

the complicated life history of local species. His publications range from systematic and distributional, to faunal studies in entomology; Dr. R. E. Hardy of Utah State Agricultural College named a new insect species in his honour. Recognizing his wide experience and extreme precision, the Dominion Government employed him for two seasons especially to collect certain most-wanted and rare specimens for the National Museum at Ottawa. Leland Stanford University of California awarded him a fellowship to work under Dr. Gordon Ferris, the world's recognized authority in micro-entomology, and he was proceeding to California in 1939 when he became ill and had to enter hospital.

Kindly, unobtrusive, modest, Kenneth's hobby was playing classical music on the piano. He was better known in the scientific world than socially and he leaves his parents, Mr. and Mrs. R. S. Jacob of Vancouver, B. C., and a wide range of friends.

GEO. J. SPENCER.

HOST POISONING BY *IXODES CALIFORNICUS* BANKS. (Acarina, Ixodidae) *

J. D. GREGSON

Livestock Insect Laboratory, Kamloops, B. C.

Ixodes californicus Banks, sometimes referred to as the Coast Tick, is one of the three most important of British Columbia's ticks. It differs from the other two species in that the bite itself is often poisonous, quite apart from its disease transmitting potentialities. Lately, with the influx of new residents and their pets into fast-growing residential areas which are the habitat of *I. californicus*, records of poisoning from its bite have come regularly to Kamloops. Here at the Laboratory, studies of the life-history of this tick have shown that all stages may produce severe toxemia in host animals.

Persons who have been bitten by this tick very frequently experience a marked swelling of the area surrounding the bite. This inflammation may last for several days, and often causes considerable pain and discomfort. Of ninety replies to a tick-questionnaire sent from this laboratory to residents of West Vancouver, B. C., thirty made mention of such a reaction. The writer, while on a collecting trip, also experienced the marked effects of this poison; a tick attached itself to his arm and was there less than an hour before being discovered and removed. There was an almost immediate reaction, the arm swelling from the wrist to the shoulder, the discomfort becoming progressively more intense until it reached a peak forty-eight hours after the tick had been removed. Associated with the arm condition was a dull ache over the affected side of the body accompanied by a general feeling of malaise.

* Contribution No. 2124, Division of Entomology, Science Service,
Department of Agriculture, Ottawa, Canada.

In attempts to feed adult ticks at the laboratory, it has been found that a similar edema is produced on guinea pigs so that it is impracticable to use these animals as hosts.

Bites by this tick are often characterized by the formation of slow-healing ulcers at the site of the feeding puncture. These abscesses are usually suppurative and may persist as long as eighteen months, being very resistant to medical treatment. Even though it is probable that the detached mouth parts are responsible in the beginning for some of these ulcers, the severity of the following condition is much greater than might be expected merely from the introduction of a foreign body of the size of tick mouth parts, structures less than half a millimeter in length. Obviously the accompanying toxic irritant plays an important part in preventing, or at least delaying, the healing of bites.

It has been demonstrated at this Laboratory on a number of occasions that the two earlier stages of this tick, the seed or larvae and the nymph, are also poisonous to their hosts. As a rule, the larval progeny of a single tick will kill an adult guinea pig within five days of the infestation, while as few as seventy nymphs have killed one, though they succeeded in engorging only partially before the death of the host. Inoculations of the crushed ticks and the blood of the dead animals into fresh pigs have failed to produce any abnormal symptoms. In spite of the marked susceptibility of guinea pigs to the toxin of *I. californicus*, there are at present indications that an immunity is built up in the survivors of the initial infestations.

A SIMPLE METHOD OF ADDING OR CHANGING PRESERVATIVE LIQUIDS IN SEALED VIALS WITHOUT REMOVING THE CORKS*

E. R. BUCKELL

Field Crop Insect Laboratory, Kamloops, B.C.

Collections of insects or other material kept in preserving liquid in glass vials are a constant source of worry to the curator. This is particularly so when a volatile fluid such as alcohol is used.

The author has a collection of British Columbia dragonflies preserved in 95% grain alcohol and contained in about 2,000 glass vials. Homeopathic vials of several lengths with extra wide (16 mm.) mouths are used so that even the largest species are easily inserted or removed without injury. Short corks of good grade are best, the corks and necks being dipped several times in liquid wax. Other ways of preventing evaporation were tried but all had disadvantages of one sort or another and the waxed-cork method was adopted.

A dragonfly is an elongated insect, and there is not much space left between its head and the base of the cork in the vial. Therefore very little evaporation need take place before the insect's head and thorax becomes exposed to the air, making it desirable to add more alcohol. Examination of

* Contribution No. 2071, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada