

XVIII.—*Contributions to the Study of the Entomostraca.*
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No. VIII. *On Marine Copepoda taken in the West of Ireland.*

[Plates VIII. & IX.]

THE following notes embrace the chief results of our work amongst the marine Copepoda during three visits to the coasts of Galway and Mayo. Had these little creatures been the primary object of attention, the list would doubtless have been very much longer. In addition to our own collections we have been favoured with some interesting gatherings made by means of the surface-net, off the coast of Ireland, by Mr. E. C. Davison, to whom our best thanks are due. Our notes have been considerably enriched from this source.

Fam. Calanidæ, Dana.

Subfam. CALANINÆ, Dana.

Genus CALANUS, Leach.

(*Cetochilus*, Roussel de Vauzème.)

Calanus finmarchicus (Gunner).

Abundant in the open sea and between tide-marks.

Genus PARACALANUS, Boeck.

(*Calanus*, Claus.)

Paracalanus hibernicus, n. sp. Pl. VIII. figs. 1-3.

Antero-inferior angle of the cephalothorax slightly produced. Anterior antennæ of male and female alike, slender, a little longer than the cephalothorax, thick at the base and tapering gradually to the extremity, twenty-five-jointed; the nine basal joints (except the first, which is very large) broader than long, the succeeding joints being from twice to thrice as long as broad, except the terminal one, which is very short; each joint bears on its outer margin one or two short setæ; and the seven or eight proximal joints are produced into a short median spine or tooth; the last joint has one long and two small setæ; the penultimate, one very long seta. Both branches of the posterior antennæ stout, and nearly equal in size, densely setose at the apex. Mandibles strong, with a largely developed palp. Maxillæ and upper maxillipeds stout, and densely beset with marginal setæ. Lower maxillipeds tapering, slender, and bearing fine plumose setæ. Swimming-feet having the inner

branch very short, about half the length of the outer branch, the last joint of which is very long and truncate at the apex; marginal and terminal spines very small. The fifth feet in both sexes are cylindrical and one-branched; in the male four- and in the female three-jointed, those of the *female*, however, being much shorter than those of the male, and having joints of nearly equal length terminated by two or three fine short setæ. In the *male* the first and fourth joints are much elongated, the foot of one side being swollen, and bearing a long, slender, curved process. Abdomen of female four-jointed (including caudal segments), first joint equal in length to the second and third. Caudal setæ scarcely equal in length to the last three segments. Length * $\frac{1}{10}$ of an inch.

Taken plentifully in the open sea in several places off Ireland: off the mouth of the Shannon; Galway Bay; off Loup Head; Dingle Bay; near Valentia; Rockall Bank; in lat. $51^{\circ} 22' N.$, long. $12^{\circ} 25' W.$, and lat. $53^{\circ} 24' N.$, long. $15^{\circ} 24' W.$

Genus PSEUDOCALANUS, Boeck.

(*Clausia*, Boeck, 1864.)

Pseudocalanus elongatus, Boeck.

Abundant in the open sea and in tide-pools.

The generic term *Clausia* has been recently (1872) withdrawn by M. Boeck, it having been previously applied by Claparède to a genus of parasitic Copepoda. M. Boeck proposes instead the name *Pseudocalanus*.

Genus DIAS, Lilljeborg.

Dias longiremis, Lilljeborg.

Abundant in the open sea and between tide-marks.

Genus TEMORA, Baird.

Temora longicornis (Müller).

Occurring very abundantly in the open sea as well as in tidal pools.

Genus ISIAS, Boeck.

Isias clavipes, Boeck.

On the fronds of *Laminariæ* in Clifden and Roundstone Bays. Rare.

* The measurements are in all cases exclusive of the tail-setæ.

Genus CENTROPAGES, Kröyer.

1. *Centropages typicus*, Kröyer.

Frequently taken in the surface-net in the open sea, but never in any great abundance.

2. *Centropages hamatus* (Lilljeborg).

Taken in similar situations to the foregoing, and often in company with it.

Genus PSEUDOCYCLOPS, Brady*.

Forma *Cyclopi* similis: antennæ anticæ mediocres, multiarticulatæ, *maris* dextra in medio tumefacta non geniculans; antennæ posticæ parvæ biramosæ; mandibularum palpus biramosus; maxilla et maxillipedes iis *Paracalani* fere similes; pedes quinti paris *fœminæ* biramosi, *maris* complexi, laminati, spinosi.

Though distinctly Cyclopid in general appearance, this curious genus, like the *Misophria* of M. Boeck, exhibits a distinct affinity to the Calanidæ in the structure of its mouth-apparatus: this, taken in conjunction with the biramose second antenna and the structure of the fifth pair of feet in the female, has induced us to transfer it to the position it here occupies.

M. Boeck thinks that this genus belongs to the male of his *Misophria*; but in this opinion we are unable to agree. Of the species described in a previous paper, *Pseudocyclops crassiremis*, it is true that we found only the male; but of that here noticed we have taken many specimens, both male and female. From *Misophria* the genus is clearly distinguished by several characters, notably the following: the basal joint of the secondary branch of the posterior antenna is excessively broad and truncate, the succeeding joint or joints being very narrow, and the fifth foot in the female is distinctly two-branched, each branch being triarticulate.

Pseudocyclops obtusatus, n. sp. Pl. VIII. figs. 4-7.

Cephalothorax very tumid, obtusely rounded in front down to the rectangular and almost obsolete rostrum; dorsum strongly arched; first segment very large, nearly equal in length to half the cephalothorax; abdomen slender, in the male five-, in the female four-jointed. Anterior antennæ eighteen-jointed, stout, and about equal in length to the first cephalothoracic segment; basal joints (except the first) extremely short, gradually increasing in length to the terminal joint, which is twice as long as broad, closely beset on the

* Ann. & Mag. Nat. Hist. 1872, vol. x. p. 7.

anterior margin with hairs of moderate length; right antenna of the male swollen in the middle, but having no true hinge-joint: posterior antennæ four-jointed, with a large biarticulate secondary branch springing from the basal joint. Mandible-palp large, having a uniarticulate secondary branch. First four pairs of swimming-feet stoutly built, with short setæ and broad marginal lancet-shaped spines; branches subequal, tri-articulate; the setæ of the inner margins are peculiar, consisting of short, slender, abruptly truncated rods, from the extremities of which spring solitary short hairs. Fifth pair in the female having the inner branch very short, and beset with a few short transverse rows of minute setæ; those of the male largely developed, each formed apparently of two modified three-jointed branches, the outer branch on each side forming a strong terminal spine, and on the left (?) having also a very large falciform claw; the remaining processes form a number of irregularly lacinated plates. Abdominal segments short; caudal segments scarcely twice as long as broad; the longest tail-seta about equal in length to the abdomen. Length $\frac{1}{3}$ of an inch.

P. obtusatus was taken, but in no great numbers, by the surface-net in Roundstone Bay, on a moonlight night in July 1871.

Subfam. *PONTELLINÆ*.

Genus ANOMALOCERA, Templeton.

Anomalocera Patersonii, Templ.

Often in great abundance in the open sea.

Genus PONTELLA, Dana.

Pontella brevicornis, Lubbock.

Taken sparingly in the surface-net in Westport Bay and Kinsale Harbour; also amongst *Zostera* and other weeds near low-water mark in Westport and Clifden Bays.

Fam. *Cyclopida*.

Genus CYCLOPS, O. F. Müller.

Cyclops æquoreus, Fischer.

In a pool near high-water mark, south of Clifden.

Genus THORELLIA, Boeck.

(? *Euryte*, Philippi, Wiegmann's Archiv, 1843.)

Thorellia brunnea, Boeck.

Taken sparingly in the surface-net in Westport and Ventry
Ann. & Mag. N. H. Ser. 4. Vol. xii.

Bays and in Kinsale Harbour; also on the fronds of *Laminaria saccharina* in Clifden Bay.

We can scarcely doubt that this genus is identical with Dr. Philippi's *Euryte*; but, considering the somewhat vague definition and figures given by that author, we should not feel safe in discarding M. Boeck's more recent generic name.

Genus OITHONA, Baird.

Oithona helgolandica?, Claus.

Of not uncommon occurrence in surface-net gatherings: Westport Bay, Kinsale Harbour, near Valentia, off the Skelligs.

We are not satisfied that the species referred to here, as well as in the previous list of the Copepoda of the north-east coast of England, is really identical with any of those described by Claus, Boeck, and other authors; but the differences appear to be so small that we are unwilling to run the risk of proposing another specific name, not having had the opportunity of examining undoubted specimens of the previously described forms.

Fam. Harpactidæ.

Genus LONGIPEDIA, Claus.

Longipedia coronata, Claus.

In rock-pools, Great Isle of Aran; and on *Laminariæ* in Clifden Bay, where it was also dredged on a gravelly bottom in a depth of four fathoms.

Genus ECTINOSOMA, Boeck.

Ectinosoma melaniceps, Boeck.

In rock-pools, Great Isle of Aran.

Genus MICROSETELLA, nov. gen.

