

Colour: sides with several widely placed vertical brown bands or patches, within which are one or two conspicuous white spots; a bluish-white stripe before the axilla.

One specimen in the collection of the British Museum, from Costa Rica, obtained of Mr. Higgins.

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XXXIII.—*On the Invertebrate Marine Fauna and Fishes of St. Andrews.* By W. C. M'INTOSH.

[Continued from p. 207.]

Series II. ARTHROPODA.

Class CRUSTACEA.

The sessile-eyed Crustacea of St. Andrews are tolerably numerous both in species and individuals. Between tide-marks the most conspicuous (as usual) are the swarms of *Talitrus locusta* which speedily reduce dead fish and other animals to skeletons at high-water mark and considerably beyond it, and the multitudes of *Gammarus locusta* and *Amphithoë podoceroïdes* under stones amongst the rocks. The *Podocерides*, *Pherusa bicuspis*, *Calliopius grandoculis*, and *Caprella tuberculata* are plentiful in the rock-pools, and *Corophium grossipes* in the brackish pools near the estuary of the Eden. *Janira maculosa* abounds both in the tidal region and in deep water, while *Jera Nordmanni* occurs in numbers under stones near high-water mark. In the laminarian region one of the most abundant, perhaps, is *Atylus Swammerdami*, which congregates in swarms on the loose seaweeds. *Siphonæcetus typicus* is common amongst shell-gravel, and *Eurydice pulchra* on the surface of the sea as well as in rock-pools in autumn. Many of the rarer forms occur in the deeper water in considerable numbers; but the distribution of the group in British seas is still involved in considerable obscurity; and at present it will suffice to observe that two of the most plentiful in this region are *Ampelisca Belliana*, Bate, and the new *Calliopius bidentatus*, Norman. The former is likewise common on the beach after storms and in the stomachs of fishes; and the latter ranges to the laminarian zone.

Compared with the Zetlandic area, the absence at St. Andrews of such forms as *Acanthonotus Owenii*, *Dexamine vedlomensis*, *Cymodocea truncata*, and *Sphæroma Prideauxia-*



*num* in the laminarian region strikes even a superficial observer of the group; while the large number of rare and new species which were met with during the frequent dredgings of Mr. Gwyn Jeffreys and the Rev. A. M. Norman still further heightens the contrast. The southern region, again, is boldly separated by the presence in large numbers of *Cymodocea truncata* and *Sphæroma Prideauxianum* in the fissures of rocks between tide-marks, and *Dynamene* in rock-pools. The characteristic *Tanais vittatus*, *Paranthura costana*, *Næsa bidentata*, *Mæra grossimana*, *Chelura terebrans*, *Conilera cylindrica*, and the large *Cymothoa* parasitic on the fishes at once distinguish the fauna of the Channel Islands from that at St. Andrews. The rarity of *Orchestia littorea* at the latter and its abundance in the tidal region of the Outer Hebrides is another interesting contrast.

Many of the sessile-eyed Crustacea, such as *Talitrus locusta*, are extremely hardy. *Gammarus locusta* is often found in putrid localities, and it survives almost every other marine form in putrid vessels in confinement. The group as a whole is composed of extremely active animals; and even the most grotesque, such as *Caprella tuberculata*, are at home in the intricacies of *Ceramium* and other finely branched seaweeds. The boring forms (by jaws) are represented by *Limnoria lignorum*; but its depredations are comparatively insignificant, probably because little wood is employed within water-mark in the construction of the harbour. The perforations of *Talitrus*, again, abound in the sand, and the looped burrows of *Corophium* in the sandy mud of the flats it inhabits. The nest-forming crustaceans are represented by *Amphithoë podoceroïdes*, *Siphonæcetus typicus*, *Podocerus variegatus*, and *P. falcatus*; while the young of *Gammarus locusta* are often observed adhering to the abdominal region of the parent.

