

pair of pereopoda, where they are usually small and sometimes rudimentary. They exist attached to all the pereopoda except the posterior, and are four in number. The arthropoda are similarly persistent, those attached to the anterior appendages being less developed than those situated posteriorly. There are eight in all—four anterior and four posterior plumes. There are also four pleurobranchiæ, but these are implanted between the somites above the four posterior pereopoda, the last being the only plume connected with the posterior pair of pereopoda. There are none above the first pair.

The branchial arrangement therefore differs from that of the Scyllaridæ, Palinuridæ, or Astacidæ.

In the posterior division or pleon the several appendages have a tendency to vary but little, but that little appears to be fixed and reliable. The most conspicuous and convenient feature for observation exists in the arrangement of the large dorsal median elevation. In *Polycheles crucifera* every somite except the first and last has two large teeth, one before the other.

In *Stereomastis suhmi* there are also two, but the posterior is much smaller than the anterior. In *Pentacheles obscura* there are also two on each somite, but these take the form of tubercles rather than teeth. In *Pentacheles auriculata* the teeth on the third and fourth somites are very long and slender; in most of the others they are more regular, but vary in number and proportion. Throughout all the species they are invariably directed forwards, a feature that is rare in other forms, and is suggestive of the idea that the animal normally creeps backward.

The first pair of pleopoda (Pl. XIV. fig. 1 *p*, ♀) is small, slender, and feeble in the female; in the male (fig. 2 *p*, ♂) it is large, strong, and well developed, evidently adapted for a sexual purpose. It is spatuliform and slightly curved, with the convex part towards the ventral surface of the pereion. The broad and curved blade lies anterior to the coxa or first joint of the posterior pair of legs (Pl. XIX. *p* ♂, *o*), so that the vas deferens, when projecting as it is capable of doing to a considerable extent (Pl. XV. fig. 3 *o*, ♂), falls upon the concave surface of the spoon-like pleopod, and is evidently held by it and directed against the ventral surface of the female, where its extremity rests in contact with or near the vulvar opening. That it does not enter the passage of this latter organ may be assumed from the circumstance that the foramen through which the vas deferens projects on the fifth pair of legs is much larger than that of the female on the third pair. We may

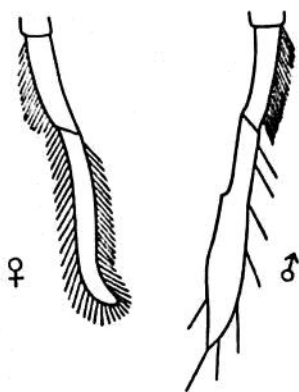


FIG. 25.—First pair of pleopoda, male and female, $\times 4$, of *Pentacheles euthriz*. From a drawing by Willemoes-Suhm.

therefore assume that the first pair of pleopoda conducts the extended vas deferens to its position and holds it there. This pleopod is the incipient representative of that organ which we see in the Brachyura, holding the vas deferens in an enclosed tube, and fulfilling the office of an intromittent organ.