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## CRUSTACEA

BY

EDUARD VON MARTENS, M.D., C.M.Z.S.

DOHRN, A. Untersuchungen über Bau u. Entwicklung der Arthropoden. XI. Zweiter Beitrag zur Kenntniss der Malakostraken und ihrer Larvenformen. Z. wiss. Zool. xxi. pp. 356-379, pls. 27-30.

HELLER, C. Untersuchungen über die Crustaceen Tirols. Verh. Ver. Innsbr. i. pp. 67-96, pls. 1 & 2.

HESSE, M. Observations sur des Crustacées rares ou nouveaux des côtes de la France.—No. XIX. Ann. Sci. Nat. (5) xv. 50 pp. 2 pls.

POURTALÈS, L. F. DE. [See STIMPSON.]

SIEBOLD, C. T. VON. Beiträge zur Parthenogenesis der Arthropoden. Leipzig, 1871, 8vo, 238 pp., with 2 pls.

STIMPSON, W., & POURTALÈS, L. F. DE. Preliminary Report on the Crustacea dredged in the Gulf-stream in the Straits of Florida.—Part I. Brachyura. Bull. Mus. C. Z. ii. no. 2, Dec. 1870, pp. 109-160.

## PHYSIOLOGY.

The regular occurrence of parthenogenesis in *Apus*, *Artemia*, *Limnadia*, and perhaps also *Polyphemus*, is substantiated by Von SIEBOLD (Beiträge &c. pp. 160-222). The ♂ of *Apus*, long unknown, has been detected by Kozubowski at Cracow, and subsequently found also in a few other localities, but always from 46 to 50 per cent. less in number than the ♀, according to the statements of different authors. Siebold himself has examined a large number of *Apus cancriformis*, from a pond near Munich, for 6 consecutive years, in some years during 2 or 3 different months, and on three occasions probably scrutinizing all the colony (once, no less than 5796 in number) existing in the pond, which was dried up: but *all* the specimens he examined were ♀. He is therefore persuaded that in *Apus*, as in some *Insecta*, the ♀ can produce fertile eggs without male connexion, at all

events for 6 consecutive generations. The exceeding rarity of the ♂ in *Artemia*, the want of our knowledge of that sex in *Limnadia*, and the occurrence only in autumn of males of *Polyphemus* and *Bythotrephes*, lead the author to the conclusion that in these genera a similar parthenogenesis is a regular (not exceptional) occurrence, varying in the two last-named genera at fixed periods with bisexual propagation, whereas in *Branchipus*, *Estheria*, and *Limnetis* the males are to be found in sufficient number. Finally, the author supports Lubbock's opinion (Phil. Tr. 1857), that no distinct line of division can be drawn between eggs and buds.

The spermatoids of *Gammarus pulex* described by BÜTSCHLI, Z. wiss. Zool. xxi. pp. 415 & 533, pl. 40. fig. 7.

#### TERATOLOGY.

HERKLOTS describes some deformities in the claws of several *Crustacea*, especially *Xantho punctulata* (Haan) and *Eriphia spinifrons* (Herbst), in which the movable finger is double or triple. Arch. Néerl. v. pp. 1-10, pl. 1: cf. also Tijdschr. Ent. (2) v. pp. 69-78, pl. i. for a similar paper by this author on these species and *Lithodes arctica* (Lam.).

#### CONTRIBUTIONS TO FAUNAS.

Böck's exhaustive paper on boreal and arctic *Amphipoda* (Overs. Dan. Selsk. 1870, pp. 83-278), mentioned in Zool. Rec. vii. p. 188, contains very valuable information on the geographical distribution of the northern species, chiefly in Spitzbergen, Greenland, and through the whole length of Norway.

Observations on the abundance of several arctic species are given by Buchholz, Erlebnisse der Mannschaft des Schiffes Hansa (Königsberg: 1871), pp. 3, 4, 13, &c.

The Norwegian *Mysidæ* are the subject of a monograph commenced by Sars (see p. 185).

A review of the *Cypridinidæ* of the European seas is given by Brady, P. Z. S. 1871, pp. 289-295.

The parasitic Copepods of Scandinavia are enumerated by Olsson, Act. Lund. v.

62 species of *Crustacea*, observed at St. Malo and Roscoff, in Northern France, are enumerated by Grube, Mittheil. üb. St. Malo u. Roscoff, pp. 64-66.

15 species of *Crustacea*, including 6 Cirripeds, observed by Lafont near Arcachon, are enumerated, Act. Soc. L. Bord. xxviii. pp. 260-262.

Some rare *Crustacea* found in Wirtemberg are indicated by Leydig, JH. Ver. Würt. xxvii. pp. 268-270; among them are *Daphnella brachyura* (Lievin), *Leptodora hyalina* (Liljeborg), and *Latona setifera*, in the lake of Constance, *Asellus cavaticus*, sp. n., in the cave of Falkenstein, and *Argulus phoxini*, sp. n., near Tübingen.

Klunzinger's life-like description of a coral-reef in the Red Sea treats, among other things, of the occurrence and habits of several *Crustacea*. Verh. z.-b. Wien, xx. pp. 389-394.

A few observations concerning Chinese freshwater crabs, kept alive for 40 or 50' days and used extensively as food, are to be found in Cooper's 'Pioneer of Commerce,' p. 424, extracted in Ann. N. H. (4) viii. p. 72.

For HAGEN's monograph of the North-American *Astacida* see p. 185.

VERRILL has observed, in the depths of Lake Superior, *Mysis relicta* and *Pontoporia affinis*, both identical with individuals found in Lake Wettern, in Sweden, by Lovén, and describes some other Isopods found in the same lake: Am. J. Sc. (3) ii. pp. 374 & 452. STIMPSON has found also a species of *Mysis*, probably *M. relicta*, in Lake Michigan: Am. Nat. iv. p. 404.

Some *Crustacea* found in caves of N. America are mentioned by Cope, Ann. N. H. (4) viii. p. 368.

The N.-American *Phyllopoda* are the subject of a paper by Packard, *ibid.* p. 332, and the *Ostracoda* by G. S. Brady, Canad. Nat. v. no. 4.

## DECAPODA.

### BRACHYURA

#### OXYRHYNCHA.

#### LEPTOPODIIDÆ.

*Podochela gracilipes*, sp. n., Stimpson, Bull. Mus. C. Z. ii. p. 126, reefs of Florida Straits.

*Podonema* [as *Podinema*, preoccupied in *Reptilia*], g. n., differs from *Podochela* in its hood-shaped rostrum and the existence of lamelliform ridges in the region of the pterygostoma, defining the afferent channels. *P. (Podochela) rüsti* (Stimps.) and *P. lamelligera* and *hypoglypha*, spp. nn., Straits of Florida: *id. l. c.* pp. 126 & 127.

#### EURYPODIIDÆ.

STIMPSON, *l. c.*, characterizes the following new genera and spp. &c. :—

*Collodes trispinosus* and *nudus*, Florida, pp. 120 & 121.

*Arachnopsis*, differing from *Collodes* in its filiform ambulatory feet and long eye-peduncles. *A. filipes*, reefs near Florida, 34–45 fathoms, p. 121.

*Batrachonotus*, characterized by the want of a terminal spine on the basal joint of the antennæ, and in its very long anterior and short posterior ambulatory feet. *B. fragosus*, Straits of Florida, p. 122.

*Euprognatha*, characterized by an interantennular spine, which renders the rostrum trifid, an erect spine on the orbital arch, and the meros joint of the outer maxillipeds being somewhat L-shaped. *E. rostellifera*, Florida Straits, pp. 122 & 123.

*Anathia modesta*, Sand Key, 120 fathoms, p. 124.

*Anomalopus* [as *Anomalipus*, preocc. in *Coleoptera*]. Carapace elongated, subcylindrical; posterior pair of feet larger than penultimate; orbital arch but slightly distinct; postocular spine small. Type of new subfamily, *Anomalopinæ* [better *Anomalopodinæ*]. *A. furcillatus*, Straits of Florida, 123 fathoms, pp. 124 & 125.

## MAIIDÆ.

STIMPSON, *l. c.*, characterizes the following new genera and spp. &c. :—  
*Mithrax pleuracanthus*, *acuticornis*, and *holderi*, pp. 116 & 117, Florida and Tortugas.

*Mithraculus ruber*, Florida and Cuba, p. 118.

*Tyche emarginata* (White) = *Platyrrhynchus trituberculatus* (Desbonne & Schramm), redescribed, p. 119.

*Pyromaia* [? *Piromaia*, vox hybrida, rectius *Apiomaia*]. Near *Microrhynchus* (Bell); carapace more elongated and pear-shaped; rostrum larger, prominent, simple; meros joint of the outer maxillipeds with an angular prominent external lobe. *P. cuspidata*, S.W. of Sand Key, Florida, pp. 109 & 110.

*Pericera camptocera*, *eutheca*, and *septemspinosa*, Florida, pp. 112 & 113. The author states that the eyes are perfectly retractile in this genus.

*Tiarinia setirostris*, Key West, p. 114.

*Scyra umbonata*, Sand Key, Florida, p. 115.

*Pisa antilocapra* and *prælonga*, Florida reefs, pp. 110 & 111.

## ACANTHONYCHIDÆ.

*Mocosoa*, g. n., near *Epialtus*, but with immovable eyes, as in *Huenia*. *M. crebripunctata*, sp. n., French Reef, Straits of Florida: *id. l. c.* p. 128.

## PARTHENOPIDÆ.

*Lambrus crenulatus* (Sauss.) and *pourtalesi*, *fraterculus*, *agonus*, spp. nn., all from the Straits of Florida: *id. l. c.* pp. 129–132.

*Solenolambrus*, g. n. Carapace naked, polished; the afferent channels distinct; meros joint of outer maxillipeds without notch. *S. typicus* and *tenellus*, spp. nn., Straits of Florida, in about 90 and 40 fathoms: *id. l. c.* pp. 132–135.

*Mesorhæa*, g. n. Carapace as in the former; afferent channels meeting at the middle of the endostome; meros joint of outer maxillipeds acutely produced forward at its internal angle, covering the palpus. *M. sexspinosa*, [rectius *sex-spinosa*], sp. n., Loggerhead Key, Straits of Florida, 11 fathoms; *id. l. c.* pp. 135–137.

*Cryptopodia concava*, sp. n., Straits of Florida: *id. l. c.* p. 137.

## CYCLOMETOPA.

## CANCRIDÆ.

*Carpoporus*, g. n. Chelipeds, when retracted, leaving a large hole between carpus and hand for the passage of water to the afferent branchial apertures. *C. papulosus*, sp. n., *id. l. c.* pp. 138 & 139, Straits of Florida.

*Micropanope*, g. n. 5 teeth on the antero-lateral margin, as in *Panopeus*, but the 2nd tooth coalescent with the scarcely prominent angle of the orbit, and the posterior tooth minute; external hiatus of the orbit reduced to a simple emargination. Of small size, never littoral. *M. sculptipes*, sp. n., Straits of Florida, 15–68 fathoms: *id. l. c.* pp. 139 & 140.

*Chlorodius dispar*, sp. n., *id. l. c.* p. 140, Cuba.

## ERIPHIIDÆ.

*Plumnus floridanus, lacteus, agassizi, nudifrons*, and *granulimanus*, spp. nn., *id. l. c.* pp. 141-143, Straits of Florida.

*Melybia*, g. n. Allied to *Melia*; antero-lateral margin 3-toothed; basal joint of outer antennæ firmly soldered; feet spinulose. *M. thalassia*, sp. n., Florida Straits, 15-37 fathoms: *id. l. c.* pp. 144 & 145.

## PORTUNIDÆ.

*Liocarcinus*, g. n., proposed for *Portunus marmoreus* (Leach) on account of the aberrant form of its maxillipeds and its naked carapace, which almost entirely conceals the first abdominal joint: *id. l. c.* pp. 145 & 146, footnote.

*Bathynectes*, g. n. Antero-lateral teeth spiniform, separated by considerable intervals; no frontal median tooth; hiatus of orbit widely open; mesos joint of outer maxillipeds not projecting anteriorly. *B. longispina & brevispina*, spp. nn., Straits of Florida, 100-120 fathoms: *id. l. c.* pp. 145 & 147.

*Achelous spinicarpus* and *tumidulus*, spp. nn., *id. l. c.* pp. 148 & 149, Florida reefs.

*Portunus puber* (L.) proved to be a dangerous enemy to oyster-beds by Lafont & Fischer, Act. Soc. L. Bord. xxvii. p. 77.

## CATOMETOPA.

## CARCINOPLACIDÆ.

Two new subfamilies, *Euryplacinae* and *Eucratopsinae*, are proposed by Stimpson (*l. c.* p. 152), in both of which the vergal canals are closed, though in the first the anterior corners of the posterior segment of the sternum is exposed, instead of being covered by the abdomen, and the first joint of the abdomen is narrow and very little developed. In the latter, this joint is well developed, and much broader than the second, which is much narrower than the third. To it belong *Eucratopsis* (Smith) = *Eucrate* (Dana), and *Panoplax*, g. n., resembling *Panopeus*, with deflexed front, broad and depressed carapace, elongated hands, &c., containing a sp. n., *P. depressa*, East and Middle Keys, Tortugas, Florida.

## PINNOTERIDÆ.

*Pinnoteres ascidiicola*, on *Ascidia canina*, and *P. pectunculi*, in the shell of *Pectunculus*: Hesse, Ann. Sci. Nat. (5) xv. p. 30-38, spp. nn., Northern France.

## OXYSTOMA.

## CALAPPIDÆ.

*Acanthocarpus*, g. n. Carapace without lateral expansion; fronto-orbital region very broad, occupying more than half the width of the carapace; a strong tooth about the middle of the postero-lateral margin; chelipeds with

a large horizontal spine on the carpus; all ambulatory feet with slender dactyli. *A. alexandri*, sp. n., Quicksands, Florida, 74 fathoms: *id. l. c.* pp. 152 & 153.

#### MATUTIDÆ.

*Osachila*, g. n. Allied to *Hepatus* in all essential characters, but differing notably in the shape of the carapace, which is nearly as long as broad, with the front much produced, and has a very uneven surface, exhibiting 6 chief protuberances. *O. tuberosa*, sp. n., Florida reefs, 36-68 fathoms: *id. l. c.* pp. 154 & 155.

#### LEUCOSIDÆ.

*Iliacantha*, g. n. Closely allied to *Iliä*, but having 3 spines (one median) at the posterior extremity of the carapace, and the hands twisted, so that the fingers open in a vertical plane. *I. subglobosa* and *sparsa*, spp. nn., Florida reefs, 30-60 fathoms: *id. l. c.* pp. 155 & 156.

*Myropsis*, g. n. Nearly allied to *Myra*, but more globular, with 3 posterior spines and no median or hepatic ridges; outer margin of the maxillipeds straight; basal joint of the antennulæ crested. *M. quinquispinosa*, sp. n., Florida reefs, 21 and 82 fathoms: *id. l. c.* pp. 156 & 157.

*Callidactylus*, g. n. Outer margin of the exognath of the outer maxillipeds convex; basal joint of the antennulæ with no indurated crest; ambulatory feet naked, penultimate joint compressed, with a lamiform crest above and below; dactyli of the 3 anterior pairs 3-edged, of the posterior 2-edged. *C. asper*, sp. n., Florida reefs, 16-37 fathoms: *id. l. c.* pp. 157-159.

*Lithadia cadaverosa*, sp. n., *id. l. c.* p. 159, Florida reefs, 35-40 fathoms.

#### ANOMURA.

LYTTKENS (Act. Lund. v. pp. 43-111, 2 pls.) has given a very copious and detailed description of the skeleton and the muscles of *Lithodes maia*, often quoting those of the lobster for comparison. It is, however, to be regretted that he has not finally summed up the principal resemblances and dissimilarities which this genus has on the one side with the *Brachyura* and on the other with the *Macrura*.

The long-known connexion of some spp. of *Pagurus* with others of *Actinia*, *Hydractinia*, and Sponges (*Suberites domuncula*), attached to dead shells, is discussed at great length, and some new facts of similar fossil occurrences in tertiary and cretaceous strata are added, by Des Moulins, Act. Soc. L. Bord. xxviii. pp. 325-356.

*Porcellana*? Zoea-like larva described by A. Dohrn, Z. wiss. Zool. xxi. p. 372, pl. 29. figs. 48-51.

#### MACRURA.

CHANTRAN has continued his observations concerning the development of the Crayfish and its moults. C. R. lxxiii. p. 220; abstracted in Ann. N. H. (4) vii. pp. 219 & 220 (*cf.* Zool. Rec. vii. p. 194).

HAGEN has published a very elaborate monograph of the American *Astacidae* (written in 1868, and issued as an illustrated catalogue of the Mus. Comp. Zool. at Harvard College, no. iii. 1870, pp. 1-109, pls. 1-11, imp. 8vo). He points out accidental variations and differences of age and sex, and states that in most species of *Cambarus* there are two forms of the males, one retaining in advanced age the articulation and shape of the first abdominal legs proper to the young specimens, while the other loses this articulation. He urges the generic difference between the American *Cambarus* and the Old-World *Astacus*, and states that all freshwater crayfish of N. America east of the Rocky Mountains belong to the former, and all living in California, Oregon, and British Columbia to the latter of those genera.

The following species of American *Astacidae* are observed and described by him:—

*Cambarus*. Group 1: *acutus* (Girard), *clarkii* (Gir.), pl. 4, *troglydytes* (Lec.), *blandingi* (Harlan), *fallax*, sp. n., Florida, *lecontii*, sp. n., Georgia, Alabama, Florida, *spiculifer* and *angustatus* (Lec.), *versutus*, sp. n., Alabama, *penicillatus* (Lec.), *pellucidus* (Telk.), pl. 6.

Group 2: *C. lancifer*, sp. n., Mississippi, *affinis* (Say), pl. 5, *virilis*, sp. n., pl. 8, from Canada to Texas, *placidus*, sp. n., Tennessee, Illinois, Texas, *juvenilis*, sp. n., Kentucky and Osage R., *propinquus* (Girard), *obscurus*, sp. n., New York, *rusticus* (Girard), *immis*, sp. n., hand, pl. 8. fig. b, Illinois and Alabama, *extraneus*, sp. n., Tennessee R.

Group 3: *C. bartoni* (Fabr.), *robustus* (Gir.), *obesus*, sp. n., pl. 9, from Lake Michigan to New Orleans, *latimanus* (Lec.), *advena* (Lec.), pl. 7, and *carolinus* (Erichs.).

*Astacus gambeli* (Gir.), pl. 11, *nigrescens*, *trowbridgii*, pl. 10, and *klamathensis* (Stimps.).

The first abdominal legs of the males, the antennal lamina, epistoma, and external spine of the antennæ of many of these species are figured, pls. 1-3.

*Astacus subgrundialis*, *chenoderma*, and *breviforceps*, spp. nm., Cope, P. Am. Phil. Soc. xi. pp. 605-607, fossil, from the freshwater territory of Idaho, may be mentioned here as most nearly allied to recent American spp.

*Paneus*? Zœa-like larva described by A. Dohrn, Z. wiss. Zool. xxi. p. 375, pls. 29 & 30. figs. 54-61.

## STOMAPODA.

SARS ('Carcinologiske bidrag til Norges Fauna,' i. Hefte, Christiania, 1870, 4to, pp. 64, pls. 5) has commenced a monograph of the Norwegian *Mysidae*, containing a concise account of the many peculiarities of that family, and accurate descriptions of 3 genera and 8 species.

He distinguishes the genera of the *Mysidae* as follows:—

1. *All* pleopods of ♂ different from those of ♀, natatory, 2 branched.

Molar process of mandibles distinct.

Incisive lobes of 1st pair of maxillæ 3.

Marsupium of ♀ formed by the basis of only the posterior 4-6 feet.



Eyes well developed, red ; feet filiform, telson entire, short.

*Erythroops.*

Eyes well developed, black ; feet short, with long bristles, telson with stout spines . . . . . *Leptomysis.*

Eyes rudimentary, separate ; feet stout, with terminal claw.

*Amblyops.*

Eyes rudimentary, coalite ; feet filiform, without terminal claw.

*Pseudomma.*

Marsupium formed by the basis of all the feet, and also of 2nd pair of maxillipeds ; otoliths rudimentary . . . . . *Boreomysis.*

Incisive lobes of 1st pair of maxillæ 2 ; feet stout, hairy, joints 3 & 4 dilated, terminal joint setiform . . . . . *Mysideis.*

Molar lobes of mandibles rudimentary.

Appendage of upper antennæ in ♂ large ; tarsi 3-jointed.

*Mysidopsis.*

Appendage of upper antennæ in ♂ rudimentary ; feet very stout, tarsi 2-jointed ; pleopods of ♂ with a peculiar coiled appendage.

*Siriella.*

2. Only *some* pleopods of ♂ different from those of ♀.

Only 1st pair of pleopods equal in both sexes ; the next in ♂ natatory, 2-branched . . . . . *Parerythroops.*

The first 2 pairs of pleopods equal in both sexes ; the next two not natatory in ♂, penultimate pair very long.

The last pair of pleopods natatory, 2-branched ; dorsal shield overlapping almost all segments of anterior part of body *Hemimysis.*

The last pair of pleopods rudimentary as in ♀ ; dorsal shield small.

*Mysis.*

3. All pleopods equal in both sexes . . . . . *Mysidella.*

*Erythroops*, new name for the preoccupied *Nematopus* (Sars), comprising *goesi* = *Mysis erythrophthalmia* (Goës), *id. l. c.* p. 24, pl. 1 ; *serrata*, p. 27, pl. 2. figs. 1-12 ; *microphthalmia* = *Nematopus microps* (Sars, 1863), p. 30, pl. 2. figs. 13-19 ; *pygmæa* = *N. elegans* (*id.*, 1862), p. 33, pl. 2. figs. 20-28 ; and *abyssorum*, p. 36, pl. 5. figs. 1-12 : all formerly named by Sars, but now fully described and figured : coasts of Norway, the last in the Christiania-fjord, at 150-230 fathoms.

*Parerythroops*, g. n. *P. obesa* (*Nematopus*, Sars, 1865), Dröbak, near Christiania, 50-60 fathoms : *id. l. c.* pp. 40-47, pl. 3.

*Pseudomma*. Eyes without pigment, crystalline lens, or other optic elements, forming a semilunar lamina at the base of the antennæ. *P. roseum* and *affine* (Sars, 1869), Lofoden Islands and Hardanger-fjord, at about 200 fathoms, in company with spp. of *Erythroops* : *id. l. c.* pp. 48-60, pl. 4, and pl. 5. figs. 13-22.

*Mysis mæbii*, sp. n., locality unknown, the appendages of the pleopods in the male minutely described by A. Dohrn, *Z. wiss. Zool.* xxi. pp. 359-363, pls. 27 & 28. figs. 11-22.

*Euphausia* : development described by Metschnikoff, *ibid.* pp. 397-401, pl. 34 ; it is hatched from the egg as a Nauplioid larva, and the 3 pairs of feet behind the larval natatory feet make their appearance at the same moulting, contrary to the rule prevailing in the Branchiopods, Copepods, and Cirripeds.

*Leucifer*. Some particulars concerning the circulatory and generative organs observed in specimens from the Philippines, probably of *L. reynaudi* (M.-E.), are described and figured by SEMPER ("Zoologische Aphorismen," i.), Z. wiss. Zool. xxii. pp. 305-307, pl. 22.

*Leucifer reynaudi* (M.-Edw.): male and female generative organs and other sexual differences described by A. Dohrn, l. c. pp. 356-359, pl. 27. figs. 1-10.

*Cerataspis monstruosus* [rectius *-a*] (Gray) = *Cryptopus defranci* (Latr.), from the Indian seas, accurately described, *id. ibid.* pp. 366-372, pls. 28 & 29. figs. 35-47.

## AMPHIPODA.

Böck (Overs. Dan. Selsk. 1870, pp. 83-278) gives the following systematic arrangement of the Norwegian and Greenland species:—

I. Div. HYPERIDÆ [rectius *-IDÆ*, *Hyperidæ* being also preoccupied in *Coleoptera*] (Dana).

1st fam. Hyperid[i]dæ: *Hyperia*, *Metœcus*, *Parathemisto*, *Themisto*.

2nd fam. Tryphanidæ (new): *Tryphana*.

II. Div. GAMMARIDÆ (Dana).

1st fam. Prostomatæ (Böck, 1860): *Trischizostoma*.

2nd fam. Orchestid[i]dæ: *Orchestia*, *Talitrus*, *Hyale*.

3rd fam. Gammaridæ (Dana).

Subfam. 1. Lysianassinæ (Dana): *Lysianassa*, *Ambasia*, *Ichnopus*, *Sarcarnes*, *Callisoma*, *Hippomedon*, *Cyphocaris*, *Eurytenes*, *Aristias*, *Anonyx*, *Onisimus*, *Menigrates*, *Orchomena*, *Tryphosa*, *Normania*, *Opis*, *Acidostoma*.

Subfam. 2. Pontoporiinæ (Dana): *Pontoporia*, *Priscilla*, *Argissa*.

Subfam. 3. Stegocephalinæ (Dana): *Stegocephalus*, *Andania*.

Subfam. 4. Amphilochninæ: *Amphilochnus*, *Gitana*, *Astyra*.

Subfam. 5. Phoxinæ: *Phoxus*, *Harpina*, *Sulcator*, *Urothoe*.

Subfam. 6. Stenothoinæ: *Stenothoe*, *Metopa*, *Cressa*.

Subfam. 7. Syrrhoinæ: *Syrrhoe*, *Tiron*, *Bruzelia*.

Subfam. 8. Pardaliscinæ: *Pardalisca*, *Halice*, *Nicippe*.

Subfam. 9. Leucothoinæ (Dana): *Liljeborgia*, *Eusirus*, *Leucothoe*, *Tritropis*.

Subfam. 10. Œdicerinæ (Lillj.): *Œdiceros*, *Acanthostepheia*, *Monocondodes*, *Halimædon*, *Pontocrates*, *Aceros*, *Haliceion*, *Œdiceropis*, *Paramphithoe*.

Subfam. 11. Iphimedi[i]næ: *Vertumnus*, *Iphimedia*, *Odius*, *Laphystius*.

Subfam. 12. Epimeri[i]næ: *Acanthozone*, *Epimeria*.

Subfam. 13. Dexamininæ: *Dexamine*, *Lampra*.

Subfam. 14. Atylinæ: *Atylus*, *Pontogeneia*, *Halirages*, *Calliopius*, *Amphithopsis*, *Cleidippides*, *Laothoes*.

Subfam. 15. Gammarinæ (Dana): *Gammarus*, *Pallasia*, *Mœra*, *Melita*, *Elasmopus*, *Chirocrates*, *Gammaracanthus*, *Niphargus*, *Amathilla*, *Melphidippa*.

Subfam. 16. Ampeliscinæ (Sp. Bate): *Ampelisca*, *Haploops*, *Byblis*.

Subfam. 16 b. Leptochirinæ: *Leptochirus*, *Goesia*.

Subfam. 17. Photinæ: *Photis*, *Microprotopus*, *Xenoclea*.

Subfam. 18. Microdeutopinæ: *Microdeutopus*, *Aora*, *Autonoe*, *Proto-media*, *Gammaropsis*, *Podoceroopsis*.

Subfam. 19. Amphithoinæ: *Amphithoe*, *Synamphithoe*.

Subfam. 20. Podocerinæ: *Podocerus*, *Janassa*, *Cerapus*.

Subfam. 21. Chelurinae (Allman): *Chelura*.

Subfam. 22. Corophi[i]næ (Dana): *Corophium*, *Siphonæcetus*, *Glaucanome*, *Hela*.

4th fam. Dulichi[i]dæ (Dana): *Dulichia*, *Paradulichia*, *Lætmatophilus*, *Xenodice*.

5th fam. Caprellidæ.

Subfam. 1. Caprellinæ: *Proto*, *Cercops*, *Ægina*, *Æginella*, *Caprella*, *Podalirius*.

Subfam. 2. Cyaminæ (Krøyer): *Platycyamus*, *Cyamus*.

*Gammarus arcticus* and *Themisto borealis* occur in large swarms in the Arctic sea, and form the principal food of many marine animals, probably also of the Right Whale. Buchholz, Erlebnisse &c. pp. 3-5.

#### GAMMARIDÆ.

Böck, l. c., characterizes the following new genera and spp. &c. :—

*Lysianassa plumosa*, Haugesund, in Norway, p. 96.

*Ambasia*. Hypostome very convex and prominent; maxillæ of first pair with very small inner lamina; maxillipeds with very large outer lamina; saltatory feet of the last pair short, with much shorter inner branch; caudal appendage short, cleft. *A. danielsseni*, Norway, pp. 97 & 98.

*Ichnopus minutus*, Christiania-fjord, p. 99.

*Socarnes*, for *Anonyx vahli* (Krøyer), = ? *Ephippiphora*, White, pp. 99 & 100.

*Hippomedon*. Mandibles short, left with small accessory tooth; palpus of maxillæ of first pair with many short teeth at tip; maxillipeds short and broad; caudal appendage long and deeply cleft. *Anonyx holbælli* (Krøyer) and *Lysianassa abyssii* (Goës), from Norway and Greenland, pp. 102 & 103.

*Cyphocaris* (Lütken, MS.). Mandibles very short, with a long and very broad palpus; palpus of the maxillæ of 1st pair with few strong teeth and a very long bristle at tip; 1st segment of the body very gibbous, nearly concealing the head; no 1st epimerum, the 3rd and 4th coalite. *C. anonyx* (Lütken, MS.), Greenland: pp. 103 & 104.

*Aristias*. Mandibles elongate, narrow, enlarged at the tip; maxillæ of 1st pair very broad. *Anonyx tumidus* (Krøyer) = *Lysianassa audouiniana* (Sp. Bate), Greenland, Norway, pp. 106 & 107.

*Anonyx liljeborgi*, Norway, p. 109.

*Onisimus*. Hypostome prominent, mandibles at the tip with a strong tooth and a narrow accessory tooth; maxillæ of 1st pair with 2 plumose bristles on tip of inner lamina. *Anonyx litoralis*, *plautus*, and *edwardsi* (Krøyer), Greenland and Norway pp. 111-113.

*Menigrates*. Mandibles very short, with short palpus; maxillæ of 1st pair with 2 plumose bristles; maxillipeds very large and short. *Anonyx obtusifrons* (Böck), Norway, pp. 113 & 114.

*Orchomena*, for *Anonyx pinguis* (Böck), *serratus* (Böck) = *edwardsi* (Sp. Bate), *minutus* (Krøyer), and *goesi*, sp. n., Norway, pp. 114-116.

*Tryphosa* [preoccupied in *Lepidoptera*], for *Anonyx nanus* (Kröyer), *longipes* (Sp. Bate), and *horingi*, sp. n., pp. 117-119.

*Normania*, for *Opis quadrimana* (Sp. Bate), pp. 119 & 120.

*Priscilla*, allied to *Pontoporia*, but the anterior epimera with long plumose bristles, and feet of 1st and 2nd pair almost equal. *P. armata*, Norway, p. 124.

*Argissa*, also allied to *Pontoporia*: upper antennæ much shorter than the lower; 1st epimerum very large; feet of 1st and 2nd pair equal, feeble. *A. typica*, Christiania-fjord, p. 125.

*Bœckia*, g. n. Epimera primi paris ab iis secundi paris occulta, hæc omnium maxima. Carpus pedum secundi paris valde elongatus, manus perbrevis, vix prehensilis. Pedes quinti, sexti, septimi paris longitudine sensim accrescentes; articulus primus paris septimi parum dilatatus. Pedes saltatorii perbreves, aculeis validis armati. Appendix caudalis perbrevis, postice leviter emarginata, non vere fissa. Lamina interior maxillæ primi paris elongata, perparum lata, extremitate setis nonnullis prædita. Pedes maxillares elongati; lamina exterior angusta, margine interiore dentibus elongatis instructo; articuli palpi graciles. *B. typica*, sp. n., Malm, Öfv. Vet. Ak. 1870, pp. 543-546, pl. 5. fig. 1, Bohuslän, S. Sweden.

*Stegocephalus christianiensis*, sp. n., Böck, l. c. p. 128.

*Andania*, g. n. Allied to *Stegocephalus*; mandibles without teeth at tip; palpus of maxillæ of 1st pair elongated, 2-jointed; caudal appendage entire, very small. *A. abyssi* and *nordlandica*, spp. nn., Norway: *id. l. c.* pp. 128 & 129.

*Amphilochus odontonyx*, *bispinosa* [sic], and *tenuimanus*, spp. nn., Norway: *id. l. c.* pp. 130 & 131.

*Gitana*, g. n. Allied to *Amphilochus*; 3rd joint of mandibular palpi shorter than 2nd; palpus of maxillæ of first pair single-jointed; hands narrow, scarcely subcheliform. *G. sarsi* and *rostrata*, spp. nn., Norway: *id. l. c.* p. 132.

*Astyra*, g. n. Also allied to *Amphilochus*; maxillipeds with a very large many-toothed external lamina. *A. abyssi*, sp. n., Hardanger-fjord, Norway: *id. l. c.* p. 133.

*Harpina*, g. n. Allied to *Phoxus*; palpus of 1st pair of maxillæ 2-jointed. *H. (Phoxus) plumosus* (Kröyer) and *crenulata*, sp. n., Norway, *id. l. c.* pp. 135 & 136.

*Urothoe marinus* [sic] (Sp. Bate) is described by Grube, Mittheil. &c. p. 55, pl. 2. fig. 4, from the French N. coast.

*Metopa*, g. n. Allied to *Stenothoe* (Dana); mandibular palpus short, 3-jointed; palpus of 1st pair of maxillæ 1-jointed. *M. (Leucothoe) clypeata* and *glacialis* (Kröyer), *M. (Montagua) alderi* (Sp. Bate), and *bruzelii* (Goës), and *affinis*, *longicornis*, *megachir*, *longimana*, and *nasuta*, spp. nn., Norway fjords: Böck, l. c. pp. 140-145.

*Cressa*, g. n. Also allied to *Stenothoe*; mandibular palpus elongate, 3-jointed; upper antennæ much thicker and longer than lower. *C. schioedtei* and *minuta*, spp. nn., Norway: *id. l. c.* pp. 145 & 146.

*Syrrhoe levis*, sp. n., Norway, *id. l. c.* p. 148.

*Bruzelia*, g. n. Allied to *Tiron* (Lillj.) = *Tessarops* (Norman). Mandibles very thick, broad, pyramidal, notched at tip; body subdepressed, with prominent epimera; caudal appendage long, entire. *B. typica*, sp. n., fjords of Norway: *id. l. c.* pp. 149 & 150.

*Pardalisca abyssi*, Norway, *id. l. c.* p. 152; *bœcki*, Malm, l. c. p. 547, pl. 5. fig. 2, Koster I., S. Sweden (and Böck, l. c., Norway): spp. nn.

*Halice*, g. n. Allied to *Pardalisca*; head small, not swollen; front beak

elongate; lower antennæ with very long peduncle. *H. abyssi* and *grandicornis*, spp. nn., fjords of Norway: Böck, *l. c.* pp. 152 & 153.

*Tritropis*, new name for *Amphitonotus* (Costa, 1851), type *Oniscus aculeatus* (Lepechin, 1778) = *Talitrus edwardsi* (Sabine); *T. helleri*, sp. n., Norway, *id. l. c.* pp. 158 & 159.

*Ædiceros borealis*, sp. n., Greenland and Finmark, *id. l. c.* pp. 162 & 163.

*Acanthostephia*, g. n. Allied to *Ædiceros*; body keeled, posterior abdominal and postabdominal segments prolonged into long spines. Type, *Amphitonotus malmgreni* (Goës): *id. l. c.* p. 163.

*Monoculodes grubei*, *longicornis*, *kræyeri*, *packardi*, *tenuirostratus*, *tuberculatus*, *borealis*, and *latimanus*, spp. nn., Norway: *id. l. c.* pp. 165-169.

*Halimelon*, g. n. Allied to *Monoculodes*, carpus of 1st and 2nd pair of feet elongate. *H.* (*Ædiceros*) *brevicalcar* (Goës), and *mælleri*, *saussurii*, and *longimanus*, spp. nn., *id. l. c.* pp. 169 & 170.

*Pontocrates*, g. n., = *Kræyeria* (Sp. Bate, *partim*); feet of 1st pair very strong, those of 2nd with a very long cheliform hand. *Kræyeria norvegica* (Sp. Bate) and *haplocheles* (Grube, 1864) = *levicarpa* (Sp. Bate, 1869): *id. l. c.* pp. 171 & 172.

*Halicrion*, g. n. Allied to *Ædiceros*; maxillipeds with very small laminae and very long palpus. *H. longicaudatus*, sp. n., Norway, *id. l. c.* p. 173.

*Paramphithoe parva*, sp. n. Norway, *id. l. c.* p. 177.

*Acanthozone*, new name for *Acanthosoma* (Owen), type *Oniscus cuspidatus* (Lepechin, 1778) = *Acanthosoma hystrix* (Owen), *id. l. c.* p. 184.

*Dexamine heibergi*, sp. n., Norway, *id. l. c.* p. 187.

*Lampra*, g. n., allied to *Dexamine*, for *Atylus gibbosus* (Sp. Bate), *id. l. c.* p. 188.

*Atylus nordlandicus*, sp. n., Nordland, Norway, *id. l. c.* p. 193; *A. falcatus*, Metzger, xxi. JB. Ges. Hann. p. 28, German Sea, E. Friesland, 22 fath.: spp. nn.

*Pontogenia*, g. n., for *Atylus inermis* (Krøyer, Sp. Bate), Böck, *l. c.* p. 194.

*Halirages*, g. n., for *Atylus bispinosus* (Sp. Bate), *Amphithoe fulvocincta* (Sars), and *H. borealis*, sp. n., Norway, *id. l. c.* pp. 194-196.

*Amphithopsis malmgreni* and *longimana*, spp. nn.; Norway, *id. l. c.* pp. 199 & 200.

*Chidippides*, g. n., for *Dexamine tricuspis* (Krøyer, Sp. Bate), *id. l. c.* p. 201.

*Laothoes*, g. n. 3rd joint of mandibular palpus very broad, equal to half length of 2nd. *L. meinerti*, sp. n., Norway, *id. l. c.* p. 202.

*Gammarus lacustris*, sp. n., Smith, Am. J. Sc. (3) ii. p. 453, Lake Superior.

*Elasmopus latipes*, sp. n., Christiania-fjord, *id. l. c.* p. 212.

*Melphidippa*, g. n., for *Gammarus spinosus* (Goës), and *M. longipes* and *borealis*, spp. nn., Norway, *id. l. c.* pp. 218 & 219.

*Ampelisca assimilis*, *dubia*, and *propinqua*, spp. nn., Norway, *id. l. c.* pp. 222, 224, 225.

*Haploops setosa*, sp. n., Bergen, Norway, *id. l. c.* p. 228.

*Byblis*, g. n., for *Ampelisca gaimardi* (Krøyer); 3rd joint of mandibular palpus much shorter than 2nd: *id. ibid.*

*Goestia*, g. n. Allied to *Leptochirus*; body subdepressed, flagellum of upper antennæ obsolete, 2nd pair of feet stronger but not much longer than 1st. *Autonoe depressa* (Goës), Spitsbergen, *id. l. c.* p. 231.

*Photis luetkeni*, sp. n., *id. l. c.* p. 233.

*Xenoclea*, g. n. Allied to *Microprotopus*; upper antennæ with 3rd joint of the peduncle elongate, without accessory flagellum; last pair of saltatory feet 2-branched. *X. batii*, sp. n., Norway, *id. l. c.* pp. 234 & 235.

*Autonoe plumosa*, sp. n., Christiania-fjord, *id. l. c.* p. 239.

*Protomedea longimana*, sp. n., Norway, *id. l. c.* p. 240.

## DOMICOLÆ.

*Synamphithoe longicornis*, sp. n., Norway, *id. l. c.* p. 245.

*Podocerus megacheir*, sp. n., Norway, *id. l. c.* p. 247.

*Janassa*, new name for *Jassa* (Bruzel.), = *Podocerus variegatus* (Leach), *id. l. c.* p. 250.

*Cerapus longimanus*, sp. n., Norway, *id. l. c.* p. 252.

## COROPHIIDÆ.

*Siphonæcetes colletti*, Norway, *id. l. c.* p. 258; *S. cuspidatus*, Metzger, xxi. JB. Ges. Hann. p. 30, German Sea, E. Friesland, 16 fath. : spp. nn.

*Glaucanome kroeyeri* and *steenstrupi*, spp. nn., Norway, *id. l. c.* pp. 259 & 260.

## DULICHIIDÆ.

*Dulichia nordlandica*, *tuberculata*, and *curticauda*, spp. nn., Norway, *id. l. c.* pp. 263 & 264.

*Paradulichia*, g. n. Antennæ much shorter, saltatory feet of the last pair with only one very small branch. *P. typica*, sp. n., Hardanger-fjord, Norway, *id. l. c.* p. 265.

*Lætmatophilus spinosissimus*, sp. n., Hardanger-fjord, *id. l. c.* p. 266.

*Xenodice*, g. n. Inner lamina of 2nd pair of maxillipeds with several bristles; upper and lower antennæ subequal, with short multiarticulate flagella. *X. frauenfeldti*, sp. n., Hardanger-fjord, *id. l. c.* pp. 266 & 267.

## HYPERIIDÆ.

*Hyperia medusarum* (Müll.) = *latreillii* (M.-E.) = *oblivia* (Krøyer) = *Hiella orbignii* (Strauss) = *Lestrigonius exulans* (Krøyer) = *L. kimahani* (Sp. Bate), and *H. spinipes* (Boeck), both Norwegian, described: *id. l. c.* pp. 85 & 86.

*Metæcus abyssorum*, sp. n., *id. l. c.* p. 86, Norway.

*Parathemisto*, g. n. Allied to *Themisto*; feet of 3 last pairs nearly equal, 4th joint of 3rd and 4th pairs scarcely dilated. *P. (Themisto) compressa* (Goës) and *P. abyssorum*, sp. n., from the fjords of Norway, *id. l. c.* p. 87.

*Themisto libellula* (Mandt, 1822) = *arctica* (Krøyer) = *crassicornis* (*id.*), and *bispinosa*, sp. n., both Arctic, *id. l. c.* p. 88.

*Tryphana*, g. n. Distinguished from the other *Hyperiidæ* by the absence of mandibular palpi, the rudimentary maxillæ, and the 3-jointed upper antennæ. The author forms for it a separate family, *Tryphanidæ*. *T. malmii*, sp. n., Hardanger-fjord, Norway, *id. l. c.* pp. 88 & 89.

## LÆMODIPODA.

## CAPRELLIDÆ.

*Caprella loveni*, sp. n., *id. l. c.* p. 276, Norway.

## CYAMIDÆ.

LÜTKEN (Dan. Selsk. Skr. 1870, pp. 279 & 280) gives a conspectus of the known boreal spp. of this family, characterizing the following new genus and spp. &c. :—

*Platygyamus*, g. n. 1st segment of body distinct from head; 1st pair of feet nearly equal to 2nd. *P. (Cyamus) thompsoni* (Gosse) from the "Dögling" (*Chenocetus rostratus*), p. 279.

*Cyamus mysticeti* from the Right Whale, *monodontis*, sp. n., from the Narwhal, *boopis (ceti)*, O. Fabr.) from *Megaptera boops, nodosus = ceti* (Zool. Dan.) from the Narwhal, and *globicipitis*, sp. n., from the Grindwhal (*Globiceps*), are specifically distinguished, p. 280.

## ISOPODA.

## ASELLIDÆ.

*Asellus cavaticus*, sp. n., found in the cave of Falkenstein, Wirtemberg, shortly indicated by Leydig, JH. Ver. Würt. xxvii. p. 269.

*Asellus tenax*, sp. n., Smith, Am. J. Sc. (3) ii. p. 453, Lake Superior.

## CYMOTHOIDÆ.

HERKLOTS (Arch. Néerl. v.) characterizes the following 2 new genera (indistinctly) and species:—

*Epichthys giganteus*, pp. 3-8, figs. 1-9, 95 millims. long. Probably from the Indian Archipelago. Nearly allied to *Anilocra* (Leach).

*Ichthyozenus jellinghausi*, pp. 9-17. Parasitic on a freshwater fish of the family *Cyprinidæ*, *Puntius maculatus* (Bleeker), in Java.

## PHYLLOPODA.

## APODIDÆ.

*Apus cancriformis* and *productus*. The sexual differences and relations of these spp. have been the subject of careful researches by VON SIEBOLD (*cf. supra*), who states that in the ♀ the transformation of the 11th pair of feet to egg-bearing organs, accompanied by abortive development of the gills, begins in individuals in which the dorsal shield measures only 5 millims., whereas in the ♂ the same pair of feet remains similar to the others, and that the sexes can consequently be distinguished with certainty from that age by the mere inspection of this pair of feet. The males are stated to be somewhat smaller than the females.

*Apus lucasanus* (♂ and ♀), Kansas, *newberryi*, Utah, *æqualis* (♂ and ♀), Matamoras, and *himalayanus* (more nearly allied, by the length of the shield, to the European *cancriformis* than the other spp.), R. Sutlej, Himalayas, spp. nn. Packard, in "Preliminary Notice of new North-American Phyllopoda," Am. Journ. Sc. ii. 1871, pp. 109-111, and Ann. N. H. (4) viii. pp. 333-335.

## BRANCHIPODIDÆ.

*Streptocephalus texanus*, sp. n., *id.* Am. Journ. Sc. ii. 1871, p. 112, and Ann. N. H. (4) viii. p. 335, Texas.

*Artemia salina*. VON SIEBOLD (*l. c.* pp. 197-210) maintains that this animal is by no means hermaphroditic, but the males are very distinguishable, though exceedingly rare, there being in some localities and seasons only females, which propagate by parthenogenesis. The organ which was supposed by

Joly (1840) to be a testicle, is, according to v. Siebold, a gland, which produces the shell of the egg. He thinks that *Artemia* may be kept distinct from *Branchipus* by the different and more rudimentary formation of its tail, and that under the name *A. salina* several different species, or at least races, have been confounded.

## LIMNADIIDÆ.

*Limnadia hermanni*. The males are hitherto unknown, all described as belonging to that sex by Leydig, Koch, S. Fischer and Chyzer proving to belong to other genera, especially *Estheria*. The summit or umbro of the shell, distinctly perceptible in the latter, is not distinguishable in *Limnadia*. v. Siebold, *l. c.* pp. 210-214.

*Limnadia texana*, sp. n., Packard, Am. Journ. Sc. ii. 1871, p. 113, and Ann. N. H. (4) viii. p. 336, Texas.

*Estheria belfragii*, Texas, and *morsii*, Iowa, spp. nn., *id. l. c.* pp. 114, 116, & 336 & 337.

*Limnetis gracilicornis*, sp. n., Texas, *id. l. c.* pp. 116 & 337.

## CLADOCERA.

*Leptodora hyalina* (Lilljeborg, 1860) = *Hyalosoma dux* (Wagner, 1868; Zool. Rec. vii. p. 199), = *Polyphemus kindti* (Focke, in the political newspaper "Weserzeitung," Bremen, 22 Sept. 1844); and both sexes of it are known: v. Siebold, *l. c.* pp. 220-222.

## OSTRACODA.

## CYPRIDIDÆ.

*Potamocypris*, g. n., Brady, Tr. North. Durh. iii. pt. 2, pl. 12. [In a paper "On bivalve Entomostraca," not seen by the Recorder.]

*Xiphochilus* [preoccupied in *Pisces*], g. n., *id. l. c.* pl. 14.

*Candona brachyura*, Heller, Verh. Ver. Innsbr. i. p. 93, pl. 2, Tyrol.

## CYPRIDINIDÆ.

The species living in the European seas are reviewed by Brady, P. Z. S. 1871, pp. 289, 295. They are 12, distributed in the genera *Cypridina* (M.-E.), *Bradycinetes* (Sars), *Philomedes* (Lillj.), and *Asterope* (Phil.) = *Cylindroleberis* (Brady). The following are described and figured:—

*Bradycinetes brenda* (Baird) = *globosa* (Lillj.) = *Ast. grænlandica* (Fischer), Greenland, Norway, Northumberland, Bay of Biscay, p. 292, pl. 26. fig. 6; *Philomedes interpuncta* (Baird) = *longicornis* (Lillj.), Britain and Norway, p. 293, pl. 26. figs. 1-5; *folini*, sp. n., Bay of Biscay, p. 294, pl. 27.

## ENTOMOSTRACA.

## CYCLOPIDÆ.

*Cyclops clausi*, p. 73, figs. 1 & 2, *grelleri*, p. 74, figs. 3 & 4, Tyrol, Heller, *l. c.* pl. 1: spp. nn.

## SIPHONOSTOMA.

OLSSON has published two papers under the titles "Prodrömus faunæ Copepodorum parasitantium Scandinaviæ" (Act. Lund. v. pp. 1-49, 2 pls.), and "Nova Genera parasitantia Copepodorum et Platyelminthium" (*l. c.* vi. pp. 5 & 6, 1 pl.), the contents of which will be noticed *infra*.

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## ARGULIDÆ.

*Argulus phezini*, sp. n., Tübingen, S. Germany, indicated by Leydig, JH. Ver. Württ. xxvii. p. 269.

## CALIGIDÆ.

*Caligus curtus* (Müll.) = *bicuspidatus* (Nordm.) = *elegans* (Bened.), on various species of fishes, chiefly *Gadidæ*; *C. belones* (Kröy.), ♂ described; *C. rapax* (M.-E.?, Steenstr.) = *gurnardi* and *lumpi* (Kröy.), on *Trigla*, *Acanthias*, *Molva*, *Chimæra*, &c., described by Olsson, l. c. pp. 5-10; larva of the last figured, pl. 1. figs. 1 & 2.

*Lepeophthirus hippoglossi* (Kröy.), *pectoralis* (Müll.), *branchialis* (Malm), and *salmonis* (Kröy.), described, id. l. c. pp. 11-14.

*Trebius caudatus* (Kröy.), on *Raja batis*, id. l. c. p. 14; larva, figs. 3 & 4.

*Nogagus socialis*, sp. n., Skagerrack, on *Acanthias vulgaris*, id. l. c. p. 16, pl. 1. fig. 5.

*Echthrogaleus perspicax*, sp. n., on *Acanthias vulgaris*. ♂ little known, agreeing with *Nogagus*; ♀ described: id. l. c. pp. 18-20, pls. 1 & 2. figs. 6 & 7.

*Pandarus bicolor* (Leach), on the same shark, described, id. l. c. p. 21, pl. 2. fig. 8.

*Cecrops latreillii* (Leach) on the gills of *Mola nasus*, id. l. c. p. 22.

HESSE, Ann. Sci. Nat. (5) xv., describes the following new genera and species:—

*Megalobranchinus suboculatus* from gills of *Mugil capito*, p. 2, pl. 1. figs. 1-7.

*Macrobanchinus punctatus* from gills of *Chrysophrys aurata*, p. 6, pl. 1. figs. 8-15.

*Hæma[to]philus roseus* from gills of *Motella vulgaris*, p. 9, pl. 1. figs. 16, 17.

*Metoponaphrissontes ornatus* from gills of *Scombrex camperi*, p. 12, pl. 2. figs. 1-6.

*Metopocatacotinus hirsutus* from gills of *Belone vulgaris*, p. 15, pl. 2. figs. 7-10.

*Megasanoirus bimaculatus*, probably from a compound *Ascidia*, *Polychinum constellatum*, p. 17, pl. 2. figs. 11-17.

[The genera of the above, all new, are so verbosely described that no distinctive characters can be given for them: some of the names, moreover, transgress the well-known Linnæan canon, and are too long for practical use.]

*Doropygus cristatus* and *postremoglobosus* from *Ascidia canina*, pp. 21 & 23, pl. 2. fig. 18.

*Botryllophilus propinquus* from a compound *Ascidia*, p. 25.

*Ceratrichodes flavus* from a social *Ascidia*, p. 27.

*Biocryptus calthæus* from a compound *Ascidia*, p. 29.

## DICHELESTIDÆ.

*Eudactylina acuta* (Bened.), from the gills of *Acanthias vulgaris*, described, id. l. c. p. 24, pl. 2. fig. 9.

*Clavella hippoglossi* (Cuv.), ♀ redescribed, id. l. c. pp. 25 & 26.

*Peniculus clavatus* (Müll. nec Kröy.), from *Sebastes*, described; nearly allied to *Clavella*, but anterior antennæ wanting: id. l. c. pp. 27 & 28, pl. 2. figs. 10 & 11.

## CHONDRACANTHIDÆ.

*Chondracanthus cornutus* (Müll.) in the branchial cavity of several spp. of *Pleuronectes*; *C. annulatus*, sp. n., from the gills of *Raja batis*; *C. gurnardi* (Kröy.), *merlucii* (Holt.), *lophi* (Johnst.), and *nodosus* (Müll.), the last from *Sebastes*. ♂ and ♀ of all these described, id. l. c. pp. 29-35: the new sp. figured pl. 2. figs. 13-15.

*Lamippe rubra* (Bruzel.), S. Sweden, from the cavity of *Pennatula rubra*. Adult specimens described, *id. l. c. vi. p. 6*, pl. 1. figs. 4 & 5.

*Enalcyonium*, g. n. Corpus feminae elongatum, segmentis nullis vel (in adulto) minus distinctis. Antennae anteriores fere triarticulatae, articulo ultimo elongato, subulato. Rostrum nullum. Maxillipedum triarticulatum duo paria. Rudimenta pedum abdominalium in junioribus. Appendices caudales juniorum trifurcae, adularum indivisae, crassae. Allied to *Lamippe*. *E. rubicundum*, sp. n., Bohuslän, S. Sweden, from *Aleyonium digitatum*, on the slime of which it feeds, *id. l. c. vi. p. 5*, pl. 1. figs. 1-3.

## LERNÆOPODIDÆ.

*Lernæopoda edwardsi*, new name for *L. salmonea* (Mayor, M.-E., nec Krøy.), and *L. longimana*, subsp. n., allied to *L. gadi* (Krøy.), from gills of *Raja fullonica* and *batis*: *id. l. c. v. pp. 36 & 38*, pl. 2. figs. 18-22.

*Vanbenedenia krøyeri* (Malm), ♂ & ♀ described, *id. ibid. pp. 39 & 40*, pl. 2. figs. 16 & 17.

*Charopinus dalmani* (Retz.), from the nostrils and gills of *Raja batis*: *id. ibid. p. 41*.

*Brachiella rostrata* (Krøy.), from *Hippoglossus*, ♂ and young ♀; and *B. obesa* (*Lernæopoda*, Krøy.), from the mouth of *Trigla gurnardus*: described, *id. ibid. pp. 41-44*.

*Anchorella rugosa* and *emarginata* (Krøy.), both from *Anarrhichas*, and scarcely distinct: *id. ibid. pp. 44 & 45*.

LERNÆIDÆ (*Pennellidæ*).

This family consists rather of analogous than of absolutely allied forms, the males and the shape of the ovisac being different. *Medesicastes*, *Lestira*, and even *Silenium* may be removed to the *Chondracanthidæ*; *Penella* and *Lernæa* to the *Dichelestidæ*: *id. ibid. pp. 45 & 46*.

*Lernæenicus spratti* (Sow.)=*monilaris* (M.-E.), and *L. encrasicoli* (Turt.), from the eye and pectoral fin of *Chupea sprattus*, very closely allied, described, *id. ibid. pp. 46 & 47*.

*Lernæa branchialis* (L.). A few remarks concerning a specimen found on *Labrus mixtus*: *id. ibid. p. 48*.

A Lernæan species, living on the blind fish, *Amblyopsis*, in the Wyandotte Cave, is indicated by Cope in the Indianapolis Journal, Sept. 5, 1871 [*cf.* Ann. N. H. (4) viii. p. 369].

## XIPHOSURA.

A. S. PACKARD (P. Am. Ass., reprinted in Q. J. Micr. Sci. (2) xi. pp. 263-267, and also abstracted, with figures, in Am. Nat. iv. pp. 498-502) has published a paper "On the Embryology of *Limulus polyphemus*," in which the development of that sp. is elaborately discussed. The eggs are laid in great numbers loose in the sand, the ♂ fertilizing them after they are dropped. The primitive bud is confined to a minute area, and rests on the top of the yolk, as in the Spiders and *Crustacea* without metamorphosis. In the first stage, 3 pairs of rudimentary limbs are observed, the most anterior representing the false mandibles of Savigny, and being situated just in front of the mouth-opening. In a second stage, there are 6 pairs of appendages, increasing in

size from the head backwards, and the whole embryo covers but about a third of the visible portion of the yelk. Subsequently, the 5 pairs of legs increase in size, and are doubled on themselves, while the mandibles remain very small, and 2 pairs of gills make their appearance. At a little later period, about the middle of embryonic life, the embryo throws off an embryonic skin (*Nauplius-skin*). Still later, the claws are developed, the heart appears, the abdominal part of the dorsal portion grows broader, with the segments more distinct. Just before hatching, the cephalothorax spreads out, the 2 eyes and the pair of ocelli are distinct, the 6 segments of the cephalothorax can, with care, be distinguished, the 9 abdominal segments are most clearly defined, but only a rudimentary spine has appeared on the coxal joint, corresponding to the numerous teeth in after life, and the whole embryo bears a very near resemblance to certain genera of Trilobites, as *Trinucleus* and *Asaphus*. In about 6 weeks from the time the eggs are laid, the embryo hatches, the segments are obliterated, the abdominal spine is very rudimentary, forming the 9th segment. The young animal swims briskly up and down the receptacle in which it is placed, skimming about on its back by flapping the gills, not bending the body. At the succeeding moult, between 3 and 4 weeks after hatching, the abdominal spine becomes ensiform, and about thrice as long as broad. A second moult occurs about 4 weeks afterwards.

This author also discusses the morphology of *Limulus* (Proc. Bost. Soc. N. H. Oct. 1870, and Am. Nat. iv. pp. 754-756); he regards the anterior part of the shield as cephalothorax, and the posterior as abdomen—features which distinguish it from all recent adult *Crustacea*, but agreeing with the *Zoea*-stage of some of them and with the Trilobites.

Lockwood has observed the habits (feeding, spawning, and moulting) of *Limulus polyphemus*, and compares it morphologically with *Eurypterus* and *Pterygotus* (Trilobites). Am. Nat. iv. pp. 257-273, pl. 3.

## CIRRIPEDIA.

### PELTOGASTRIDÆ.

*Sacculina*. Anderson (P. Z. S. 1871, p. 144) notes the occurrence in the Andaman Islands, Bay of Bengal, on *Thalamita crenata*, of a species apparently not distinct from that found in Europe.

## ARANEIFORMIA.

### PYCNOGONIDÆ.

*Nymphon pumilio*, sp. n., Grube, JB. schles. Ges. xviii. p. 85, St. Malo; the hinder pair of palpi without denticulated spines.

*Phoxichilus levis*, sp. n., *id. ibid.* and Mittheil. &c. pp. 31 & 50, pl. 1. fig. 1, St. Malo.

## ARACHNIDA

BY

The Rev. O. P. CAMBRIDGE, M.A., C.M.Z.S.

BLACKWALL, JOHN. Notice of Spiders captured by Miss Hunter in Montreal, Upper Canada; with descriptions of Species supposed to be new to Arachnologists. Ann. N. H. (4) Dec. 1871, pp. 429-436.

Records 9 species of various genera, 5 species being described as new.

CAMBRIDGE, O. P. Notes on some Arachnida collected by Cuthbert Collingwood, Esq., M.D., during rambles in the China Sea &c. P. Z. S. 1871, pp. 617-622, pl. xlix.

Records 12 species of *Araneidea* of various genera, 2 species being described as new; also two species of different genera of *Scorpionidea*, and one of *Phalangidea*.

CAPELLO, F. DE BRITO. Especies novas ou pouco conhecidas d'Arachnidios d'Africa occidental. Jorn. Sc. Lisb. i. pp. 79-88, pl. ii.

Describes 2 new species, of different genera, of *Araneidea*, and records several others.

EMERTON, J. H. Flying Spiders. Amer. Nat. v. pp. 148-155.

An interesting paper on the mode in which Spiders are transported from place to place by means of their own threads. Extracts are given from the works of Darwin, Blackwall, and Murray, showing the different theories proposed to account for the facts relating to this subject.

HASSELT, A. W. M. Araneæ exoticæ quas collegit pro Musco Lugdunensi medicus militaris primi ordinis Ludeking, E. W. A., ex India orientali (Java). Tijdschr. Ent. (2) 1871, pp. 172-178.

Records known species of the following families:—*Epeirides* 31, *Agelenides* 1, *Pholcides* 1, *Lycosides* 5, *Thomisides* 6, *Attides* 13, *Mygalides* 2, *Dysderides* 2; and ends with "N.B. Plures harum diagnosium, Attidum præcipue, adhuc magis minusve incertæ sunt habendæ."