

In the gill of *Malletia* (Pl. I. fig. 8) we no longer see the binary character of typical Pelecypoda (except Tellinacea, Lucinacea, and Anatinacea). The branchial axis (containing the two afferent and efferent vessels, and fixed to the visceral sac and to the dorsal side of the mantle), as in *Nucula* and *Yoldia*, bears lamellæ (or large branchial filaments) on each side, *but in the same longitudinal plane*. Here, as also in *Nucula*,<sup>1</sup> the lamellæ or filaments of one side make an obtuse angle with the plate formed by the lamellæ of the other. In the allied forms, *Arca*, *Pectunculus*, *Limopsis* (Pl. II. fig. 2), the two plates formed by the filaments are parallel, and almost touching each other; that is, they exhibit the typical binary arrangement of the gills of Pelecypoda.

On the other hand, the gill of *Malletia* has all its lamellæ or filaments in the same plane, right and left of the axis, and it presents an aspect similar to that of the gill of Cephalopoda and Gastropoda (*Fissurella* and *Haliotis*). The gill of *Malletia*, therefore, well represents a primitive gill, from which all the gill-forms of the Pelecypoda may be derived by successive specialisation.

The great development of the labial palps, and the presence of appendages to these organs, in *Malletia* and all Nuculidæ, is in direct correlation to the structure of the gills. These do not form the large plates, with ciliated surfaces, which play so large a part in nutrition, by conveying the food towards the mouth in the currents which they produce. The gills being exclusively respiratory organs, and having nothing to do with nutrition as they have in other Pelecypoda, the latter function is performed by the palps alone, and it is therefore quite natural that they should be so greatly developed.

What can be seen, without dissection, of the rest of the structure agrees with that existing in *Yoldia*.

2. *Yoldia isonota*, von Martens. Kerguelen Island; 95–110 fathoms.

I have used this species to compare with *Malletia pallida*. The structure of the genus *Yoldia* being better known, I shall confine myself to pointing out the following facts:—

The branchial siphon (inhalent) is not open ventrally.

The siphonal tentacle (probably osphradium) is placed sometimes to the right, sometimes to the left. The presence of pallial tentacles, properly so called (on the posterior edge of the mantle), does not appear to be constant.

Finally, the gill (as in other species of *Yoldia* already studied) is less simple than that of *Malletia*, the lamellæ being more numerous and more closely pressed together; that is to say, they already resemble in their arrangement those of *Nucula*.

<sup>1</sup> Mitsukuri, *loc. cit.*, pl. xxxiv. fig. 5.