Corpus angustissimum, fere lineare, antice attenuatum; fronte arcuata, appendicibus falciformibus carente. Antennæ anticæ breves, tenues, articulo tertio appendicem gerentes; antennæ posticæ ramo secundario præditæ. Partes manducatoriæ omnes perminutæ; maxillipedes posteriores perbreves, uncinati. Pedes natatorii tenues, elongati; quinti paris foliacei. Seta caudalis longissima.

Microsetella atlantica, n. sp. Pl. IX. figs. 11-16.

Body not unlike *Ectinosoma* in general shape, somewhat

curvate, tapering before and behind. First segment of the cephalothorax attenuated, nearly equal in length to the following five segments. Anterior antennæ slender, five-jointed, sparingly setose; posterior antennæ comparatively large, three-jointed, the first joint bearing a long secondary branch. The mouth-organs are all extremely small, and similar in structure to those of the Harpactidæ generally; lower maxillipeds having an ovate hand terminated by two (?) slender claws. Four pairs of swimming-feet long and slender, having both branches three-jointed and of nearly equal length; fifth pair with three very long and three smaller setæ. Caudal segments very short, each bearing two principal setæ, one of which is short, and the other as long as the body of the animal. Length $\frac{1}{6}$ of an inch.

Taken in the surface-net by Mr. E. C. Davison in the open sea as follows:—lat. $53^{\circ} 24'$ N., long. $15^{\circ} 24'$ W.; lat. $53^{\circ} 15'$ N., long. $11^{\circ} 51'$ W.; lat. $51^{\circ} 22'$ N., long. $12^{\circ} 25\frac{1}{2}'$ W.; and at 40 miles off the Skelligs.

This very minute species appears to differ from *Setella* chiefly in the absence of the double falciform rostrum, described as belonging to that genus by both Dana and Claus, and in the presence of a secondary branch of the lower antenna. The mouth-organs are so excessively minute and crowded together that we have not been able fully to examine the mandibles, nor even to find the maxillæ at all. The mandibles probably have a palp, though we have not seen it.

Genus EUTERPE, Claus.

Euterpe gracilis, Claus.

A few specimens taken in the surface-net in Kinsale Harbour by Mr. E. C. Davison.

Genus PARATACHIDIUS, nov. gen.

Corpus lineare, rostratum. Antennæ anticæ breves 7-articulatæ, apud marem appendicem vesiculiformem gerentes, apicemque unguiculatæ; antennæ posticæ parvæ, ramo secundario minuto bi-articulato. Mandibulæ maxillæque iis *Tachidii* fere similes. Maxillipedes anteriores parvi, 3-digitati; posteriores 4-articulati cheliformes. Pedum quatuor parium priorum rami interni 2-, externi 3-articulati; paris primi ramus internus magnopere elongatus. Pedes quinti paris foliacei. Sacculus ovifer unicus.

Paratachidius gracilis, n. sp. Pl. VIII. figs. 8-16.

Body slender, resembling *Tachidius* in general appearance. Anterior antennæ of the female seven-jointed, having a small

flagelliform appendage; that of the male much swollen, the last joint forming a sort of claw in front of the large vesiculi-form swelling. Mandibles bearing a small one-branched (?) palp. Second pair of maxillipeds setose on the anterior margin, terminating in a long and slender claw. Inner branch of the first pair of swimming-feet nearly twice as long as the outer, its first joint longer than the entire outer branch; second joint short. Fifth pair of feet well developed, biarticulate in the female; in the male uniarticulate, much broader, rounded and fringed with shorter and stronger spines. Length $\frac{1}{3}$ of an inch.

This species was taken plentifully in a pool above high-water mark on the shore south of Clifden in Connemara.

Genus IDYA, Philippi.

(*Tisbe*, Lilljeborg.)

Idya furcata (Baird).

Extremely common in littoral situations on weeds; also taken in the surface-net in sheltered bays.

Genus WESTWOODIA, Dana.

1. *Westwoodia nobilis* (Baird).

On weeds in Ventry Bay, taken by Mr. E. C. Davison.

2. *Westwoodia minuta*, Claus.

Dredged in Westport Bay; rare.

Genus ILYOPSYLLUS, nov. gen.

(*ἰλύς*, mud; *ψύλλος*, a flea.)

Corpus tumidum, gibbosum. Antennæ anticæ brevissimæ, appendicem ensiformem gerentes, 5-articulatæ, parte basali magnopere dilatata; antennæ posticæ validæ, ramo secundario carentes. Mandibulæ parvulæ, palpo simpliciter bisetosus. Pedes primi paris valide armati, ramo interno 1-, externo 3-articulato; sequentium parium rami ambo 3-articulati. Abdomen breve, versus extremitatem attenuatum; setæ caudales spathulatæ.

