

(Dana), both originally referred to *Sphæroma*. *Sphæroma integrum* (Hell.) may perhaps be an *Isocladus*, but more probably it is a species of *Zuzara* (Leach).

(5) *Zuzara* (Leach).—According to my examination of types in the British Museum and animals received from Dr. Chilton, *Zuzara semipunctata* (Leach), *Z. diadema* (Leach), *Z. integra* (Hasw.), and *Cycloidura venosa* (Stebb.) belong to this genus, while *Zuzara emarginata* (Hasw.) must be referred to the genus *Haswellia* (Miers). *Sphæroma integrum* (Hell.) is probably a species of *Zuzara*, perhaps an *Isocladus*; *Cymodoce armata* (M.-Edw.) has been transferred to *Zuzara* by Haswell, but this reference seems to me to be rather dubious.

(6) *Cymodoce* (Leach).—This genus, *Cilicæa* (Leach) and *Cilicæopsis* (n. gen.) are very closely allied; *Cassidinella* (Whitelegge), which is imperfectly described as to one of the most important features and unknown to me, belongs probably to the *Cymodocini*, and if so it is scarcely distinguishable from certain forms of *Cymodoce*. The male of *Cymodoce*, *Cilicæa*, and *Cilicæopsis* are easy to separate, but the females of *Cymodoce* cannot be distinguished from those of *Cilicæa*; in adult females of certain species of *Cymodoce* the mesial lobe of the notch is scarcely distinguishable, and the notch therefore rather similar to that in *Cilicæopsis*, but the females of the latter genus differ in aspect from those of *Cymodoce* and have the end of the exopod of urp. produced and very acute, a feature not observed in *Cymodoce*. It might perhaps have been advisable to cancel *Cilicæa* and not to establish *Cilicæopsis*, thus including all species of hemibranchiate *Sphærominæ* possessing an abdominal notch—*Bregmocerella* excepted—in the genus *Cymodoce*. But, on the other hand, it is always difficult to suppress a genus as a mere synonym, when it comprises a certain number of species, and is allied to another very rich genus: if *Cilicæa* be suppressed the genus *Cymodoce* will be extremely large. When *Cilicæa* is maintained it is necessary to establish *Cilicæopsis*, and in the future two or three new genera of similar quality must be erected.

But after the removal of *Cilicæa* and *Cilicæopsis* the genus *Cymodoce* comprises still a very good number of species described in the literature, and, according to my experience, numerous undescribed species from the Indian Ocean and the Pacific (from Japan to Australia) are found in various European collections. I propose, therefore, to accept *Cilicæa*, and consequently to establish *Cilicæopsis*, but to consider both these genera—and probably *Cassidinella*—as having only sub-generic value.

The genus *Cymodoce* and its sub-genera are exceedingly difficult to deal with. The difference between adult species of the two sexes is generally very large; the adult males are adorned with tubercles, bosses, or processes, which are wanting or low in the females; when a mesial lobe is present the abdominal notch differs considerably in shape in the two sexes; finally, the uropods show nearly always striking sexual differences. In the females the rami of the uropods are plate-shaped, often nearly similar in size and shape, but sometimes the exp. is rather small, in rare cases even very small; in the male the exp. is frequently elongate, sometimes very long, while the endp. either has preserved the same size as in the female and immature specimens, or has been reduced in size, or is even quite rudimentary. Several females or immature specimens have been established as species of *Sphæroma*, while the males were described as forms of *Cymodoce* or *Cilicæa*.

From the coasts of England, France, Italy, and Tripoli I found in the British Museum animals belonging to the genus *Cymodoce* labelled with the following names: *C. truncata* (Leach), *C. Lamarchii* (Leach), *C. emarginata* (Leach), *Sphæroma Dumerilii* (Leach), *Sph. Ritchianum* (Leach), *Sph. Prideauxianum* (Leach), *Sph. curtum* (Leach), *Sph. Griffithsii* (Leach), *Sph. tridens* (Spinola), *Sph. spinosum* (Risso), *Cymodoce spinosa* (White); furthermore, H. Milne-Edwards establishes *C. pilosa* from the Mediterranean. But at least *C. truncata* (Leach), *S. Dumerilii*, *S. Prideauxianum*, *S. curtum*, *S. Griffithsii*, *S. tridens*, and *S. spinosum* belong to the same species,

for which I—at least provisionally—apply the name *C. truncata* (Leach); some specimens of *S. Ritchianum* and one of the specimens of *C. Lamarchii* belong besides to *C. truncata*, while other specimens referred to the two last-named forms are identical with *C. pilosa* (M.-Edw.); on *C. emarginata* (Leach) I shall not express an opinion. *Sphæroma Lesueuri* (Risso) has been transferred to *Cymodoce* by M.-Edwards, and I suppose it to be correct; it is probably an immature specimen of one of the Mediterranean species. Gourret has established two species from the Mediterranean of *Dynamene*, *D. corallana*, and *D. setosa*, but according to the shape of maxillipeds and abdominal notch, they are females of *Cymodoce*. I am acquainted with three European species, but the sum of these statements shows that it will be a most difficult task to name them correctly, and an attempt must be postponed.

