

unlike those of most Nematoceran genera, live entirely, and continually, below the surface of the water, they are apneustic, and all of the oxygen they require has to be extracted from the water through three supra-anal finger-like gills. The relatively small size of these accounts, in all probability, for the necessity of these larvæ living in fast flowing water, for when they are placed in still water they soon die, presumably of asphyxiation.

In maturing larvæ the histoblasts of the pupal and adult organs are well developed and most conspicuous. Thus on each side of the thorax can be seen the three leg-, the wing-, and the halter-histoblasts, as distinctly limited whitish areas. The pupæ of these flies resemble the chrysalids of the Heterocera with the exception of having all the spiracles closed, and the respiratory function being accomplished by a tuft of respiratory filaments situated on each side of the prothoracic region. These project far out of the slipper shaped cocoon in which the pupal stage is passed. The histoblasts of these filaments turn black in the later stages of larval development, and when the latter assumes the chestnut brown colour of maturity they appear as a black triangular area on each side of the prothorax.

The commonest Simuliid around Boston, in Spring, is *Simulium hirtipes*. In the larva of this species two classes of parasites occur. One of these is represented by a nemathelminth worm, belonging to or near the genus *Mermis*. The worm lives either singly, or in considerable numbers, coiled up within the body cavity of its host, where it occupies the ventral portion of the somewhat swollen abdominal region (Pl. XV, fig. 1). When one worm only is present it measures about three centimetres, which is nearly three times the length of its host. The greatest number of worms found in a single larva was twelve. In this case none attained to a greater length than 1 cm. The most striking effect of these parasites upon their larval host is that they so far inhibit the development of the histoblasts that pupation becomes impossible (fig. 2). This suppression of pupal and adult organs is accompanied by a slight increase in the size of the larval tissues, for most parasitised larvæ were from 2 to 3 mm. longer than their healthy companions. This condition is opposite to *Prothetely*, which name Kolbe ('03) ascribed to the several recorded cases in which larvæ of various orders had their