

class. It explains why insects, after they have attained their imago state, and the circulation is nearly obliterated, no longer increase in size, and require but little nourishment for the maintenance of life. This, however, is a state not calculated for so long a duration as that in which the development is advancing; and, accordingly, the period during which the insect remains in the imago condition is generally short, compared to that of the larva, where a large supply of nutriment, and a rapid circulation of the fluids, concur in maintaining the vital functions in full activity. Thus, the Ephemera, which lives for two or three years in the larva state generally perishes in the course of a few hours after it has acquired wings, and reached its perfect state of maturity.

which is equal to about one-third of that of the aorta; they descend, one on each side of the mouth, and are each divided into three branches. The second set consists of two pairs of branches, one going apparently to the tongue, the other to the antennæ. The third set is formed by two branches, which pass upwards, and are the continuations of the aorta; they divide into branches, and are lost in the integuments, and structures of the anterior part of the head.

The pulsatory action of the dorsal vessel is continued along its whole course, and seems to terminate at the division of the vessel into branches. During the metamorphosis of the insect, this vessel becomes considerably shortened, but is stronger and more consolidated in its structure. Its course is likewise altered; from having, in the caterpillar, (Fig. 339,) passed along, nearly in a straight line, it begins in the chrysalis, (Fig. 340,) to descend in the fifth segment, and to pass under what is to become the division between the thorax and abdomen in the perfect insect. It then ascends in the fourth segment, and descends again in the second, so that when the insect has attained its perfect form, (Fig. 341,) its course is very tortuous. The vessels which enter it are situated in the abdomen, and pass in laterally among the muscles, chiefly at the anterior part of each segment or valve. Fig. 342 is a superior, or dorsal view of the same vessel, in the perfect state of the insect, which shows, still more distinctly, the vessels entering it laterally, intermixed with the lateral muscles. Fig. 343 is a magnified lateral view of the anterior extremity of the dorsal vessel, corresponding to Fig. 341; and Fig. 344, a similarly magnified view of the same portion of the vessel seen from above, corresponding to Fig. 342. Fig. 345 shows the mode in which the valves are formed by a duplicature of the inner membrane in the perfect insect.