The Cirripedes occur abundantly between tide-marks, the most conspicuous being *Balanus balanoides*, which covers the bare rocky ridges opposite the Castle and other parts. In deep water the various species are attached to shells, stones, crabs, wood, cork, coal, tests of ascidians, and other structures.

I am indebted to Mr. Spence Bate for the determination of several doubtful forms, and especially to the Rev. A. M. Norman for his courteous assistance in this respect, and in revising the list. Mr. G. S. Brady kindly furnished me with the names of the Ostracoda occurring in shell-débris on the West Sands and other collections.



## Order PYCNOGONOIDEA.

Fam. **Pycnogonidæ**, Latreille.

Genus PYCNOGONUM, Brünnich.

*Pycnogonum littorale*, O. F. Müller.

Abundant under stones between tide-marks.

Genus PHOXICHILIDIUM, M.-Edwards.

*Phoxichilidium femoratum*, Rathke.

Occasionally under stones in rock-pools, and ranging to deep water.

Besides the foregoing, there are several species (one apparently identical with Mr. Goodsir's *Nymphon Johnstoni*, and another with his *N. spinosum*) not uncommon in the coralline region. Many delicate zoophytes are found on their limbs.

## Order CIRRIPIEDIA.

## Suborder SUCTORIA.

Fam. **Peltogastridæ**, Claus.

Genus PELTOGASTER, H. Rathke.

*Peltogaster paguri*, H. Rathke.Occasionally on *Pagurus bernhardus*. A more elongated form occurs on *P. cuanensis*.

Genus SACCULINA, Thompson.

*Sacculina carcini*, Thompson.Common on the abdomen of *Carcinus mænas*. Another is found on *Portunus holsatus*.

## Suborder THORACICA.

Fam. **Lepadidæ**.

Genus LEPAS, L.

*Lepas anatifera*, L.; Darwin, Mon. i. p. 73, pl. 1. f. 1.

On the bottoms of ships, and thrown ashore after storms attached to timber.



## Genus SCALPELLUM, Leach.

*Scalpellum vulgare*, Leach; Darw. Mon. i. p. 222, pl. 5. f. 15.

On *Thuiaria thuja* and *Sertularia cupressina* from deep water.

## Fam. Balanidæ.

## Subfamily BALANINÆ.

## Genus BALANUS, Lister.

*Balanus porcatus*, E. da Costa; Darw. Mon. ii. p. 256,  
pl. 6. f. 4.

Abundant on stones, *Ascidia sordida*, crabs, &c. in deep water, and occasionally between tide-marks.

*Balanus crenatus*, Bruguière; Darw. Mon. ii. p. 261, pl. 6. f. 6.

Not uncommon on *Hyas araneus*, *Lithodes maia*, and on rocks in the laminarian region.

*Balanus balanoides*, L.; Darw. Mon. ii. p. 267, pl. 7. f. 2.

Very abundant; coating extensive surfaces of the rocks between tide-marks and in the laminarian region, and adhering to mussels, sticks, posts, &c. Elongated varieties are not uncommon. The exuviae swarm in the rock-pools and on the surface of the sea in summer.

*Balanus Hameri*, Ascanius; Darw. Mon. ii. p. 277, pl. 7. f. 5.

Occasionally in deep water; a small thorn-tree (still fresh) was covered with fine examples.

## Fam. Verrucidæ.

## Genus VERRUCA, Schumacher.

*Verruca Strömii*, O. F. Müller; Darw. Mon. p. 518, pl. 21. f. 1.

Abundant on rocks and stones between tide-marks in the laminarian region, and on crabs in the coralline.

## Order COPEPODA.

## Suborder GNATHOSTOMATA.

## Genus NOTODELPHYS, Allman.

*Notodelphys ascidicola*, Allman.

Common in *Ascidia intestinalis* and others.



Suborder **PARASITA.**Genus **CALIGUS**, O. F. Müller.*Caligus rapax*, M.-Edwards.

Common on cod. Many specimens have *Udonella caligorum* attached to them. Free specimens often occur in rock-pools.

