

Important, however, as cilia are, in adult stages of the animals referred to, they are not of inferior importance to the newly hatched young. Sponges, starfishes, zoophytes, jellyfish, worms, etc., pass through a ciliated larval condition, with rare exceptions, and the cilia as in the active Infusorians aid in progressive locomotion.

It might appear that in the highest animals, provided with special limbs for locomotion and with complicated respiratory and digestive organs, there is no necessity for cilia. It is not so. They are often of importance in the Vertebrates, although sometimes they may be found to persist, when the necessity for them has apparently gone. Thus *Amphioxus*, the lowest of fishes, possesses a ciliated skin, in the young condition. Larval lampreys, too, exhibit delicate hairs upon the external integument, a remnant no doubt of the ciliated condition, though the hairs are now rigid. The usefulness of such cilia and bristles is difficult to discover. Similarly, the cilia which line the gullet in newly-hatched fishes, such as the haddock, have no doubt merely an ancestral meaning. No food passes down the gullet, for the creature is mouthless and subsists by absorbing the contents of the yolk-sac. The cilia soon disappear, though in many Vertebrates, such as the frog, the mouth, throat, air-passages, stomach, etc., are ciliated through life. Nor are they absent from the highest animals, but even in man, they occur in the nasal passages, the respiratory tubes, certain auditory canals, the secretory ducts in the tongue and many organs, the ovarian passages, and other cavities; but their use now appears mainly to be the expulsion of matters hurtful to the sensitive epithelial surfaces referred to. The central canal in the human spinal cord is lined by ciliated cells in childhood, but these cells are obliterated later. We thus see how important is the part played by these minute and insignificant organs. They are efficient for locomotion, they aid in securing food, they assist in excretion, they act protectively by driving hurtful matters away.

It remains to briefly describe cilia and their mode of action. A cilium is simply a thread like continuation of the protoplasmic cell to which it is attached. Its base, under the highest microscopic powers, differs optically from the tip; but practically the cilium is merely a