Ilyopsyllus coriaceus, n. sp. Pl. IX. figs. 1-5.

Body very tumid; seen laterally the ventral line is almost straight, the dorsal excessively arched, so that the cephalothorax forms almost a semicircle; seen from below, the outline is like that of a spear-head rounded off in front; greatest width situate in the middle, and equal to half the entire length of the body; posterior half abruptly tapered. First cephalothoracic segment very large, forming half the length of the

animal. Anterior antennæ five-jointed, sparingly setose, very minute, the basal joint excessively dilated and produced anteriorly into an overlapping hood-like beak; posterior antennæ simple, biarticulate (?), the second joint armed with six strong spines, one of which is very long. Mandibles extremely small, with a small bisetose palp. First pair of feet short and thick: internal branch one-jointed, and bearing two strong terminal spines, one longer than the other; external branch three-jointed, bearing at the truncated apex of the last joint two spines similar to those of the inner branch, and also two very long curved setæ: second, third, and fourth pairs of feet having both branches triarticulate and nearly equal, more slender than the first pair, each joint bearing at its apex a subverticillate series of sharp slender spines. Abdominal segments beset round the posterior margins with fine spine-like setæ, the last two cut into rectangular notches. Caudal segments very small, each bearing one large and two small setæ, the larger ones curved, their anterior halves dilated and spathulate. Colour dark vinous red; skin excessively thick and tough. Length $\frac{1}{5}$ of an inch.

The habitat of this remarkable species is amongst the black peaty mud of the upper end of Roundstone Bay, near high-water mark. It is to be regretted that the specimens were not noticed until after the mud in which they were taken had been completely dried; had we been able to preserve them in spirit it is possible that more accurate knowledge of the mouth-apparatus and some other organs might have been obtained. As things stand we have been unable, with the most careful dissection, to find any trace of maxillæ or maxillipeds except (doubtfully) of a very feeble posterior maxilliped, neither have we seen any trace of a fifth pair of feet. The remarkably short and thick limbs of this little creature, together with its flattened ventral surface, its short, stout, and dilated tail-setæ, and general absence of delicate setose encumbrances, seem to fit it admirably for the sort of locality in which it was found, to which and similar situations it is probably exclusively confined.

Genus HARPACTICUS, Milne-Edwards.

1. *Harpacticus chelifer* (O. F. Müller).

On weeds in Westport Bay, Valentia Harbour, and in brackish pools near Clifden.

2. *Harpacticus fulvus*, Fischer.

Frequent in pools at and above high-water mark: coasts of Galway and Great Isle of Aran.

3. *Harpacticus flexus*, n. sp. Pl. IX. figs. 17-21.

Anterior antennæ rather short and stout, eight-jointed, first four joints in the female of nearly equal length, last four also subequal and less than one half the length of the preceding; anterior antennæ of the male short and stout, joints coalescent, so as to form four only, terminating in a large vesiculiform swelling: second antennæ having a minute biarticulate branch. Posterior maxilliped small; hand elongated, oval, with a slender, gently curved terminal claw. First pair of feet not materially different from those of *H. chelifera*, but more slender; fifth pair of feet in both sexes broader than in *H. chelifera*; third pair of feet in the male, as in all other species of this genus, largely developed and armed with very strong spines. Body suddenly bent forward at the junction of thorax and abdomen. Length $\frac{1}{40}$ of an inch.

Taken in the surface-net in Westport Bay; moderately plentiful.

We at first thought this might perhaps be a young form of some better-known species; but the uniform size of the specimens, the different proportions of the antennal joints, and the form of the posterior maxilliped point it out as entitled to distinct specific rank.

Genus ZAUS, Goodsir.

Zaus spinosus, Goodsir.

On weeds in Ventry Bay: dredged by Mr. E. C. Davison.

Genus ALTEUTHA, Baird.

1. *Alteutha oblonga* (Goodsir).

Carillus oblongus (♀), Goodsir, Ann. & Mag. Nat. Hist. vol. xvi. (1845), pl. xi. figs. 12-15.

? *Sterope interruptus* (♂), Goodsir, loc. cit. pl. xi. fig. 10.

Alteutha bopyroides, Claus, Die frei-lebend. Copepod. p. 143, Taf. xxii. figs. 10-17.

Taken commonly all round the British Islands in the open sea. Both males and females occur in surface-gatherings; but females with ova we have only rarely found, and those always in dredgings from several fathoms depth.

2. *Alteutha purpurocineta*, Norman.

On the fronds of *Laminaria saccharina* in Clifden Bay.

Genus ASPIDISCUS, Norman.