Genus **LEPEOPHTHEIRUS**, Nordm.*Lepeophtheirus salmonis*, Kröyer.

Abundant on the salmon.

Genus **CECROPS**, Leach.*Cecrops Latreillii*, Leach.

Common on the gills of the sunfish (*Orthogoriscus mola*).

Genus **ANCHORELLA**, Cuvier.*Anchorella uncinata*, O. F. Müller.

Abundant on the gills of cod and haddock.

*Anchorella emarginata*, Kröyer, Naturhist. Tidsskrift, Band i. p. 287, tab. 3. fig. 7, a-e.

On the gills of the wolf fish (*Anarrhichas lupus*). Mr. Norman states that this is new to Britain.

Genus **LERNÆA**, L.*Lernæa branchialis*, L.

Common on the gills of cod and haddock.

An *Ergasilus*? is common on the gills and other parts of *Doris tuberculata*, *D. Johnstoni*, and occasionally on *Triopa claviger*.

Order **LOPHYROPODA.**Suborder **OSTRACODA.**Fam. **Cytheridæ.**Genus **CY THERE**, O. F. Müller.

*Cythere pellucida*, Baird; G. S. Brady, Monogr. Brit. Ostracoda, Linn. Trans. xxvi. 2, p. 397, pl. 28. f. 22-26 & 28.

Abundant in shell-sand from the West Sands.



The following come from the same locality :—

*Cythere albomaculata*, Baird ; Brady, *op. cit.* p. 402, pl. 28.  
f. 33-39, pl. 39. f. 3.

*Cythere lutea*, O. F. Müller ; Brady, *op. cit.* p. 395, pl. 28.  
f. 47-56, pl. 39. f. 2.

*Cythere villosa*, G. O. Sars ; Brady, *op. cit.* p. 411, pl. 29.  
f. 28-32.

*Cythere cuneiformis*, Brady, *op. cit.* p. 404, pl. 31. f. 47-54.

*Cythere viridis*, O. F. Müller ; Brady, *op. cit.* p. 397, pl. 28.  
f. 40, 41, &c. Also from deep water.

*Cythere tuberculata*, G. O. Sars ; Brady, *op. cit.* p. 406, pl. 30.  
f. 25-41.

*Cythere concinna*, Jones ; Brady, *op. cit.* p. 408, pl. 26.  
f. 28-33 &c.

*Cythere finmarchica*, G. O. Sars ; Brady, *op. cit.* p. 410, pl. 31.  
f. 9-13.

Genus CYTHERIDEA, Bosquet.

*Cytheridea elongata*, Brady, *op. cit.* p. 421, pl. 28. f. 13-16 &c.

*Cytheridea papillosa*, Bosquet ; Brady, *op. cit.* p. 423, pl. 28.  
f. 1-6 &c.

Genus LOXOCONCHA, G. O. Sars.

*Loxoconcha tamarindus*, Jones ; Brady, *op. cit.* p. 435,  
pl. 27. f. 45-48.

Occasionally in the débris of the fishing-boats.

*Loxoconcha guttata*, Norman ; Brady, *op. cit.* p. 436, pl. 27.  
f. 40-44.

In shell-débris from the West Sands.

Genus XESTOLEBERIS, G. O. Sars.

*Xestoleberis aurantia*, Baird ; Brady, *op. cit.* p. 437, pl. 27.  
f. 34-37 &c.

Abundant in tide-pools.

Genus CYTHEROPTERON, G. O. Sars.

*Cytheropteron latissimum*, Norman ; Brady, *op. cit.* p. 448,  
pl. 34. f. 26-30.

In the débris of the fishing-boats.



## Genus CYTHERIDEIS, Jones.

*Cytherideis subulata*, Brady, *op. cit.* p. 454, pl. 35. f. 43-46.  
In shell-débris from the West Sands.

