

both sexes. End of abdomen produced, with a deep groove below; the mesial lobe large, sub-triangular, its lateral walls bent downwards, so that the longitudinal groove is continued on the lower side of the process, while the two teeth—in *Cymodoce* constituting the lateral limits of the notch—are situated on the lower margins of abdomen at the base of the process, and quite invisible from above.)

(9) *Bregmocerella* (Hasw.).

The genus *Cassidinella* (Whitelegge), which is unknown to me, belongs probably to this section; in the following chapter it is mentioned in the treatment of the genus *Cymodoce*, and discussed as the tenth genus of the hemibranchiate *Sphærominæ*.

Group B. *Sphærominæ eubranchiatæ*.

This group comprises as many genera as group A, but the number of species is much less. Mouth-parts—excepting the metamorphosis in the females of several genera—and pleopods are very uniform in all points of importance; the end of abdomen is at least a little emarginate (*Cassidinopsis* (n. gen.)), but otherwise with a real notch or a tube or foramen connected by a slit with the end itself. The basal joints of the antennulæ afford sometimes a fine generic character. The thoracic legs are always simple, the two anterior pairs without prehensile hands, and in no case has any special equipment with natatory setæ or any sexual difference been observed; the strong thickening of some pairs in *Amphoroidea* is the most noteworthy feature discovered. In some genera, containing animals of moderate or considerable size, the rami of plp.⁴ and plp.⁵ are thick, of fleshy aspect, while they are thinner in small forms, but in all species the folds are well developed. An articulation on exp. of plp.⁴ could generally not be perceived, but it is very distinct in *Scutuloidea*; exp. of plp.⁵ is generally divided rather near the end, but this articulation is not always easily observed; this exp. has three bosses, two of which on the

second joint, but while the largest of them, which is a high protuberance, is situated on the lower surface of second joint, the others vary as to place. The arrangements for the brood differ greatly in various genera.

The character used for dividing all the genera of the group into two portions, viz. the absence or existence of an articulation of exp. of plp.³, is certainly practical, but scarcely very important; the two portions arising from this division can scarcely be considered natural sections. But on the other hand, it is impossible to give a better division, because at least three genera—*Cymodocella* (Pfeff.), *Amphoroidea* (M.-Edw.), and *Cassidinopsis* (n. gen.)—are not very closely allied either to each other or to the other genera. For these reasons I do not attempt to sub-divide this group into sections with names, while such division is most natural in the two other groups of the sub-family.

a. Exp. of plp.³ unjointed. (Not seen in *Næsicopea*, but this genus is closely allied to *Dynamene*.)

(a) Basal joint of antennulæ of usual shape, not expanded in a free plate.

(†) Urp. always with an exp. at least half as long as endp. and sometimes (in males) very elongate.

(§) Male with a pair of processes from sixth thoracic segment, its abdomen with a circular foramen (sometimes situated on a low cone) connected with the end by a short narrow slit; uropods have exp. much longer than endp.; no appendix masculina on endp. of plp.² Female without processes, abdomen with a foramen connected with the end either by a slit which is only somewhat narrower than, and not marked off from, the foramen, or by a quite linear slit; rami of urp. lamellar, subsimilar in length; mouth-parts exceedingly metamorphosed, marsupial lamellæ exceedingly large and the brood in the marsupium itself.

(1) *Dynamene* (Leach) (*Næsa* (Leach)).

(§§) Both sexes without processes on thorax, but the last abdominal segment with two blunt "processes situated one

behind the other"; the end of the posterior one, situated considerably above and a little beyond the end of abdomen, bears the respiratory circular foramen which is connected with the end by a long linear slit; urp. has exp. in both sexes styliform, narrowing towards the acute end, in the male more than twice as long as endp., curved, in the sub-adult female a little longer than endp., straight.¹

(2) *Næsicopea* (Stebb.).

(§§§) Both sexes rather similar in aspect, without real processes; abdomen with a notch which is semicircular or oblong in the female, in the male narrow in the distal part, while the proximal part constitutes a transverse foramen; urp. sub-similar in both sexes, with the rami lamellar. Mouth-parts similar in both sexes; male with appendix masculina on endp. of plp.²; marsupial lamellæ overlap each other somewhat, but the propagation is unknown.

