

becomes distended to its utmost capacity, takes on an average about a week, but depends to a certain extent on the position on the host. It is obvious that some portions of the animal might be pierced to better advantage with regard to blood-supply than others. Engorgement proceeds very much more rapidly towards the end, and the replete or full-fed larva disengages its mouth-parts from the skin of the host and drops to the ground.

For about three weeks, on an average, the shining-black full-fed larvæ lie upon the ground, hidden among the bases of grass and weeds near where they fell from the host. Early in that period the shining-black appearance is displaced by a misty almost mouldy look, due to the shrinking of the nymphal or next stage tissues from the distended and still stiff larval cuticle or "skin." At the end of the period the larval cuticle splits, and a pale-coloured nymph tick emerges.

The Nymph or Second Stage.

The nymph, although not so small as the larva, is still minute, and much less conspicuous than the replete larva from which it emerged. It may, however, be distinguished from the larva by the possession of four pairs of legs, as in the adult tick. After a longer or shorter period—at most a day—the nymphs, like the young larvæ, ascend herbage and thus reach a host—the second host of the individual life-history. Most of the remarks concerning the behaviour of larvæ on horses and cattle respectively apply also to the nymphs. Their period of heaviest infestation is, however, as will be shown in the account of the seasonal cycle, at a different time of the year. Both larvæ and nymphs attack almost any portion of the host, except where the latter happens to be a bird, when the head, for reasons of safety, becomes almost the sole point of attachment.

For a week or perhaps a little longer the nymphs suck the blood of the host until they are engorged. Then, like the larvæ, they drop to the ground and lie hidden among rubbish and vegetation, while the internal changes resulting in the conversion of the nymphal tissues and the engorged blood into the structures of the adult tick are consummated beneath the passive exterior. In about three weeks from the time of dropping to the ground the nymphal cuticle splits, and the adult tick, at first pale and rather soft, clambers out.

The Adult.

The adult is eventually of a deep rich-brown colour, the female rather larger than the male, but both quite flat and out of all comparison less bulky than the engorged female which corresponds to the farmer's more familiar conception of a cattle-tick. In this unfed state it is a matter of some difficulty to distinguish the sexes with the naked eye, but the vast majority are females. The males so far have proved very rare indeed. The males feed but little, and never engorge as do the females, so that the former sex keeps approximately the aspect of the female before she has commenced to feed. For this reason unfed females have been repeatedly taken for males and recorded as such.

As soon as possible after leaving the old nymphal slough and hardening its own integument the adult tick climbs herbage just as did the