Aspidiscus fasciatus, Norman.

On *Laminariae* in Clifden and Ventry Bays.

Genus SCUTELLIDIUM, Claus.

Scutellidium tisboides, Claus.

Two specimens taken on weeds in a rock-pool in Clifden Bay.

Genus THALESTRIS, Claus.

1. *Thalestris harpactoides*, Claus.

Taken in the surface-net: Roundstone Bay, Ventry Bay, Killybegs.

2. *Thalestris mysis*, Claus.

In the surface-net, Westport and Roundstone, and on the fronds of *Laminariæ* at Clifden.

3. *Thalestris helgolandica*, Claus.

On the fronds of *Laminariæ*, Clifden Bay.

The fifth feet and gnathopods of our specimens differ slightly from the figures given by Dr. Claus; and the body and antennæ of the animal, especially in the male, are beautifully banded with dark vinous red.

4. *Thalestris hibernica*, n. sp. Pl. VIII. figs. 17-19.

Body slender, rostrum of considerable length. Anterior antennæ nine-jointed, of moderate length, rather thickly clothed along the anterior margin with shortish hairs; second, third, and fourth joints nearly equal in length, about twice as long as broad; fifth, sixth, seventh, and ninth also nearly equal, and about half the length of the foregoing; penultimate joint much smaller: anterior antennæ of the male shorter and swollen, third joint very short and constricted, fourth much the longest and as wide as the two basal joints, armed with a long falciform appendage, fifth and sixth joints about half the length and breadth of the fourth, seventh and eighth very small, last joint as long as the fifth, but very narrow; a few crowded setæ on the margin of the second joint, and three small ones at the apex of the last joint: posterior antennæ and mouth-organs as usual in the genus. Posterior maxillipeds terminating in a slender clawed hand, in shape approaching that of *T. longimana*, the propodos being irregularly angular and subcrescentic, with the internal angle slightly setose; the unguis strong and well curved. First pair of swimming-feet almost as in *T. longimana*, except that the terminal claws and setæ are longer and more slender, the two branches being nearly equal, and the long claw equal in length to the branch itself. The inner branch of the second pair of feet in the

male is only two-jointed. Longest tail-seta about as long as the body of the animal. Length $\frac{1}{30}$ of an inch.

T. hibernica was taken in no very great numbers in the surface-net in Westport Bay. Anatomically it bears a very close resemblance to, and we have some doubt whether it ought not to be considered as a variety of, the following species. It is, however, very much more slender in all its parts, has not the same tough leathery skin, the same vivid colouring, nor the gibbous outline. That it is not a young form of *T. longimana* is proved by many of the female specimens bearing fully formed ovisacs.

5. *Thalestris longimana*, Claus.

Valentia Harbour and Killybegs (*Mr. E. C. Davison*).

Genus PARATHALESTRIS, nov. gen.

Generi antecedenti similis; pedum vero secundi paris rami interni biarticulati; mandibulæ parvæ, tenues, palpo tenui elongato, ramo secundario minuto, ramo majore setis longis numerosis fimbriato.

Parathalestris Clausii (Norman).

Thalestris Clausii, Norman, Last Shetland Dredging Report, p. 297.

On weeds in Birtirbuy, Clifden, and Westport Bays.

We here follow M. Boeck in restricting the generic name *Thalestris* to those species of Claus's genus which have both branches of all the swimming-feet three-jointed, and the mouth-apparatus constructed as in *T. mysis* and *harpactoides*. The second pair of feet and the mandibles in the present species do not fulfil these conditions.

Genus DACTYLOPUS, Claus.

1. *Dactylopus Stromii* (Baird).

On weeds in Ventry Bay, Valentia Harbour, and Killybegs.

2. *Dactylopus tisboides*, Claus.

In pools near Clifden, and taken in the surface-net in Westport Bay; moderately abundant.

3. *Dactylopus* (?) *cinctus*, Claus.

Taken in the surface-net in Westport Bay; only four or five specimens, all males.

4. *Dactylopus* (?) *minutus*, Claus.

In the same locality as the preceding species; scarce.

Genus NITOKRA, Boeck.

Nitokra tenuicornis (Claus).

Dactylopus tenuicornis, Claus, Die frei-lebend. Copepod.

On *Laminaria saccharina* in Clifden Bay; taken also in the surface-net in Westport Bay, and more abundantly in Roundstone Bay.

Genus MESOCHRA, Boeck.

Mesochra Lilljeborgii, Boeck.