(3) *Dynamenella* (n. gen.).

(§§§§) Both sexes similar, without processes. Distal part of abdomen somewhat produced, with the lateral walls bent strongly downwards and inwards, constituting a rather long tube open at both ends and with a slit on the lower surface; urp. similar in both sexes, rami lamellar, exp. considerably shorter than endp. Mouth-parts similar in both sexes; male with appendix masculina on endp. of plp.²; marsupial lamellæ overlap each other somewhat; the brood in an exceedingly large external pouch and in the marsupium.

(4) *Cymodocella* (Pfeff.).

(††) Urp. without exp., but endp. large, lamellar. Both sexes similar, without processes; end of abdomen with a semi-circular notch. Mouth-parts similar in both sexes; marsupial lamellæ overlap each other considerably, and the brood is developed in internal pouches.

(5) *Scutuloidea* (Chilt.).

¹ The diagnosis is deficient, because mouth-parts and pleopods had been removed before my examination from the two specimens hitherto known, a female with rudimentary marsupial lamellæ and a male.

(β) Basal joint of antennulæ expanded, protruding as an exceedingly large, free, horizontal, angular plate in front of the head. Both sexes similar, without processes; end of abdomen with a semicircular or triangular notch; urp. with the rami well developed, lamellar. Especially fourth, fifth and sixth pairs of thoracic legs short and very thick, much thicker than the anterior pairs. Mouth-parts similar in both sexes; marsupial lamellæ as in *Scutuloidea*, but the propagation unknown.

(6) *Amphoroidea* (M.-Edw.).

(b) Exp. of plp.³ with an articulation rather near the end.

(a) Head of normal size. Basal joint of antennulæ has its distal posterior angle produced into an acute process lying close to the hind margin of second joint. Abdomen with a well-developed notch. Exp. of urp. about as large as or much larger than endp.

(†) Male without any mesial process on sixth thoracic segment. Female with the abdominal notch semicircular, the mouth-parts strongly metamorphosed (the mandibles coalesced with the head).

(§) Male has paired denticles in the abdominal notch, urp. strongly altered, with exp. very elongate, curved. Female has the brood in internal pouches.

(7) *Paracerceis* (n. gen.).

(§§) Male has a mesial lobe, but no paired denticles in the abdominal notch; urp. not much altered, their exp. straight. Female carries the brood in the marsupium itself.

(8) *Cerceis* (M.-Edw.).

(††) Male with a large mesial process on sixth thoracic segment. (Female unknown.)

(9) *Haswellia* (Miers).

β . Head small, narrow in proportion to largest breadth of thorax. Basal joint of antennulæ without process from the distal posterior angle. End of abdomen feebly emarginate.

Uropoda similar in both sexes; endp. laterally expanded, very much broader and a little longer than exp. Both sexes similar, without processes; female with normal mouth-parts and the brood in internal pouches.

(10) *Cassidinopsis* (n. gen.).

Group C. Sphærominæ platybranchiatæ.

This group is sharply defined from the two preceding ones, but its twelve genera show much variation, not only in general aspect, but in several structural features. It is, however, not necessary to produce here a more detailed account of the differences, because the group is divided into four sections which are natural and sharply limited by a set of characters, and a perusal of the diagnoses of these groups may convey a sufficient idea on the points essential. It may be added that the arrangements for the development of the brood differ strongly in the sections, but the mouth-parts seem never to be metamorphosed in the female.

It is an interesting fact that some of the genera of the eubranchiata Sphærominæ comprise three or four and some of the hemibranchiate genera a large number of species, but each of the platybranchiate genera comprises at most two and the majority only one species hitherto described. Most of the genera are, besides, very rare in collections.

The characterisations of the four sections are given before the diagnoses of the genera in order to facilitate comparison.

