

large, pointed, and situated at the posterior angle of the cutting edge, but at the second Protozoa stage a number of small denticles have appeared in front of the long one. The mandibles are never quite symmetrical, but the outline of the left always differs a little from that of the right," as shown in the following illustration from Willemoes Suhm's drawings.



FIG. 55.—Mandibles of *Lucifer*.

The first pair of maxillæ consists of a basal portion made up of two joints with "cutting hairs," an inner ramus of two joints terminating in three slender hairs, and an outer ramus with three. In the first stage the hairs of the latter are simple, but on the second they are plumose.

The second maxilla consists of a multiarticulate basal portion, a small biarticulate inner ramus, and a uniarticulate outer branch. The entire inner margin of the appendage carries short stout hairs; the extremity of the inner ramus carries a few somewhat longer, and the outer branch three slender plumose hairs, which are much longer in the second than in the first stage.

The next succeeding appendages, which Professor Brooks calls the first and second pairs of maxillipedes, but which are homologous with the last or third pair of siagnopoda and the first pair of gnathopoda according to the nomenclature in this Report, resemble each other and consist of a two-jointed basal portion, a four-jointed inner, and a single-jointed outer ramus, the former supporting four long slender hairs which are simple in the first pair but regularly ciliated in the second. The second pair is smaller than the first, and apparently of little functional importance. Professor Brooks here notices "a small convoluted shell-gland which appears to open at the base of the first maxilla."

In Suhm's figure of the earlier stage of this Zoa there is represented a small gland (fig. 54, *gl.*) of a similar character, but situated on the outer side in a line with the mandibles, whereas Professor Brooks describes it as being at the base of either the first or second maxilla, he is not sure which, because "the constant and violent movements of the limbs renders it difficult to decide with confidence exactly what its relation to them is."

After the next moult, which Professor Brooks has observed in a great number of specimens, the Zoa passes into a form that is directly comparable, so far as the appendages are concerned, with the *Elaphocaris*-stage of *Sergestes*,<sup>1</sup> although the most conspicuous features, the long compound spines, are not present in the young of *Lucifer*. It is now about  $\frac{5}{1000}$  of an inch (or 1.25 mm) long; the appendages are the same, but the four pairs of pereopoda and the appendages of the sixth somite of the pleon are present as rudimentary buds. The permanent eye is now well advanced in development, although there is yet no trace of a peduncle, the cornea being simply a modified portion of the

<sup>1</sup> It should be remembered that *Elaphocaris suhmi* has yet no trace of the permanent eye, and Suhm asserts, and his drawing confirms the opinion, that the specimen when he captured it still contained in abundance the cells of the embryonic yolk-mass, a circumstance that strongly suggests that the youngest form of *Sergestes* is a Nauplius in the form of a blind *Elaphocaris*, and therefore earlier in development than the Protozoa of *Lucifer*.