

## THE PRODUCTION OF ARTIFICIAL CONDITIONS CONDUCTIVE TO WINTER FEEDING OF TICKS

(*Dermacentor andersoni* Styles)

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During the summer of 1934, at the Dominion Entomological Laboratory, Kamloops, B. C., large numbers of tick infestations were made on sheep. Of some hundred infestations seventy per cent engorged; the others died during their first few days on the host. All ticks that had once commenced to engorge completed their feeding at the end of a period averaging nine or ten days, at which time they dropped from their host.

Early in September the last infestation was made. The supply of ticks was running low, and the experiments for the year had been completed. This last tick which was placed on a sheep did not engorge, but remained alive and active for a period of over two weeks, at the end of which it was removed. Little attention was paid to the incident, as it was generally believed that the ticks were most active in the spring and gradually became feeble towards the fall.

In the late fall of the same year, at the University of Alberta, a small series of ticks from the same stock were placed on animals for the purpose of making studies during the feeding period. Contrary to all the summer infestation observations, with the exception of the last mentioned, these ticks failed to engorge.

Eight adults were placed on two domestic rabbits and on man at varying intervals during November and December. All ticks attached within a few hours, but remained unengorged at the end of six days, when they were removed. Their active state throughout this period and their occasional shifting to a new site to re-attach themselves suggested that their inability to engorge was due to some unfavourable physiological conditions present in the tick or host at this time of the year.

On December 14th. an experiment was begun whereby it was hoped that normal spring conditions would be produced in the host, presuming that it was the host alone that was responsible for the results already noted. \*

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\* For the suggestion of this experiment, I am indebted to Dr. Rowan, Dept. of Zoology, U. of Alta., who has recently obtained such startling results from his experiments with light on birds.

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A rabbit was subjected for a week to seven hours of light per day. Then gradually the artificial light was increased at the rate of ten minutes per day. At the end of one month a fresh tick was placed on the rabbit. It attached immediately and became replete at the end of two weeks. Two more adults were added. One unfed one did not attach for any length of time at one place until after a week, then engorging commenced. The other, one that had failed to engorge on man in November, attached within a period of two days and was engorged at the end of eighteen days.

Such remarkable results encouraged the making of one more test. A last tick was placed on an untreated rabbit. It attached. At the end of five days it was removed, totally unengorged but active, and placed under a dark capsule on the rabbit under continued light treatment. Water baths shielded it from heat generated by the electric light. By the fourth day it had permanently attached and engorgement was definitely observable.

Because of the shortage of ticks and time, these experiments have been too meagre to allow the drawing of any conclusions. The results, however, have been sufficiently remarkable to merit further investigations on a larger scale. These will be carried out under various conditions, and if successful, will naturally give rise to innumerable problems pertaining to artificially produced changes in the physiology of the parasite and host.