

younger stages, and awaits there the chance passage of a host. This is the *third* host of the individual life-history. Once on the animal the female soon settles down in a favourable situation. If the host be a cow the escutcheon and neighbourhood of the udder will be perhaps the most favoured spots. The male is said to wander over the host and to stay there much longer than the female, but the writer is not prepared to say much concerning this sex until more numerous examples have been observed. The female takes, on an average, when the host is a cow, a week in which to engorge, the greater part of the swelling which makes her then so conspicuous taking place during the last few hours. She then drops to the ground and takes such shelter as may be convenient. Observations on this stage are of the utmost value in control work.

For about a fortnight the female lies as well concealed as possible while the blood engorged is digested and finally elaborated into the substance of the numerous eggs which she then commences to lay in an almost continuous stream. The process of egg-laying may take as long as three weeks. Upon its completion—her labours ended—the female dies. This completes the life-cycle.

It should be borne in mind that all the foregoing observations, which are mainly averages from large series, have been made under the conditions prevailing from February to July inclusive. There remains, however, to be considered a seasonal incidence in the life-cycle, which can be definitely worked out in detail only after a year's observations have been completed.

THE SEASONAL LIFE-CYCLE.

The relative abundance of the various stages during February, as gauged by sweeping them from seeding *paspalum* where they awaited hosts, was approximately 300 larvæ, 1 nymph, and 5 adults. This clearly indicates that, for the present year at any rate, February was distinctly a seed-tick period, where the seed-ticks were derived from adults which were extremely numerous in the preceding December. If February–March, then, could be considered a seed-tick period it became difficult to see how eggs, as popularly assumed, could be the wintering stage. Observations in the field showed that this heavy autumn infestation of larvæ had practically all left the hosts by the middle of April. On the ground moulting had taken place as usual, and the resulting nymphs were found in May wintering at the bases of the clumps of rushes or *wiwi* (*Juncus effusus*) which are such a conspicuous feature of the northern pastures—rendered all the more noticeable by the close winter grazing. The replete or full-fed larval stage is swollen, smooth, shining, and easily seen, and it must therefore be advantageous for the tick to spend the winter in the far less conspicuous nymph stage. Much of the *paspalum* which has served as such excellent harbourage for the seed-ticks in February–March is in winter eaten to a close turf. The rushes, however, remain as compact stiff clumps. In the larger paddocks a few clumps of seeding *paspalum* are found not yet eaten. The majority of the nymph ticks winter in the clumps of rushes an inch or two above the surface of the ground. The overwhelming number of other wintering arthropods (insects, spiders, woodlice, and their allies) in the bases of these rush clumps, as compared with those in the shorter grass and in