

BRITISH COLUMBIA ENTOMOLOGICAL SOCIETY.

PROCEEDINGS, 1916.



NOTE.—The Fifteenth Annual Meeting of the British Columbia Entomological Society was held in the Provincial Museum, Parliament Buildings, Victoria, B.C., on March 11th, 1916. This Bulletin No. 9 contains the more economic papers of practical or popular interest to fruit-growers and farmers, and in the matter of page numbering is a direct continuation from Bulletin No. 7.

The resolutions and business transactions of the Society, following the Fifteenth Annual Meeting, have been separated from the papers and articles given at the meeting and will appear as a supplementary report.

NOTES ON THE WOOD-TICK (*DERMACENTOR VENUSTUS*).

BY J. WM. COCKLE, KASLO.

Some years ago I was asked by the late Dr. Fletcher to write an article on wood-ticks, and thinking I knew a lot about their varied idiosyncrasies, I committed my observations to paper. The article never appeared in print, as our dear old friend, Dr. Fletcher, wrote me upon the receipt of the article that he would refrain from publishing it because he considered the average reader would consider that my imagination had probably superinduced a temporary attack of hallucination, and in their opinion I should be immediately elected to the presidency of the Ananias Club.

Since then I have gained in years, and during this time I have had to carry the weight of the reputation of having written for publication a true fish story, so that now, having survived this weighty reputation, I think I can more easily carry the onus of having written some facts about wood-ticks which may be received with scepticism.

In the report of the Dominion Entomologist for 1914, under the heading of "Insects affecting Animals and Man," appears the following: "Our inquiries in regard to the distribution of ticks in British Columbia, and especially of *Dermacentor venustus* on account of its relation to the obscure disease termed tick paralysis in children, has been continued and additional data has been secured." As far as I know, the only data which has been published was that splendid report on tick paralysis in lambs caused by *D. venustus* which was published by our mutual friend, Dr. Seymour Hadwen. This report appealed to me most strongly, as prior to taking up his research-work in regard to this tick I had the pleasure of first meeting Dr. Hadwen and discussing with him the subject of ticks.

The investigation which was started by the Entomological Department regarding ticks originated from a press report which appeared in many Eastern papers, which stated that I was responsible for the statement that ticks produce spinal meningitis, and that there were records of deaths having resulted from this disease in the Kootenays. This statement was entirely wrong, the press reporter having confused spotted fever, spinal meningitis, with the Montana spotted fever. I received a letter by first mail from Dr. Hewitt asking if I had made such a statement. This happily I was able to deny. But the fact remained that there were records of several children who had died from the effects of a tick having attached itself at the base of the skull, causing paralysis and death. Several other cases were recorded where

the child was completely paralysed, but recovered upon the removal of the tick. My object in writing to the papers at this time was to point out that there was danger from wood-ticks when they attached themselves to young children, and this letter and the subsequent agitation which it provoked was the initial point from which the medical faculty in Canada was brought into contact with the results which had come under the observation of several medical men in Western Canada, and led to the receipt of many letters of congratulation and thanks from parents whose children had been affected by wood-tick "bites."

The further reason of my desire to open up the question of ticks has until now remained unpublished.

It is a recorded fact that Montana spotted fever, which produced a mortality in the early times of 90 per cent., was produced by *D. venustus*, and there are also records of this same fever, but in a much milder form, from other of the Western States.

We now come down to the facts regarding *D. venustus* and its ally in British Columbia. I am speaking now as an entomologist, and I wish to make the statement, regardless of all contradiction, that there are two ticks masquerading under the same name. As far as structure and maculation go, they are practically identical, but one is a fever-tick and the other is not.

The ally will walk all over a person without causing any uneasiness except a crawly feeling, whilst *D. venustus* appears to attempt to gain entrance for its sucking-tube in many places, and where any such attack is made it results in a sore spot. I have seen cases where persons were a mass of small irritating sores caused by "bites" from this tick.* This slow ungainly bug crawls deliberately over one in search of a secluded spot at which to attach itself, whilst its nimble ally will travel three times as fast and attempt attachment at many points.