(a) Section *Campecopeini*.—Body rather vaulted; thorax and abdomen not expanded laterally, without any row of short hairs on the lateral margin. Eyes well developed. The two proximal joints of the antennulæ fitted in excavations on the head and not expanded plate-like in front. Mandibles with the masticatory process well developed. Anterior pairs of legs without prehensile hands. Endp. of plp.¹ at most somewhat longer than broad. Both rami of plp.³ with long plumose setæ on their distal margin; exp. two-jointed. Plp.⁴ and plp.⁵ subsimilar in aspect, with their rami respiratory;

rami of plp.⁴ naked or with a few very short terminal setæ. Abdomen terminates in a notch (sometimes visible only from below). Marsupial lamellæ overlap each other somewhat at the mesial line.

(b) Section Monolistrini.—Body rather vaulted; thorax and abdomen not expanded laterally, without any row of short hairs on the lateral margin. Eyes wanting. The two proximal joints of the antennulæ fitted in excavations on the head, not expanded plate-like in front. Mandibles with the masticatory process well developed. First pair of legs simple; second pair in the male terminating in a prehensile hand. Endp. of plp.¹ very narrow, more than three times longer than broad. Both rami of plp.³ and of the following pairs without marginal setæ; exp. of plp.³ unjointed; endp. of all three pairs opaque, respiratory, while exp. is vitreous and at least not so well adapted for respiration. Abdomen without notch, posteriorly broadly rounded. Marsupial lamellæ very large; the brood in the marsupium itself.

(c) Section Cassidinini.—Body much or exceedingly depressed; thorax considerably or strongly expanded; margin of thorax, anterior part of abdomen, uropods and sometimes the two proximal joints of antennulæ constituting a nearly continuous border ciliated with a less or more conspicuous rim of short protruding hairs. Eyes well developed. The two proximal joints of the antennulæ with the anterior part protruding, visible from above in at least almost their whole length, frequently much expanded in front, depressed. Mandibles with masticatory process well developed. Anterior pairs of legs without prehensile band. Endp. of plp.¹ at least somewhat longer than broad, sometimes very narrow. Both rami of plp.³ with several plumose setæ on the terminal margin; exp. unjointed or two-jointed. Both rami of plp.⁴ and plp.⁵ without setæ, subsimilar in aspect, respiratory. Posterior margin of abdomen short; a real notch always wanting. Marsupial lamellæ wanting; the brood in a chamber formed by two external pouches (see p. 80).

(d) Section Ancinini.—Body depressed; thorax some-

what or considerably expanded, but a rim of marginal hairs feebly developed or wanting. Eyes at least discoverable. Antennulæ vary as to shape and insertion, but never fitted in excavations on the head. Mandibles without masticatory process.¹ First thoracic legs with a robust prehensile hand in both sexes; second legs in the female ambulatory, in the male terminating in a prehensile hand differing much in shape or size from that of first pair. Endp. of plp.¹ broader than long. Endp. of plp.³ with a few short terminal setæ, exp. with numerous long setæ. Exp. of plp.⁴ with or without marginal setæ; both rami of plp.⁵ without setæ. End of abdomen truncate or less or more triangular. Marsupial lamellæ overlap each other very considerably (at least in one of the genera, *Ancinella*, the brood is developed in an enormous external pouch and in the marsupium).

The section *Campeopeini* comprises two genera.

(a) Epistome considerably longer than broad, protruding in front as a rounded process visible from above. Second and third thoracic legs show peculiar sexual differences (see the notes below). Endp. of plp.¹ broader than long; endp. of plp.³ nearly as broad as long; exp. of plp.³ with the articulation rather near the end; endp. of plp.⁴ with a few very short terminal setæ. Urp. with both rami well developed. Marginal portion of abdomen visible from above. Last thoracic segment unarmed in both sexes. (Brood in internal pouches.)

(1) *Parasphæroma* (Stebb.).

(β) Epistome much broader than long, without any free frontal process, not visible from above. Second and third thoracic legs not showing sexual differences. Endp. of plp.¹ somewhat longer than broad; endp. of plp.³ much longer than broad; exp. of plp.³ with the articulation near the middle; endp. of plp.⁴ naked at the end. Urp. with exp. elongate and endp. wanting. Marginal portion of the wall of abdomen bent not only downwards but much inwards, not visible from above.

¹ Of the genus *Ancinus*, (M.-Edw.). I have only examined a dried specimen from the outside, but having dissected specimens of the two other genera, I think it allowable to draw up this diagnosis of the section.