## Genus SCLEROCHILUS, G. O. Sars.

*Sclerochilus contortus*, Norman; Brady, *op. cit.* p. 455,  
pl. 34. f. 5-10 &c.

Common in débris from deep water.

## Genus PARADOXOSTOMA, Fischer.

*Paradoxostoma variabile*, Baird; Brady, *op. cit.* p. 457,  
pl. 35. f. 1-7 & 12-17.

Abundant in tide-pools and in deep water.

*Paradoxostoma ensiforme*, Brady, *op. cit.* p. 460, pl. 35.  
f. 8-11.

In the débris of the fishing-boats.

*Paradoxostoma flexuosum*, Brady, *op. cit.* p. 461, pl. 35.  
f. 30-34.

In the same locality.

*Paradoxostoma arcuatum*, Brady, *op. cit.* p. 461, pl. 35.  
f. 37 & 38.

With the foregoing from deep water.

## Order AMPHIPODA.

Group **NORMALIA**.Division *GAMMARINA*. Subdivision *VAGANTIA*.Tribe **SALTATORIA**.Fam. 1. **ORCHESTIIDÆ**.Genus **TALITRUS**, Latreille.

*Talitrus locusta*, L. Bate & Westwood, Brit. Sessile-eyed  
Crust. i. p. 16.

Abundant amongst the débris of seaweed and dead animals  
of all kinds near high-water mark, and in burrows in the sand  
even above the latter.



## Genus HYALE, H. Rathke.

*Hyale Nilssoni*, H. Rathke ; B. & W. *op. cit.* i. p. 40 (as *Allorchestes Nilssonii*).

In small pools near high-water mark on the surface of the bare rocks beyond the Maiden Rock, where almost the only vegetation is borne on the backs of the limpets, and under stones in littoral pools at the West Rocks. Stomachs of the cod and flounder.

## Tribe Natatoria.

## Fam. 2. Gammaridæ.

## Subfamily STEGOCEPHALIDES.

Genus STENOTHOË, Dana (= *Probolium*, Costa ; *Montagua*, Bate & Westwood).

*Stenothoë monoculoides*, Mont. ; B. & W. *op. cit.* i. p. 54.

In débris of fishing-boats, not uncommon. The dorsum has rows of orange or reddish-orange specks, three distinct rows on the broad plates of the anterior limbs, and other isolated spots of the same hues ; eyes orange or reddish orange, with small red dots posteriorly. A variety also occurs.

*Stenothoë marina*, Bate ; B. & W. *op. cit.* i. p. 58.

Frequent in débris of fishing-boats. Ova green.

*Stenothoë Alderi*, Bate ; B. & W. *op. cit.* i. p. 61.

With the foregoing, occasionally.

*Stenothoë pollexiana*, Bate ; B. & W. *op. cit.* i. p. 64.

In the same locality. Body barred with red ; eyes red.

*Stenothoë clypeata*, Bate ; B. & W. *op. cit.* ii. Supplement, p. 499.

Occasionally in the débris of the fishing-boats.

## Genus LYSIANASSA, M.-Edwards.

*Lysianassa atlantica*, M.-Edwards ; B. & W. *op. cit.* i. p. 82.

Not uncommon in the stomach of the haddock.

## Genus ANONYX, Kröyer.

*Anonyx Holböllii*, Kröyer, = *A. denticulatus*, B. & W. *op. cit.* i. p. 101.

Occasionally after storms on the West Sands, and in the stomachs of cod and haddock.



## Genus ACIDOSTOMA, Lilljeborg.

*Acidostoma obesum*, Bate ; B. & W. *op. cit.* i. p. 98.

Occasionally at the East Rocks.

## Genus CALLISOMA, Costa.

*Callisoma crenata*, Bate ; B. & W. *op. cit.* i. p. 120.

In the stomach of a haddock.

## Subfamily AMPELISCIDES.

## Genus AMPELISCA, Kröyer.

*Ampelisca carinata*, Bruzelius ; B. & W. *op. cit.* i. p. 127  
(as *A. Gaimardii*).