You may ask how I know that they are a different species if their form and maculation are identical. Well, I have watched them, and as an entomologist I know that they have nothing in common; one is a racehorse, the other a hack. This is not a scientific reason; science says that they are one, but the eye of the student fails to observe what science accepts as a fact.

Some years ago after the Department of Washington had made a thorough examination of the wood-tick situation in the Bitter Root Valley, Montana, there appeared in one of the scientific magazines an illustrated article on the subject, and in this the fever-tick was cited as *D. johnsonii*. When and by whom the change in nomenclature was made I do not know, having no reference library, but it seems probable to me that, on account of the similarity in appearance, *johnsonii* has been relegated to that ever-increasing list of synonyms from which it will some day have to be resurrected.

Allow me now to pass on to some personal narratives regarding ticks. The first tick I saw in the Kootenays was in the early spring of 1889. A friend and myself had been out to look for deer, and when we re-entered our rowboat to return home, my friend leaped suddenly out of the rowboat to secure a rock with which he pounded a poor unfortunate tick, which he discovered on the gunwale of the boat, to atoms. When asked why he used such strenuous methods and language, he told me that he had a grudge against all ticks by reason of the misery he had endured from their "bites." The reason for the rock is explained that it is almost impossible to crush a tick. If you place one on a flat board, pressing it down under the thumb with the full weight of the body, it seems only to enliven it, for when the thumb is lifted it will walk off even faster than before. The antipathy to ticks and the fiendish delight which may be evinced by one who has been the subject of their attention may be well indicated by the almost insane vindictiveness of another friend, who marooned a tick on the top of a bare rock in the middle of a sawmill pond. Every morning, hail, rain, or shine, he would row over to this rock to look at the tick and

* NOTE.—The tick Mr. Cockle refers to as "the ally" is undoubtedly *Derma-centor albipictus* (S. H.).

course it with some of the choicest vernacular to be met with, even in the pioneer West. This tick remained marooned on this rock for over three months. This seems to illustrate that the birds, like man, have an antipathy for ticks.

In the last paragraph I told you of a tick living three months on a bare rock, and now I will record another fact (please remember that these are all facts). Some years ago, when I was operating as a taxidermist, two mountain-goat heads were sent to me to be mounted. After skinning they were immersed in a solution of salt and borax. In this they remained for over a month, and when mounted they were hung up in the sun outside the shed to dry. I had noticed that there were many heavily engorged ticks adhering to the pelt and had removed most of them with a comb, but after the heads had been out in the sun for an hour or two, my attention was attracted to several heavily engorged ticks walking about over the heads. Whether it was the effect of the sun or the taste or smell of the arsenical paste with which the heads were coated which caused them to detach themselves will ever remain a mystery, but the proven fact remains that they will stand submersion, even in a saturate solution of salt, for an extended period.

The susceptibility to the attack from ticks is a mystery. One person or one horse or other animal out of a bunch seems always to be the marked recipient for their attentions. I have known men who would return from a trip through the brush completely covered with ticks—fifty or sixty ticks crawling over the body and clothes is no uncommon occurrence for even a trip of a few hundred yards—whilst their companions, who in many cases were ahead and consequently brushed off the ticks from overgrowing brush, would be practically immune. As an illustration of immunity, I may tell you that I have never had a tick attach itself to me; a very few will crawl over me, but I am not to their liking.

A farmer living in Southern Kootenay had three horses and an old mare. Ticks were very numerous in this community, but the horses seldom had any ticks attach themselves to them, whilst the mare would daily return from pasture smothered with them. The method of freeing her from their attack was somewhat novel. The farmer would drive her around until she was in a heavy sweat, and in this condition most of the ticks would voluntarily detach themselves, while the remaining ones could easily be brushed off.