In the British Museum I saw besides typical specimens (or co-types) of the following species correctly established as forms of *Cymodoce*, viz. *C. bifida* (Leach), *C. trilobata* (Miers), *C. longistylis* (Miers), *C. convexa* (Miers), *C. aculeata* (Hasw.), *C. coronata* (Hasw.), and *C. granulata* (Miers). (The last-named form is similar to *Cerceis trispinosa* (Hasw.) in the shape of first joint of the antennulæ, surface of thorax and abdomen, shape of seventh thoracic epimera, which are produced and curved as a hook with the apex turning upwards, shape of the abdominal notch and uropoda, but it differs sharply from *Cerceis trispinosa* in the structure of plp.,⁴ and certainly of plp.⁵: according to kind communication from Dr. W. T. Calman—who at my request examined several details of a male from Flinders Isl.—the exp. of plp.⁴ is sub-membranaceous, not plicated as in the named species of *Cerceis*, of which I have examined specimens from Port Victoria forwarded me by Dr. Chilton.) In the same Museum I saw the type of *Sphæroma spongiosum* (White) and specimens of *Sphæroma Gaimardii* (M.-Edw.), both referred correctly to *Cymodoce* by Miers. *Cymodoce abyssorum* (Bedd.) has with good reason been

established by Stebbing of the type for a new genus, *Næsicopea*, which belongs to the eubranchiata *Sphærominæ*. Among the species not seen by me, *Cymodoce tuberculosa* (Stebb.), *C. uncinata* (Stebb.), and *C. bicarinata* (Stebb.) have been correctly referred. *Cym. armata* (M.-Edw.) has been transferred to *Zuzara* by Haswell, but this reference is, in my opinion, rather dubious, though I cannot offer any better interpretation. Above it is mentioned that *Exosphæroma validum* (Stebb.) and *E. setulosum* (Stebb.) are respectively the young male and the female of a species of *Cymodoce*. *Exosphæroma amplifrons* (Stebb.), of which I have inspected a fine typical specimen kindly forwarded me by Mr. Stebbing, is the male of an interesting species of *Cymodoce*; in the shape of the terminal part of abdomen it is much alike to *Bregmocerella*, but it differs from this genus and agrees with *Cymodoce* as to the number of spiniferous protuberances on exp. of plp.⁵, and the exp. of urp. is as large as the endp. Judging from the descriptions in the literature Haswell has correctly referred *Sphæroma pubescens* (M.-Edw.) to *Cymodoce*, and above it is mentioned that *Sphæroma granulatum* (M.-Edw.) and *S. yucatanum* (Richardson) must be transferred to the same genus. Of the other forms established in the literature as species of *Cymodoce*, *C. bidentata* (Hasw.), *C. tuberculata* (Hasw.), and *C. inornata* (Whitelegge) belong probably to this genus, while *C. bermudensis* (Ives), according to my examination of specimens from the U. S. National Museum, is the female (and immature male) of a species of *Paracerceis* (n. gen.) (belonging to the eubranchiata *Sphærominæ*). *Cilicæa linguicauda* (Richardson) is probably, *Cil. granulosa* (Richardson) perhaps, a species of *Cymodoce*; both differ from the other species of the last-named genus in having the endp. of urp. very short. The description of *Cymodoce cordiforaminalis* (Chilton) I have not seen, but judging from the name the species can scarcely belong to the present genus.

(7) *Cilicæa* (Leach).—The type is *C. Latreillei* (Leach).

Specimens in the British Museum of *Cil. crassa* (Hasw.) and *Cil. tenuicaudata* (Hasw.) show that these species have been correctly referred; according to Haswell's descriptions of the abdominal notch, the same is the case with *Cil. crassicaudata* (Hasw.), *Cil. hystrix* (Hasw.) and *Cil. curtispina* (Hasw.), while I am unable to decide whether *Cil. spinulosa* (Hasw.) belongs to *Cilicæa*, or to the following sub-genus *Cilicæopsis*. The three species established by Whitelegge as belonging to *Cilicæa* are dealt with under *Cilicæopsis*. According to the examination of specimens forwarded me by Dr. Chilton, *Næsa canaliculata* (Thoms.) belongs to *Cilicæa*. On the other hand, *Cilicæa caudata* (Say) (originally established as a *Næsa* by Say, but referred to *Cilicæa* by Harriet Richardson) and *Cilicæa caudata* (Moore) are species of *Paracerceis* (n. gen.); *Cilicæa caudata* Gilliana (Richardson), and *C. cordata* (Richardson) are certainly also species of *Paracerceis*.