One specimen, apparently referable to this species, and agreeing closely, so far as our observation extended, with drawings kindly sent to us by M. Boeck, was taken in the surface-net in Westport Bay. M. Boeck doubtfully identifies the present species with that figured by Lilljeborg as *Canthocamptus Stromii*. This reference may possibly be correct, seeing that that author shows the inner branch of the second pair of feet as consisting only of two joints; but the descriptions of Baird and Claus refer to a species in which both branches of the second, third, and fourth pairs of feet are said to be three-jointed—not, therefore, to any species of the genus *Mesochra*.

Genus ASELLOPSIS, nov. gen.

Corpus depressum, segmentis caudalibus laminatis, rotundatis.
Pedum primi paris rami ambo biarticulati, interni elongati, valde uncinati, externi perbreves; quinti paris rami ambo subæquales: ceterum *Laophonti* omnino similis.

Asellopsis hispidus, n. sp. Pl. IX. figs. 6–10.

Body elongated, much depressed, lower thoracic segments distinctly narrowed, the margins of the first three abdominal segments produced downwards at the sides in an imbricated manner. Anterior antennæ short, densely setose, seven-jointed, first two joints not much longer than broad, third about the same length but much narrower, fourth very short and broad, fifth about twice as long as the fourth, sixth and seventh equal and very small, the proportionate lengths of the joints, beginning at the base, being as follows—9, 9, 9, 3, 5, 2, 2: posterior antennæ nearly as large as the anterior, biarticulate, bearing a very small one-jointed secondary branch. Mouth-apparatus as in *Laophonte*; second pair of maxillipeds three-jointed, with an oval hand and long slender claw. First pair of feet having the inner branch very long, biarticulate, the first joint much elongated, terminal claw thick and strong; outer branch also biarticulate, the entire length being less than half that of the

first joint of the inner branch ; second, third, and fourth pairs of feet with the outer branch long and three-jointed, the inner very short and two-jointed ; fifth pair rather narrow and elongated, the two laminae being of nearly equal length. Caudal segments very broad, rounded ; surface hispid towards the margins ; terminal setae very short, the longest not much exceeding the length of the segment itself. Length $\frac{1}{35}$ of an inch.

Several specimens of *A. hispidus* were taken in the surface-net in Westport Bay. We have also dredged it sparingly in a depth of from four to ten fathoms off the Durham coast, and more abundantly on a bed of fine clean gravel off Glen Sannox, Arran (N. B.).

Genus LAOPHONTE, Philippi.

1. *Laophonte similis* (Claus).

In tidal pools on Great Isle of Aran ; and on *Laminariæ* and other weeds in Westport, Clifden, Roundstone, and Ventry Bays : not uncommon.

2. *Laophonte forcipata* (?) (Claus).

Amongst weeds in Westport Bay.

Genus CLETODES, Brady.

Cletodes limicola, Brady.

Dredged in Westport Bay.

Genus ORTHOPSYLLUS*, nov. gen.

Lilljeborgia, Claus.

Cletodes, Boeck (not of Brady).

Orthopsyllus linearis (Claus).

One specimen, taken on a sponge dredged in Westport Bay.

The name *Lilljeborgia* having previously been applied to an Amphipod Crustacean, it became necessary to rename the genus so called by Dr. Claus. M. Boeck † considers it to be identical with *Cletodes*, Brady, and applies to it that name ; but the differences between the two are not unimportant. *Lilljeborgia* is stated by Claus to have the first antennæ four-jointed, the second antennæ with a secondary branch, the first pair of swimming-feet to have a two-jointed well-developed inner branch, while the three following pairs of feet have the inner

* ὀρθός, straight ; ψύλλος, a flea.

† Nye Slægter og Arter af Saltvands-Copepoder, 1872.

branch quite rudimentary. *Cletodes*, however, has the first pair of antennæ six-jointed, the second antennæ without a supplementary branch, and the four pairs of swimming-feet all alike, the inner branch ending in two long filaments. Under these circumstances we propose to call Claus's genus *Lilljeborgia* by the new name *Orthopsyllus*.

GENUS PORCELLIDIUM, Claus.

1. *Porcellidium fimbriatum*, Claus.

? *Sterope ovalis*, Goodsir, Ann. & Mag. Nat. Hist. vol. xvi. (1845), pl. xi. fig. 11.

Dredged on a bottom of decaying vegetable mud in Birtirbuy Bay, and on *Laminariæ* in Clifden and Ventry Bays.

It seems to us most probable that Goodsir's figures and description (*loc. cit.*) apply to this species, and not to *Zaus ovalis* as supposed by Dr. Claus. If this could be ascertained with certainty, Goodsir's nomenclature would have to be adopted on the ground of priority.

2. *Porcellidium viride* (Philippi).