The methods employed or suggested for getting rid of an attached tick are somewhat novel and varied. Some old prospectors who have had many experiences claim that they can be unscrewed; others try getting rid of them by applying a lighted match to their abdomen; others swear by an application of coal-oil or by means of a wad of chewing-tobacco placed over them. Any or all of these methods may prove effective in some instances, but the fact of the sucking-tube being transparent or nearly so renders it almost invisible to anything but a powerful microscope, so though they may apparently have been removed intact the sucking-tube often remains in the skin. When this occurs it invariably sets up a very bad ulcerous inflammation which does not yield readily to any treatment, often remaining an open sore for months. The most practical remedy is to pull the tick forward with the aid of forceps until the skin is raised, then with a sharp knife cut off the projecting skin containing the sucking-tube; a slice less than a sixteenth of an inch thick is ample to ensure the complete eradication of the sucking-tube.

With all the inconvenience that ticks produce, we may congratulate ourselves on the fact that there has never been recorded a case of Montana spotted fever in British Columbia.

I am conscious of the proverb of the "prophet being not without honour," but have full confidence that this lengthy epitome and the reputation of the writer may safely be left in the hands of the members of our Society for a verdict.

Mr. Parham: This paper by Mr. Cockle is very interesting to me. While he may have written his paper in a joking strain, the relation of ticks to agriculture is no joking matter. The relation of ticks to horses and the annoyance caused are

only too true. We have a great deal of trouble with them, especially in the Southern Okanagan country, and we find them very hard to control. There is absolutely no question that the ticks attack one person and not another, and the same applies to horses. There is no accounting for this dislike or preference; it just occurs. One method of exterminating the tick is to pull it out and cut off a piece of skin surrounding the puncture, but currycombing is a very practical method with horses. Still another common method is employed as described by Mr. Cockle, and that is to work them very hard, so as to cause profuse sweating; but this does not check them. I am very interested in all this and would like to hear further discussion.

Mr. Blackmore: I notice Dr. Hadwen is here and that he will be giving us the next paper, referring to ticks. Possibly he might have some remarks to make now or he might prefer to give us his paper.

Dr. S. Hadwen: I do not know that I can add very much to what Mr. Cockle has said. His observations are without doubt correct, and I can support his contentions on many points. I am afraid, Mr. President, that the paper I proposed to give at this meeting must be cancelled. I had expected to give you a list of the species of ticks that occur in British Columbia. Dr. Hewitt, Dominion Entomologist, however, has just issued a list of Canadian ticks which covers our British Columbia list completely. I received Dr. Hewitt's list yesterday and there is little that can be added to it now.

In regard to this subject, under discussion, of ticks and the evils resulting from their attack on animals, I have dealt fairly fully with the subject on other occasions. Tick paralysis is a disease of animals and is produced in human beings by the bites of ticks. In Cape Colony, South Africa, as well as in this country, ticks have been found to produce paralysis in sheep. Another record comes from Australia. Conditions of paralysis may be caused by several species of ticks, not always by the same one. Paralysis occurs several days after the tick has commenced its attack. During the first three or four days the tick remains quiet, but during the last twenty-four hours or so the engorgement is very rapid. In fatal cases the heart and respiration are affected. If the tick is removed, recovery is very rapid.

While there are about fifteen varieties of ticks in British Columbia, most of those which affect animals produce, not paralysis, but intense irritation to the tissues. It is remarkable that after a bite from almost any of the ticks, itching may continue for years. Severe constitutional disorders may result, and the ulcers which may form are very slow to heal.

In reference to the connection between ticks and animals, I have frequently heard it claimed that ticks prefer certain trees in which to stay. I am inclined to think that this is the case, and is caused by a preference on the part of the animals, after becoming laden with ticks in the pasture or range, to collect under some favourite tree for shade. Some animals are, as pointed out, more susceptible to ticks than others. I have noticed that weak animals are always affected the worst, but whether or not the weak condition is directly the cause of the attack I cannot say. Once an animal has a tick on it, you will find that a rag saturated with coal-oil will cause it to relinquish its hold. Any oil will work, but I acknowledge a certain difficulty in getting rid of ticks, especially on horses.

