but openly continuous below with the long pedal gape. The exhalant siphon lies directly behind, being closed below by fusion of the mantle margins, these projecting above it to give the appearance of a large triangular tentacle.

*The mantle cavity*: The disposition of the organs of the mantle cavity (Fig. 2 b) was studied to ascertain the structure of the gill and the direction of the ctenidial and cleansing currents. A full description of the pallial organs and other structures will be given in a later paper, presenting an anatomical account of certain New Zealand leptonaceans.

The gill consists of two demibranchs of which the inner one is by far the larger, and has both ascending and descending lamellae, and the outer, no more than a third the size of the inner, having a descending lamella only, with its ventral edge fused to the inner surface of the mantle. Just below the exhalant aperture, both demibranchs narrow to a point and are fused to the mantle. The ascending lamella of the inner demibranch is fused along its whole length to the visceral mass. The free margin of the inner demibranch carries a food groove. The closed cavity, triangular in section, between the outer demibranch and mantle, and the space between the ascending and descending lamellae of the inner demibranch, are used as broad pouches. This is an arrangement commonly seen in the Leptonacea. The ciliation of the ctenidium is straightforward and follows the normal leptonid pattern (Popham, 1940). Guarding cilia occur along the food groove on the inner demibranch. Cilia sweep particles on the outer demibranch up its inner face into a dorsal groove between the two demibranches. It then passes to the palps along the anterior edge of the gill. On the inner demibranch particles are swept down both inner and outer faces to the ventral food groove. Tufts of guarding cilia on the edge of the descending lamella prevent the larger particles entering the groove. These very long cilia do not beat rapidly, the only movement being a slight vibration. The labial palps are conspicuously larger than those described by Popham (1940) for some other species in the Leptonacea. The sorting mechanism differs from the other species in certain details. It consists of two main series of cilia on each palp, one found on the crests of the numerous ridges and the other in the grooves between the ridges (Fig. 3). The outer palp has ridges on its inner face only, and particles are swept across these towards the mouth. The inner palp has orally directed cilia on the ridges on the outer face and, unusual among bivalves, posteriorly directed cilia on its inner ridges. On both faces cilia in the grooves sweep heavy particles to the outer palp, where they are passed down the grooves on that structure to its edge, and from there are rejected on to the mantle where they are passed posteriorly. Cilia on the lips carry food into the mouth. Large particles are sometimes dislodged from the palps by flicking motions which occur intermittently.

The cleaning cilia of the visceral mass are poorly developed and the mantle is hardly ciliated except in the groove inside the thickened marginal lobe (Fig. 2b and 3) where there is a strong rejection current running posteriorly carrying the mucus-bound waste from the palps to a point at the end of the pedal opening. Sometimes this well-developed rejection tract is marked by a ridge on the mantle edge. Weaker outward rejection occurs around the entire mantle edge bordering the inhalant pedal aperture. There does not seem to be any ciliation of the mantle edge at the exhalant aperture. Occasionally, when large particles become lodged in the inhalant siphon, the adductors contract forcing water back through this aperture and so removing the obstruction. Often mucus-bound waste is expelled in this manner from the posterior portion of the mantle cavity. The foot has a posteriorly directed cleansing current along the lower part of its lateral region. Cilia on the ventral anterior portion beat upwards to meet this tract.