Abundant in the stomachs of cod and haddock.

*Ampelisca Belliana*, Bate (= *A. macrocephala*, Lilljeborg ?) ;  
B. & W. *op. cit.* i. p. 135.

Common in the stomachs of the cod, haddock, skate, and flounder, and dredged off the East Rocks. Nothing else is found in the distended stomachs of some haddocks except masses of this species ; or they may be accompanied by green pea-urchins, tubes of *Terebellæ*, fragments of *Ophiocomæ*, and sea-mice. In multitudes on the West Sands after some storms.

## Genus AMPHILOCHUS, Bate.

*Amphilocheus manudens*, Bate ; B. & W. *op. cit.* i. p. 180.

Occasionally in the débris of the fishing-boats. Eyes bright red ; body purplish brown, speckled with dark granules ; the tips of the antennæ are of the same purplish hue.

## Genus IPHIMEDIA, H. Rathke.

*Iphimedia obesa*, H. Rathke ; B. & W. *op. cit.* i. p. 219.

Not uncommon in pools at the East Rocks, and in débris of the fishing-boats. The brownish-red markings of the young specimens form a double row on the posterior segments.

## Subfamily GAMMARIDES.

## Genus DEXAMINE, Leach.

*Dexamine spinosa*, Mont. ; B. & W. *op. cit.* i. p. 237.

Abundant in pools near low-water mark at the East Rocks,



and in the stomach of the cod. Eyes white. Most have a straw-coloured body, very prettily mottled with brownish-red patches and many minute white specks; the antennæ are beautifully barred with white and brown.

Genus ATYLUS, Leach.

*Atylus Swammerdamii*, M.-Edwards; B. & W. *op. cit.* i. p. 246.

Occasionally in rock-pools at the pier, or clinging in hundreds to the seaweeds in the laminarian region off the West Rocks; abundant on the beach after storms, and in the stomach of the cod. Translucent and slightly yellowish, with three brownish-red spots along the dorsum, and a small one above the eyes; the latter are pinkish brown; the elongated heart pulsates very evidently on the dorsum.

*Atylus bispinosus*, Bate; B. & W. *op. cit.* i. p. 250.

In the débris of the fishing-boats, under stones at the pier rocks, and on the West Sands after storms. Eyes occasionally reddish. Most of the body and appendages are speckled with small black dots; many have specks of a carmine hue behind the eyes.

Genus PHERUSA, Leach.

*Pherusa bicuspis*, Kröyer; B. & W. *op. cit.* i. p. 253.

In the débris of the fishing-boats, and in swarms in the fine pools near high-water mark beyond the Rock and Spindle.

Genus CALLIOPIUS (Leach), Lilljeborg.

*Calliopijs læviusculus*, Kröyer; B. & W. *op. cit.* i. p. 259.

Occasionally in pools near low water at the East Rocks.

*Calliopijs Ossiani*, Bate; B. & W. *op. cit.* i. p. 261.

Frequent in the fishing-boats.

*Calliopijs grandoculis*, Bate; B. & W. *op. cit.* i. p. 265.

In the same locality, and not uncommon in the rock-pools. Many show a decided brownish bar from the eyes along the dorsal ridge; and sometimes small reddish specks are present. A. Boeck includes this form under *C. læviusculus* \*.

\* 'Crustacea Amphipoda borealia et arctica,' p. 117.



*Calliopius bidentatus* (n. sp.), Norman, Nat. Hist. Trans.  
Northumb. & Durham, vol. i. 1865, p. 24.

This species is frequently dredged off the Harbour and the East Rocks, as well as in the deeper water outside the bay, and found on the West Sands after storms. Mr. Norman states that it is not uncommon all along the east coast.