Mr. Parham: I haven't had very good success with oil.

Dr. Hadwen: You will find it will work, I am sure. A small drop even on the stigmal plate will cause a tick to relinquish its hold. It works every time. You can prove it for yourself in the laboratory.

Mr. Treherne: Is it so that "spotted fever" does not occur in British Columbia?

Dr. Hadwen: We have never heard of any case.

Mr. Parham: What about ticks on poultry?

Dr. Hadwen: I have never heard of poultry being affected by ticks. But if a chicken is affected with lice, it is advisable to dust thoroughly with sulphur. Any dusty substance kills them instantly. We have very few records of ticks taken on birds in this country.

Mr. L. E. Taylor: I found one on a bird on one occasion. Mr. Cockle in his paper mentioned about birds not seeming to like ticks, but I know of a team of oxen in South Africa which, when they got home at night, covered with ticks, the chickens would make their evening meal of the ticks on them. It was really an extraordinary sight to see the birds jumping up at the bellies of the oxen.

In South Africa arsenical dips for sheep are considered good things, despite the poison. I have seen the hair removed completely by dipping too many times. Up to a certain point dipping is fine. Donkeys are especially afflicted with ticks. One cure for ticks in South Africa is to apply a hot coal to the body. This causes the tick to loosen its hold. On other occasions a nearly full-gorged tick, if left on the body, will drop off naturally, with little evil results.

Dr. Hadwen: Deer in this country are often attacked by what are called "ticks," but they are not true ticks. At certain times they fly, and when they light on an animal they throw off their wings and live as body-parasites.

Mr. Wilson: When I was in India I got what was called a "black man's louse" on me, by sleeping too close to the natives.

Dr. Hadwen: That, of course, is due to the pigmentation of the skin from a negro. The species of the louse was the same as the "white man's louse."

Mr. Treherne: Mr. Cockle in submitting his paper attached a letter in which he mentions some interesting details. He mentions taking a very minute tick from a shrew, which is being sent to Washington, D.C., for determination. He has also added to his records of snow-insects by the capture of another species of "snow-flea," whose name he does not mention. The first specimens were taken on the snow when the thermometer registered 25° Fahr., actively walking. This is the lowest temperature that he has ever seen any insect-life active and alive. He has also discovered another small colony of golden snow-fleas in a locality different to any one known up to the present. It is to be hoped that Mr. Cockle will give us further information on this interesting form of insect-life on another occasion.

Mr. Blackmore (Vice-President): I will now ask Mr. Tom Wilson to give us his paper on the "Cottony Maple-scale."

THE COTTONY MAPLE-SCALE (*PULVINARIA INNUMERABILIS*).

By TOM WILSON, F.R.H.S.

The above-named insect has increased both in numbers and distribution during the past season to an almost alarming extent. It has been noticed in the City of Vancouver on a great variety of food-plants, such as thorns, poplars, grape-vines, willows, and gooseberries. At Agassiz, on maples and other plants. At Lytton, on *Acer glabra* and *Acer negundo*. Near Nanaimo, the willows out in the woods were attacked, as were also the maples, and the writer has had letters from many gooseberry-growers in various parts of the Province, sending in specimens of the affected twigs bearing the characteristic white cottony masses. We have not noticed them so numerous in the Province since 1899, when the thorn hedges and also currant-bushes around Chilliwack were all heavily infested. They almost disappeared the following year.

This insect is usually very inconspicuous in the early part of the year, but comes into notice after the females have attained their full growth in May or June, and have excreted a cotton-like substance, which protrudes from under the scale, covering the insect.

The entire under-surface of limbs is frequently covered by these insects, with their cottony filres full of minute eggs and young. The species is very prolific, and the late I. S. Putman, who published an exhaustive report on the insect, says that a female will lay from 500 and more frequently 2,000 eggs in the season. When the young leave the mother they establish themselves along the veins and usually on the under side of the leaves, sometimes on the upper side. It has been noticed that the young insects grow more rapidly on the under side than on the upper. The