness increases fairly rapidly and the animal collapses, usually assuming a characteristic attitude with the head thrown back against the shoulder. Much struggling may occur when the animal attempts to rise, the front legs usually doubling under, and the steer crashing on its shoulder and neck with such violence that one would expect the neck to break. On the steep sidehills the animals may struggle and drag themselves downhill for several hundred yards, but usually attempt to get into dense brush. In more advanced cases respiration is rapid and heavy, the eyes are staring and protruding and have a bluish-white appearance, and the coat becomes moist.

Temperature records of paralysed animals taken at Nicola on April 20 and 21 were as follows: 102.1, 102.2, 102.2, 102.4 and 103. These five cases had had all engorged ticks removed for about eight hours and some of them showed signs of recovery, all being practically recovered on the following day. The latter two animals had shown almost complete paralysis and lay flat on the side with the neck stretched out. Temperatures of three animals noted paralysed on the range, and which still had ticks on them, were 101.5, 102 and 103.

On removal of the ticks little change was noted at first, but in many cases within twenty-four hours the animals appeared quite healthy and active. The animals in more advanced stages of paralysis failed to recover and died within a day or two.

### Amount of Infestation

A marked variation in the amount of infestation was noted in different animals, although the majority appeared to be fairly heavily infested. On a few steers no ticks or signs of previous attachment were noted. On the more heavily infested animals at least 150 ticks were estimated to an animal. In one case an animal had just died

and ticks (engorged, partly fed and flat) were noted leaving it. Eighty-two were collected on and near the animal, and this was probably only about half of the actual number infesting this beast, since ticks were noted on the ground in considerable abundance. In many cases as many as twenty or more fully engorged ticks were noted clustered at the base of the skull behind the horns and at the peak of the shoulder; these were the two favourite situations for attachment, although many were noted along the top of the neck and along the backbone to about the middle of the animal. Over one hundred specimens were examined and all proved to be *Dermacentor andersoni*. No *Dermacentor albipictus* were found, although this species occurred in some numbers on horses on this range in March.

#### Weather Conditions

Many exceptionally warm days occurred from early April to the 20th of the month, and animals brought in from the 17th to the 20th had large numbers of ticks on them, and as many as one-third going through the chutes showed signs of weakness and were "staggy." Colder weather commenced on the 21st and scattered showers occurred. The animals brought in on this day were noticeably less infested with ticks, and in a number of cases it was noted where ticks had been attached in numbers but had dropped, leaving many animals almost free. Only a very small proportion of the animals showed symptoms of paralysis on this colder day. About fifty steers that were missed in the first round-up were found higher up on the hill above 3,000 feet on April 23 and were almost free from infestation.

#### Range and Rodent Conditions

The range on which the tick infestation occurred has a southwest exposure and a fairly steep gradient, rising to an elevation of from 3,500 to 4,000 feet. Much open grassland occurs in the lower levels, bunch grass predominating and being unusually plentiful. (Water shortage due to the dry season protected the lower areas from over-grazing last year.) Somewhat sparse areas of greasewood occur here and there, and there are fairly extensive patches of brush, consisting of poplar, willow, black pine, wild rose, etc. An occasional solitary yellow pine occurs here and there. The higher levels are fairly heavily timbered, mainly with black pine. Several small lakes and sloughs occur fairly high up, and the lower levels are well watered early in the season with small streams. The cattle were mainly grazing low down, about 2,000 feet and under, and had not penetrated into the upper more densely timbered areas. There was little indication of poisonous plants.

Rodent conditions noted were as follows: A number of rocky outcrops provided excellent conditions for ground-hogs, which were particularly abundant. All through the open grassy areas pocket gophers were noted to be very numerous, and red squirrels were common in the timbered areas and scattered clumps of brush. Coyotes were evidently very scarce since the carcasses lying on the range remained untouched. Wood rats were stated to be rare, and Columbia ground-squirrels to be absent on this range. Chipmunks and white-footed mice were very abundant, however. Mule deer were not uncommon in the higher areas.

