

margin. The oblique ribs in *Penæus* commence near the margin and divide at a certain distance, and after a space again subdivide and terminate at the margin where a single hair articulates with every rib at its extremity. The intermediate spaces between the longitudinal ribs are occupied by strong muscles, and those formed by the marginal ribs are occupied by vessels that communicate with the hairs which fringe the inner margin of the scaphocerite; those on the outer side are upon the under surface, on the inner side of the ribs, whence they probably receive their nourishment.

This plan is best observable in *Hemipenæus* (Pl. L.), in which the circulating vessels are seen to traverse the appendage longitudinally in two lines, and to ramify over the surface in numerous capillaries that are traceable to the small direct lines leading to the marginal hairs. The joint on which the scaphocerite stands is the largest of the second pair of antennæ, and its dimensions show the importance of this appendage in the economy of the animal. Its purpose I take to be chiefly to balance the animal in a vertical position when swimming, but it appears also to be useful in folding over and enclosing or hugging objects against itself, and which may account for a condition that is met with in some specimens, the hairs being lost and the margins thickened as if diseased by much friction. In some this is increased to a larger extent than in others, and sometimes is accompanied by a constriction of the margin (fig. c.) that is suggestive of a permanent variation in form. On the inner distal angle in *Penæus* there is a tubercular process, which in other genera, as *Benthesicymus*, is developed into a hook with a blunt extremity, and its apex is lodged in a depression on the inner surface of the first pair of antennæ; in those species in which the process is sufficiently developed to be unciform, there is a hollow above, in the ridged structure of the under side of the stylocerite, that does not exist in those species where the process is present only as a tubercle. This hook-like process, which may conveniently be named the "ancecerite,"<sup>1</sup> enables the animal, by the assistance of the powerful muscles of the second pair of antennæ, to hold the first pair down more firmly than it otherwise could. In *Penæus*, where this structure exists only as a tubercle, the animal does not roll itself up as it does in *Benthesicymus*, in which the external tissues are soft, and consequently have less protection.

The three succeeding joints of the peduncle are small, and only important as being the carriers of a long and slender flagellum, that in some genera, as *Aristeus*, is three or four times as long as the animal, a feature that appears to be common to those forms obtained from very great depths.

The mandibles in all the *Penæidæ* are large and powerful organs; the external portion consists of an incisive margin, which is generally smooth or but slightly dentate, and beneath it a broad, circular, molar tubercle; when the incisive margins meet there is a space between them and the molar tubercles that is occupied by a process from a fleshy mass that overlies them anteriorly. The posterior process of this mass fulfils the

<sup>1</sup> ἀγκή, a hook.