The body is about two fifths of an inch long, of a pale straw-colour, tinted with brownish at the joints and the bases of the limbs. Superior antennæ twice as long as the inferior, beautifully banded with red. Eyes irregularly rounded, brownish red or pale brick-red. The first and second gnathopods are nearly equal (the second, however, being larger) and similar in structure. Hand almond-shaped, the palm being furnished with a series of very distinct stout spines, and a row of smaller spines reaching the base of the finger; the latter is long, boldly curved, and regularly divided on the concave side. The first and second pleopods have spines, that of the former, however, being sometimes indistinct. A very characteristic convexity occurs at the junction of the third and fourth pleopods; and the dorsal margin of the latter is concave.

#### Genus LEUCOTHÖE, Leach.

*Leucothoe spinicarpa*, Abildgaard; B. & W. *op. cit.* i. p. 271  
(as *L. articulosa*).

Occasionally in pools at the East Rocks, and on the West Sands after storms.

#### Genus AORA, Kröyer.

*Aora gracilis*, Bate; B. & W. *op. cit.* i. p. 281.

Not uncommon in the débris of the fishing-boats. One had a spike beneath the second pair of gnathopoda.

#### Genus MICRODEUTEROPUS, Costa.

*Microdeuteropus Websteri*, Bate; B. & W. *op. cit.* i. p. 291.

In the stomach of a haddock, and in débris of the fishing-boats. Body of a straw-colour, the antennæ having lighter and darker bands of the same hue; eyes round, black.

#### Genus BATHYPOREIA, Lindström.

*Bathyporeia pilosa*, Lindström; B. & W. *op. cit.* i. p. 304.

Common off the East Rocks in the laminarian region.



*Bathyporeia Robertsoni*, Bate ; B. & W. *op. cit.* i. p. 309.

Occasionally in pools at the East Rocks. The eyes in the examples were large, nearly meeting in the middle line.

Genus MELITA, Leach.

*Melita palmata*, Mont. ; B. & W. *op. cit.* i. p. 337.

In the débris of the fishing-boats ; not common. The body is yellowish or straw-colour, with pale brownish antennæ marked at the joints with pale rings ; eyes dark brown or black, with whitish specks.

*Melita obtusata*, Mont. ; B. & W. *op. cit.* i. p. 341.

From the fishing-boats ; not uncommon.

Genus GAMMAROPSIS, Lilljeborg.

*Gammaropsis erythrophthalmus*, Lilljeborg ; B. & W. *op. cit.* i. p. 354.

From the fishing-boats ; not rare.

Genus AMATHILLA, H. Rathke.

*Amathilla Sabini*, Leach ; B. & W. *op. cit.* i. p. 361.

A single example in the stomach of a haddock.

Genus GAMMARUS, Fab.

*Gammarus marinus*, Leach ; B. & W. *op. cit.* i. p. 370.

In the stomach of a cod, and occasionally off the East Rocks in a few fathoms.

*Gammarus locusta*, L. ; B. & W. *op. cit.* i. p. 378.

In swarms below the flat stones on sand between tide-marks and in the laminarian region. It swims a considerable time amongst putrid water. Occurs frequently in the stomachs of cod and haddock.

Genus HEISCLADIUS, B. & W.

*Heiscladius longicaudatus*, B. & W. *op. cit.* i. p. 412.

In the fishing-boats ; rare.



## Subdivision DOMICOLA.

## Fam. Corophiidæ.

## Subfamily PODOCERIDES.

## Genus AMPHITHOË, Leach.

*Amphithoë rubricata*, Mont.; B. & W. *op. cit.* i. p. 418.

In the débris of the fishing-boats.

*Amphithoë podoceroïdes*, H. Rathke; B. & W. *op. cit.* i. p. 422  
(as *A. littorina*).

Common in the laminarian region, and under stones between tide-marks, where it constructs tubes or nests. Most of the fine specimens have the hand of the second pair defined by a distinct tooth, as Rathke and Dr. Johnston state.

## Genus PODOCERUS, Leach.

*Podocerus falcatus*, Mont.; B. & W. *op. cit.* i. pp. 436 & 447 (as  
*P. pulchellus* and *P. pelagicus*).