Thyone viridis, Phil. Archiv für Naturg. 1840, p. 190, Taf. iv. fig. 2.

Porcellidium dentatum, Claus, Die frei-lebend. Copepod. (1863) p. 140, Taf. xxii. figs. 2-5; and Beiträge zur Kenntniss der Entom. (1860), Taf. ii. figs. 19-22.

Dredged in Birtirbuy Bay in company with the preceding species; on weeds in Clifden, Westport, and Ventry Bays.

There can be little doubt that Dr. Philippi's figure applies to this species; and we therefore adopt his specific name; but the generic term *Thyone* is preoccupied, having been applied by Oken to a genus of Holothuriadæ.

3. *Porcellidium subrotundum*, Norman.

P. subrotundum, Norman, Last Shetland Dredging Report, p. 297.

Dredged in Birtirbuy Bay with the foregoing; also on the fronds of *Laminariæ* in Clifden Bay.

4. *Porcellidium tenuicauda*, Claus.

P. tenuicauda, Claus, Beiträge zur Kenntniss der Entom. (1860), p. 6, pl. ii. figs. 10-15; and Die frei-lebend. Copepod. p. 140.

A few specimens taken from the interior of the "bulb" of *Laminaria bulbosa* in Birtirbuy Bay; also on weeds in Clifden and Ventry Bays. Scarce.

Fam. **Corycæidæ.**Genus **CORYCÆUS**, Dana.*Corycæus anglicus*, Lubbock.*C. anglicus*, Lubbock, Ann. & Mag. Nat. Hist. ser. 2, vol. xx. (1857), pl. x. figs. 14-17.*C. germanus*, Leuckart, Archiv für Naturg. (1859), Taf. vi. fig. 9; Thorell, Bidrag till Kännedomen om Krustaceer (1859), tab. xi., xii. fig. 17; Claus, Die frei-lebend. Copepod. (1863), p. 156, Taf. ix. figs. 1-4, Taf. xxiv. figs. 5, 6, Taf. xxviii. figs. 1-4.

Taken in the surface-net in several localities, but nowhere plentifully. Between Cornwall and Cape Clear; Kinsale Harbour, Dingle Bay; in Valentia Harbour, and near the Skelligs. For all these gatherings we are indebted to Mr. E. C. Davison of Sunderland.

Fam. **Sapphirinidæ**, Thorell.Genus **LICHOMOLGUS**, Thorell.1. *Lichomolgus furcillatus*?, Thorell.*L. furcillatus*, Thorell, Bidrag till Kännedomen om Krustaceer, som lefva i Arter af Slägtet Ascidia (1859), p. 74, tab. xiii. fig. 20.

One specimen, which is probably referable to this species, was taken in the surface-net in Roundstone Bay.

2. *Lichomolgus fucicolus* (Brady).*Macrocheiron fuciculum*, Brady, Ann. & Mag. Nat. Hist. vol. x. (1872), p. 9, pl. iii. figs. 9-18; and Nat. Hist. Trans. North. and Durham, p. 434, pl. xviii. figs. 9-18.

This was described by one of us last year under a new generic name, the fact of its being taken amongst algæ having caused us to omit reference to M. Thorell's work, which deals only with species parasitic in Ascidians. The genus *Cyclopicera* proposed in the same paper seems also to be very closely allied to, though scarcely identical with, the previously established *Ascomyzon* of Thorell.

One specimen of *L. fucicolus* was found amongst weeds in Westport Bay, and one in a similar situation in Clifden Bay; two or three specimens have also been found on the Durham coast.

Fam. **Ascomyzontidæ**, Thorell.Genus **ASCOMYZON**, Thorell.*Ascomyzon Lilljeborgii*, Thorell.*A. Lilljeborgii*, Thorell, loc. cit. p. 78, tab. xiv. fig. 21.

Taken in the surface-net: three specimens in Roundstone Bay, and three in Westport Bay.

This species is described by Thorell as being a common parasitic inhabitant of *Ascidia parallelogramma*.

Genus SOLENOSTOMA, nov. gen.

Generi antecedenti simile. Antennæ vero primi paris breves, 12-articulatæ; secundi paris magnæ, biramosæ, ramo principali 4-articulato, in apice spinis 2 fortibus aculeatis armato. Maxillarum rami secundarii obsoleti, setis 2 ciliatis compositi.

Solenostoma scutatatum, n. sp.

