

comparison of the two groups is a totally hypothetical one. At present this comparison is based upon the homology of the appendages, which homology is as yet quite uncertain.

Taking into consideration that the metamorphosis of the third and the fourth pairs of appendages of the Nauplius-larva into the mandibles and into the maxillæ has not been observed, and attaching more importance to the observations of Metschnikoff and v. Willemoes Suhm, who contend that the third pair of appendages has been lost, the latter saying, moreover, that the three pairs of gnathites are new formations;<sup>1</sup> considering, besides, that there is in most genera of Cirripedia a very distinct separation between the first and the second pair of cirri, the first standing very close to the mouth, and being of a very characteristic form, the latter being much more like the four remaining pairs,—I feel inclined to propose a comparison totally different from that of Claus. There are in a full-grown Cirriped three pairs of gnathites, and originally each of them represents a pair of appendages belonging to a distinct segment of the body. These appendages appear after the metamorphosis into the Cypris-larva has taken place, and then are placed between the three pairs of true Nauplius-appendages, and the so-called fourth pair of Claus.<sup>2</sup> This latter pair, is then really the seventh pair, and develops into the first pair of cirri. Not only in that case would this first pair of cirri correspond to the second pair of rowing-feet of the Copepoda, but we should also have in that part of the Cirriped-body, which in the adult is placed before the second pair of cirri, a part corresponding to the Metanauplius of the Copepoda. The five remaining pairs of cirri are—like the gnathites—not visible in the Nauplius-stage, when studied immediately before the metamorphosis into the Cypris-stage. They represent the appendages of the eighth to the twelfth segments of the body, and therefore may be considered as homologous with the thoracic feet of the Malacostraca. The abdomen of the full-grown Cirripedia is rudimentary; the only pair of appendages of this division is the pair of caudal appendages.

Though I believe that my hypothesis in many respects is more in accordance with the facts than that of Claus, yet in one point it is quite similar, viz., that it is based on the premise that the Nauplius-larva of a Cirriped and of a Copepod are homologous. This premise is so generally admitted that it seems almost ridiculous to doubt its truth. Yet we must not forget that the conformity of the two larval forms is by no means complete. The so-called "frontal threads" of the Cirriped-Nauplius are wanting in that of the Copepoda; the shell glands (antennal glands) of the second pair of appendages of the

<sup>1</sup> If the second pair of appendages has been lost, there is no reason why the third pair should not have shared the same fate. Of course in that case the mandibles of Copepoda and Cirripedia are not homologous parts; but I believe even Claus (*loc. cit.*, p. 81) does not attach, *a priori*, so much importance to this homology, as to accept it so long as it has not been proved by facts.

<sup>2</sup> The three pairs of gnathites are placed so close to one another as to appear to be attached to the same segment of the body. This, however, cannot be the original condition, and is to be considered as a falsification, in consequence of an abbreviation of the developmental process.