In rock-pools on *Ceramium rubrum* at the Pier, in the laminarian region beyond, in the stomachs of flounders, and in the fishing-boats. Sometimes gaudily tinted with reddish brown and white, and with red bars on the inferior antennæ.

*Podocerus variegatus*, Leach; B. & W. *op. cit.* i. p. 439, & p. 442  
(as *P. capillatus*).

Not uncommon in pools near low-water mark at the East Rocks.

## Genus CERAPUS, Say.

*Cerapus difformis*, M.-Edwards; B. & W. *op. cit.* i. p. 457.

Common in deep water. The straw-coloured body is marked with dark grains; and the superior antennæ have the basal third of the second and third segments tinted of a crimson hue, the flagellum being similarly coloured for its proximal half; the eyes have black centres and, as usual, a pale margin.

## Genus SIPHONÆCETUS, Kröyer.

*Siphonæcetus typicus*, Kröyer; B. & W. *op. cit.* i. p. 465.

Abundant in the laminarian region in 3 to 6 fathoms off the East Rocks, where it constructs nests on the inner surface of bivalve shells. *S. Whitei*, Gosse, is probably the female of this species.



Genus *NÆNIA*, Bate.

*Nænia tuberculosa*, Bate ; B. & W. *op. cit.* i. p. 472.  
Occasionally in the débris of the fishing-boats.

*Nænia rimapalmata*, Bate ; B. & W. *op. cit.* i. p. 474.  
With the former.

*Nænia excavata*, Bate ; B. & W. *op. cit.* i. p. 476.  
Common in the same débris from the coralline ground.

Subfamily *COROPHIIDÆ*.Genus *COROPHIUM*, Latreille.

*Corophium grossipes*, L. ; B. & W. *op. cit.* i. p. 493 (as *C. longicornis*).

Abundant in the brackish pools near the mouth of the Eden, and occasionally at the West Rocks. It is common in July : swims excellently on its back.

Division *HYPERINA*.Fam. *Hyperiidæ*.Genus *HYPERIA*, Latreille.

*Hyperia medusarum*, O. F. Müller ; B. & W. *op. cit.* ii. p. 12  
(as *H. galba*).

Common in the cavity of *Aurelia aurita* ; each medusa had six or eight large examples. The *Lestrignus Kinahani*, Bate, is a sexual variety (male). Some large specimens are found swimming freely on the surface of the water.

*Hyperia obliqua*, B. & W. *op. cit.* ii. p. 17.  
In a tide-pool on the West Sands after a storm.

Group *ABERRANTIA*.Fam. *Caprellidæ*.Genus *ÆGINA*, Kröyer.

*Ægina phasma*, Mont. ; B. & W. *op. cit.* ii. p. 45.  
Abundant in the débris of the fishing-boats.



## Genus CAPRELLA, Lamarck.

*Caprella linearis*, L.; B. & W. *op. cit.* ii. p. 52.

Plentiful in the same locality.

*Caprella lobata*, O. F. Müller; B. & W. *op. cit.* ii. p. 57.

Frequent in the fishing-boats.

*Caprella tuberculata*, Guérin; B. & W. *op. cit.* ii. p. 68.

Common on *Ceramium rubrum* in rock-pools, and in the stomachs of cod and haddock.

*Caprella hystrix*, Bate; B. & W. *op. cit.* ii. p. 63.

Not uncommon in the fishing-boats. The Rev. A. M. Norman does not think this is the *C. hystrix* of Kröyer, but rather the *C. septentrionalis* of that author.

## Order ISOPODA.

## Group ABERRANTIA.

## Tribe VAGANTIA.

## Genus ANCEUS, Risso.

*Anceus maxillaris*, Mont.; B. & W. *op. cit.* ii. p. 187.

Not uncommon in the débris from the coralline ground.

