

It is almost impossible to determine the homotypical relation of the several joints in comparison with those of the true Crustacean leg, but it appears to me that the two inner branches belong to the coxa and basis, and that the external branch is an ephysis of the second joint.

These five pairs of appendages belong to the great dorsal shield, and are the true cephalic appendages, the following pairs belonging to the pereion.

*The Second Siagnopoda.*—The second pair of siagnopoda is large, variable in form, situated on the outer side of the first pair, but a little behind it, and planted at the anterior exit of the branchial chamber. It generally consists of three or four branches, two of which are short, broad, and foliaceous, while the third is cylindrical and rod-like, and one is long, broad, and membranous.



FIG. XIII.—Second Siagnopod.

The first joint is generally broad and short, the inner margin being thickly fringed with ciliated hairs; this joint I take to be the homologue of the coxa of the theoretical leg. The second joint frequently resembles the first in form and general appearance and is similarly furnished with hairs, but it is usually bilobed, and the marginal hairs are simple; the third branch is short and cylindrical, and tipped with one or two hairs; on the outer side is the broad and membranous plate that I take to be the homotype of the mastigobranchial plate of the pereiopoda; it is liable to vary in form and size, but that belonging to *Spirontocaris spinus* is illustrative of the most normal type (Pl. CVII. fig. f).

In *Homarus* this pair of appendages consists of three branches or joints, of which the two inner are double and foliaceous, the outer being single and tapering. In *Astacus* the same conditions exist, but there is added on the outer side a broad and leaf-like plate of semi-membranous character, and this I believe is the homotype of the mastigobranchia attached to the pereionic appendages.

In *Stenopus* and *Spongicola* this appendage is formed on the same plan, but in these two genera the outer plate or mastigobranchia is produced posteriorly as well as anteriorly, but is ciliated most abundantly on the anterior margin.

Passing on to the Dendrobranchiata we find this latter condition continued, but the anterior branches are shorter and broader, as in *Penæus*, *Sergestes*, and *Sicyonia*; the first and third branches having a tendency to become rudimentary.

In the Phyllobranchiata the same structure exists, but with a greater variation of parts. The first joint generally carries the branch on the inner side, although as in *Athanas* and *Alpheus* it may be seen only in a rudimentary condition; the second joint is bifid as among the Trichobranchiata, but differs somewhat in form, being deeply