An interesting feature of this outbreak was that cattle on adjacent and somewhat similar range (except for exposure) were not affected and, as far as our information indicated, very little trouble from paralysis occurred in cattle elsewhere in the Nicola district. In spite of the unusual abundance of ticks in 1930, less than the average number of cases of tick paralysis were reported in cattle or human beings in the North Thompson valley and elsewhere in the dry belt; although a number of cases were later reported in sheep in the Nicola, Aspen Grove and Keremeos districts.

#### Number of Cases, Losses and Secondary Maggot Injury

Approximately one hundred animals, or over 10 per cent. of the herd, showed symptoms of paralysis and more than sixty-five of these were known to have died. Placing the value of steers at that time at \$60.00 each, the loss from actual mortality amounted to \$3,900.00. In addition to this direct loss the herd was weakened and set back, both from severe infestation with ticks and from the driving and handling necessary in carrying out control.

A serious secondary cause of injury resulted from severe maggot infestation noted in some sixty-five of the paralysed animals. In some cases the places attacked by ticks from the back of the head, over the shoulders and a little way along the backbone were infested with thousands of maggots, mainly quite small at the time. In some animals that were still living the vertebrae and bones of the shoulder were quite exposed. (The maggots when reared all proved to be the black blowfly, *Phormia regina*, the usual fly producing myiasis in sheep and cattle in British Columbia.) No such infestation was observed in animals that had not been paralysed. The contributory causes to this infestation appeared to be as follows: The forelegs of the animal seem to be most severely affected in the early stages of paralysis, and the steer, retaining a little strength in the hind legs, would attempt to rise, only to fall forward on the shoulders and neck. The broad tracks on the sidehills showed plainly where the animals had struggled and

rolled as much as several hundred yards down the slopes, causing abrasions and injuries in striking rocks, and in most cases tearing off the scabs on healed-over stumps of the horns and crushing engorged ticks. These injuries and the helpless condition of the animals which prevented them from fighting off the flies doubtless contributed to the amount of maggot infestation. The possibility of serious losses from this infestation led the writer to advise further treatment to prevent this. The coal oil-lard-sulphur mixture applied for tick treatment, while most effective in killing the ticks, did not appear to have any lasting properties for repelling blowflies; and it was therefore suggested that oil of pine tar be used to afford protection to such animals as showed injuries which would offer suitable conditions for blowfly infestation. It was also advised that if it were found impracticable to burn or bury the dead steers on the range, these should be well soaked with creosote oil to reduce fly breeding.

### Synopsis

Unusually severe outbreak of tick paralysis occurred in a herd of 900 yearling steers at Nicola, B.C., in April, 1930.

Cattle were treated with coal oil-lard-sulphur mixture to remove ticks. This mixture was found to cause blistering, so raw linseed or raw cottonseed oil, together with oil of pine tar, was substituted with satisfactory results.

Many animals recovered within twenty-four hours of treatment, but others in more advanced stage of paralysis died rather rapidly, usually within two or three days of the onset of the trouble.

Average infestation was about 150 ticks to an animal. Infestation occurred at the back of the head, along the neck and shoulders, and to about halfway back along the backbone. All ticks examined proved to be *Dermacentor andersoni*. No *Dermacentor albipictus* found.

Weather had been exceptionally warm, but turned colder from the 21st of the month. Infestation was markedly less during cold weather.

Range had southwest exposure and rose to elevation of 3,500 to 4,000 feet. Much open grassland, with fairly extensive patches of brush. Higher levels fairly heavily timbered. Cattle were grazing at the time on lower levels.

Chipmunks, white-footed mice, red squirrels, pocket gophers and groundhogs were very abundant; mule deer occasionally noted on higher levels; coyotes, wood rats and Columbia ground-squirrels were absent.

No trouble was noticed on similar adjacent range; and number of cases of tick paralysis in humans and cattle in the dry belt during that year was lower than usual.

Approximately 100 animals, or over 10 per cent. of the herd, showed symptoms of paralysis; 65 were known to have died, making a loss from actual mortality of \$3,900.00.

Severe infestation by maggots of *Phormia regina*, which occurred only in paralysed animals, threatened further serious loss. Affected cattle were treated with oil of pine tar to afford protection from blowflies.