## Division AQUASPIRANTIA.

## Tribe PARASITICA.

## Fam. BOPYRIDÆ.

## Genus PHRYXUS, H. Rathke.

*Phryxus paguri*, H. Rathke; B. & W. *op. cit.* ii. p. 240.

Occasionally on *Pagurus bernhardus*.

## Fam. ÆGIDÆ.

## Genus CIROLANA, Leach.

*Cirolana spinipes*, M.-Edw.; B. & W. *op. cit.* ii. p. 299.

A large specimen occurred in the stomach of a haddock.



## Genus EURYDICE, Leach.

*Eurydice pulchra*, Leach ; B. & W. *op. cit.* ii. p. 310.

Abundant on the surface of the sea off the East Rocks in autumn, and in the stomachs of cod and haddock.

## Tribe LIBERATICA.

## Fam. Asellidæ.

## Genus JÆRA, Leach.

*Jæra Nordmanni*, H. Rathke ; B. & W. *op. cit.* ii. p. 320.

Common under stones near high-water mark at the East Rocks.

## Genus JANIRA, Leach.

*Janira maculosa*, Leach ; B. & W. *op. cit.* ii. p. 338.

Frequent on shells and *Filigrana* from the coralline ground, and under stones in pools near low water at the East and other rocks. This species has many of the habits of *Idotea*.

## Genus LIMNORIA, Leach.

*Limnoria lignorum*, Rathke ; B. & W. *op. cit.* ii. p. 351.

Abundant in the stakes for the salmon-nets on the West Sands, and in wood elsewhere.

## Fam. Arcturidæ.

## Genus ARCTURUS, Latreille.

*Arcturus longicornis*, Sowerby ; B. & W. *op. cit.* ii. p. 365.

Common in the stomachs of cod, haddock, and flounders.

*Arcturus gracilis*, H. Goodsir ; B. & W. *op. cit.* ii. p. 373.

Abundant in débris from the coralline ground and in the stomachs of haddocks.

## Fam. Idoteidæ.

## Genus IDOTEA, Fab.

*Idotea tricuspidata*, Desmarest ; B. & W. *op. cit.* ii. p. 379.

Frequent near low water in the laminarian region, and in the stomachs of all the common fishes.

*Ann. & Mag. N. Hist.* Ser. 4. Vol. xiv.



*Idotea linearis*, Pennant; B. & W. *op. cit.* ii. p. 388.

Common in 3 or 4 fathoms on sand near the bar of the Eden, in the trawlers' boats, and in the stomachs of the common fishes. They are active swimmers.

Messrs. Bate and Westwood state that I sent *Cymodocea truncata*, Mont., from St. Andrews; but this is doubtful. The specimens probably came from the Outer Hebrides.

### Division **AEROSPIRANTIA.**

Fam. **Oniscidæ.**

Genus **LYGIA**, Fab.

*Lygia oceanica*, L.; B. & W. *op. cit.* ii. p. 444.

Abundant at the margin of high water at the East Rocks.

A specimen of *Porcellio scaber* occurred in the stomach of a cod.

Order **CUMACEÆ.**

Fam. **Diastylidæ.**

Genus **DIASTYLIS**, Say.

*Diastylis Rathkii*, Kröyer.

Common off the East Rocks in 3 to 4 fathoms, and in the stomach of the cod, haddock, and flounder.

[To be continued.]

XXXIV.—“Eozoon” *examined chiefly from a Foraminiferal Stand-point.* By Professors W. KING, Sc.D., and T. H. ROWNEY, Ph.D.

[Plate XIX.]

LIKE most scientific men, it has been the lot of Dr. Carpenter, in the course of his career, to be placed under the necessity of defending certain of his views against the opposition of others. But unlike many who could be named, and who have risen above petty personal feelings, he does not scruple to speak of his opponents, or discuss their arguments, in a way ill-befitting any





M'Intosh, William Carmichael. 1874. "XXXIII.—On the invertebrate marine fauna and fishes of St. Andrews." *The Annals and magazine of natural history; zoology, botany, and geology* 14, 258–274.

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