(8) *Cilicæopsis* (n. gen.).—As the type I take *Cilicæa granulata* (Whitelegge); from the East Indian and Australian regions I have seen some unnamed species more or less allied to that form. Whitelegge describes and figures two aberrant species established on males, *Cilicæa stylifera* (Whitel.), and *C. ornata* (Whitel.), which differ strongly from *C. granulata* (Whitel.) as to the shape of the upper side of abdomen, but agree with it in possessing a semicircular abdominal notch and rudimentary endp. of urp., while exp. of urp. is extremely elongate; I think that these two species can be referred to *Cilicæopsis*, but without an examination of any of them, or, at least, of closely-allied species, I cannot decide the question.

(9) *Bregmocerella* (Hasw.).—Only one species, *B. Grayana* (Woodw.), is known; it has been described by Woodward, Haswell, Beddard, and Whitelegge, and figured by the two first-named of these authors. It is in reality, in spite of its aberrant aspect, closely allied to *Cymodoce*. To the characters pointed out on pp. 104, 105, may be added that exp. of plp.⁵ has not only the three usual protuberances, but besides a protuberance at the inner margin somewhat before

the end of the first joint; this protuberance is wanting in even very large species of *Cymodoce* examined for comparison. The shape and number of the entrances to pouches with brood are mentioned on p. 76.

(10) *Cassidinella* (Whitelegge).—This genus has been established on a single male specimen. In the diagnosis the author writes: "Pleopoda foliate; all except the last pair densely ciliate." If that be correct, the genus must belong to the platybranchiate *Sphærominæ*, and besides disagree with these as to plp.⁴; according to the sentence quoted plp.⁴ and plp.⁵ would even agree with those in *Limnoria* and differ from all *Sphærominæ*. But his eight figures of the typical species, *C. insisa* (Whitel.), show an animal which is rather alike to two unnamed forms seen by me and belonging to *Cymodoce* (sens. lat.); in reality, antennulæ, mandibles, maxillipeds, thoracic legs, and end of abdomen do not show any difference; exp. of urp. is several times smaller than endp., but in one of the species alluded to the exp. is still smaller; the upper surface of abdomen has no processes, but this character is of slight value, and processes are, besides, not found in males of all species of *Cymodoce*. Judging from these facts, I insert *Cassidinella*, at least provisionally, on this place.

B. *Sphærominæ eubranchiatæ*.

(1) *Dynamene* (Leach) (*Næsa* (Leach¹)).—The type is *D. bidentata* (Mont.). Leach established the genus *Næsa* on the adult male of this species, while *D. viridis* (Leach), *D. Montagui* (Leach), and *D. ruber* (Mont.) are the female and immature specimens of the same species; above it is mentioned that *Sphæroma gibbosum* (M.-Edw.) and *Sphærominæ micracanthum* (Tristan) are young males of *Dynamene*, probably even of *D. bidentata*. Hesse established (1873) nine new species of *Næsa* from the western coast of France, but they are probably all unrecognisable and are

¹ As to the synonymical question on the use of either *Dynamene* or *Næsa* for the present genus, I refer to the footnote on p. 77.

omitted here. Gourret established (1891) on females two new species of *Dynamene*, viz. *D. corallana* and *D. setosa* from the southern coast of France, but according to kind information from the zoological authorities at the Museums in Marseille his typical specimens could not be found; judging from the shape of the maxillipeds and the abdominal notch, the animals are females of the genus *Cymodoce*, and the descriptions and figures given by him will scarcely allow recognition of the species. It may be added that I am acquainted with males and females of two fine species from the Mediterranean; one of these constitutes as to the situation of the respiratory foramen to a certain degree a transition stage to the genus *Næsicopea* (Stebb).

Of exotic species referred to *Næsa* no one belongs to the present genus. *Næsa caudata* (Say) I take as the type for the genus *Paracerceis* (n. gen.); *Næsa ovalis* (Say) is my type for *Cassidinidea* (n. gen.) belonging to the platybranchiate *Sphærominæ*; *Næsa canaliculata* (Thoms.) is, as mentioned above, a species of *Cilicæa* (Leach); *Næsa depressa* (Say) is the type for the genus *Ancinus* (M.-Edw.). Of exotic species referred to *Dynamene* scarcely any one can remain in this genus. *D. Eatoni* (Miers), established on immature animals, seems to be a species of *Dynamenella*. According to kind information from Dr. Calman, *D. Darwinii* (Cunningham) has exp. of plp.³ divided by an articulation; the species must, in my opinion, be established as a new genus near *Paracerceis*. *Dynamene perforata* (Moore) I establish as the type for *Dynamenella* (n. gen.); *Dynamene bermudensis* (Ives) is, according to my examination of specimens from the U. S. National Museum, females of a species of *Paracerceis* closely allied to *P. caudata* (Say); *Dynamene angulata* (Richardson), *D. Benedictii* (Richardson), and *D. glabra* (Richardson) are probably females and immature specimens either of *Dynamenella* or *Paracerceis*, but as the structure of the pleopods, etc., is unknown it is, of course, impossible to refer them to genera with certainty. On *D. tuberculosa* (Richardson) I have no