Body subpyriform; cephalothorax broadly ovate, first segment equal to half the entire length of the animal. Anterior antennæ very short, equal to scarcely one third the length of the first segment of the body, densely setose: posterior about equal in length to the anterior, stout; primary branch terminating in two strong lancet-shaped spines, one of which is much longer than the other, and bearing also one moderately long and two small setæ; secondary branch simple, uniarticulate, and bearing a long terminal seta. Mandible tubular, excessively long, reaching as far as the middle of the caudal segments; palp long, filiform, and setose. Caudal segments three or four times as long as broad, each bearing one short lateral and five long apical setæ, two of which are strongly plumose. Length $\frac{1}{30}$ of an inch.

Found sparingly on the fronds of *Laminaria* in Clifden Bay.

A very remarkable animal, differing from the genus *Ascomyzon* chiefly in the structure of the maxillæ and second pair of antennæ, but agreeing with that genus in the general conformation of the mouth-apparatus.

Genus ASTEROCHERES, Boeck.

Asterocheres Lilljeborgii, Boeck.

A. Lilljeborgii, Boeck, Tvende nye parasitiske Krebsdyr (1859), p. 6, tab. 2.

Three specimens were found on a sponge dredged in Westport Bay. M. Boeck's specimens were taken on the disk and rays of *Echinaster sanguinolentus*; but though after its first discovery that author sought for the little parasite diligently on many examples of the starfish, he did not succeed in finding any further specimens. It would appear, indeed, from the various positions in which we have found many of these suctorial or parasitic species, that they are not very fastidious as to the source from which they draw their nourishment.

EXPLANATION OF THE PLATES.

PLATE VIII.

- Fig. 1.* *Paracalanus hibernicus*, anterior antenna. *Fig. 2.* Fifth pair of feet of male. *Fig. 3.* Fifth pair of feet of female.
Fig. 4. *Pseudocyclops obtusatus*, right anterior antenna of male. *Fig. 5.* Right anterior antenna of female. *Fig. 6.* Posterior antenna.
Fig. 7. Foot of fifth pair (female).
Fig. 8. *Paratachidius gracilis*, anterior antenna of female. *Fig. 9.* Anterior antenna of male. *Fig. 10.* Mandible and palp. *Fig. 11.* Maxilla.
Fig. 12. Anterior maxilliped. *Fig. 13.* Posterior maxilliped.
Fig. 14. Foot of first pair. *Fig. 15.* Foot of fifth pair (female).
Fig. 16. Foot of fifth pair (male).
Fig. 17. *Thalestris hibernica*, anterior antenna of female. *Fig. 18.* Posterior maxilliped. *Fig. 19.* Foot of first pair.

PLATE IX.

- Fig. 1.* *Ilyopsyllus coriaceus*, female*, seen from below: *a*, anterior antenna; *b*, posterior antenna; *c*, foot of first pair. *Fig. 2.* Anterior antenna. *Fig. 3.* Posterior antenna. *Fig. 4.* Mandible and palp. *Fig. 5.* Foot of second pair.
Fig. 6. *Asellopsis hispidus*, female, seen from side. *Fig. 7.* Anterior antenna of female. *Fig. 8.* Posterior maxilliped. *Fig. 9.* Foot of fifth pair. *Fig. 10.* Posterior abdominal segments.
Fig. 11. *Microsetella atlantica*, female (?), seen from side. *Fig. 12.* Posterior antenna. *Fig. 13.* Mandible. *Fig. 14.* Anterior maxilliped. *Fig. 15.* Posterior maxilliped (?). *Fig. 16.* Foot of fifth pair.
Fig. 17. *Harpacticus flexus*, anterior antenna of female. *Fig. 18.* Anterior antenna of male. *Fig. 19.* Posterior maxilliped. *Fig. 20.* Foot of fifth pair (female). *Fig. 21.* Foot of fifth pair (male).

XIX.—New Fishes from Angola.

By Dr. ALBERT GÜNTHER.

MR. MONTEIRO has brought home a small collection of fishes from Angola. Some of them were collected in a lake some 100 miles inland of Ambriz. Besides *Pellonula vorax* and *Ophiocephalus obscurus* (with thirty rays in the anal fin) and some other known forms, the following undescribed species were in this collection.

Gymnallabes apus.

D. ca 140. A. ca 126. Body exceedingly elongate, its depth being one twenty-third of the total length (without caudal), the length of the head one thirteenth. Pectoral fins reduced to a minute rudiment, ventrals entirely absent; vertical fins only half as high as the body. The maxillary and outer mandibular barbels are nearly equal in length, extending somewhat beyond the gill-opening, and rather longer



Brady, George Stewardson and Robertson, David. 1873. "Contributions to the study of the Entomostraca. No.VIII. On marine copepoda taken in the West of Ireland." *The Annals and magazine of natural history; zoology, botany, and geology* 12, 126–142.

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