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Report on the Crustacea. By the Rev. A. M. Norman, Burnmoor Rectory, Fence Houses, Co. Durham.

This Report was received by the late Sir C. Wyville Thomson in November 1880.

Mr. Norman says :—"I send a list; it is a very interesting one. No. 8 was a grand haul, the best I have ever examined from the North Atlantic. It leads off with a species (*Bythocaris Payeri*, Heller) discovered by the German Arctic Expedition. The second (*Hymenodora glacialis*, Bucholz) was discovered in the Austrian Arctic Expedition, and there follow several of the species of the Norwegian Expeditions. You will see that there are three or four things which I take to be new; one of these, the *Nephropsis*, is not unlike *Nephrops norvegicus*, but the arms quite different, not angled, and hairy, and the eye rudimentary.

Station 1.

Munida rugosa, Fabr.

Station 3.

Stenorhynchus longirostris, Fabr.
Hyas coarctatus, Leach.
Ebalia tuberosa, Pennant.
Munida rugosa, Fabr.
Ligia oceanica (this must have been from Shore).
Eurydice truncata, Norman.
Scalpellum vulgare, Leach.

Station 4.

Munida tenuimana, G. O. Sars.
Nephropsis atlantica, n. sp.

Station 5.

Dorhynchus thomsoni, Norman.
Amathia carpenteri, Norman.
Munida tenuimana, G. O. Sars
Two or three Amphipods (small) to be examined.

Station 6.

Geryon tridens, Kröyer.
Munida tenuimana, G. O. Sars.

Station 7.

Amathia carpenteri, Norman.
Munida tenuimana, G. O. Sars.
Eurydice polydendrica, Norman and Stebbing (MS.).
Haploops setosa, Boeck.
Ampelisca compacta, n. sp.
One or two more Amphipods to be examined.

Station 8.

Bythocaris payeri, Heller.
Hymenodora glacialis, Bucholz.
Boreomysis insignis, G. O. Sars.
Diastylis Josephinæ, G. O. Sars.
„ *longipes*, G. O. Sars.
Cyclaspis longicaudata, G. O. Sars.
Eurycope gigantea, G. O. Sars.
„ *cornuta*, G. O. Sars.
Anonyx lagena, Kröyer.
Atylus carinatus, Fabricius.
Eusirus cuspidatus, Kröyer.
Halirages elegans, n. sp.
Haploops setosa, Boeck.
Ægina spinosissima, Stimpson.

Nephropsis atlantica, Norman, n. sp.

Carapace finely granulated and pubescent all over, with strongly marked transverse lines; rostrum rather longer than the peduncle of the upper antennæ, its extremity acute, its sides bearing two pairs of strong spines; a third pair of spines is situated at its base, and a fourth pair on the front of the carapace over the insertion of the exterior antennæ. The spines just described are the largest, but there are also on the central portion of the carapace two rows of about six spines each, of which the foremost is the largest, while the others are very small, these rows pass backward from the central portion of the base of the rostrum; there is another and strong spine on a line with and behind the spine which is situated on each side of the base of the rostrum.

Pleon having the segments furnished with a slight central keel dorsally; the epimera of the first segment not produced downwards, those of the four following segments, greatly produced downwards triangularly, and gradually attenuating, end in sharp spine-like points, the anterior margins of the epimera of the second segment furnished with a single acute anteally directed spine; epimera of the sixth segment with two small spine-like points, one directed downwards, the other backwards over the insertion of the outer uropods; telson quadrate, the extremity truncated, bearing two divergent ridges which terminate at the distant corners in spine-like points; uropods gently rounded at their extremities, each with two raised ridges, one central, the other running along the outer margin and terminating in strong spines; there is also a spine on the upper surface of the basal joint.

Eyes minute, and apparently devoid of lenses, of a pink colour, lying close together and touching each other, being situated directly under the rostrum, by which they are entirely concealed, and resting on the upper antennæ.

Upper antennæ, which are furnished with two flagella as in allied genera, have the first and third joint subequal in length, and the middle joint about half their length; the flagella are about half as long again as the peduncle.

Lower antennæ are, in the specimen procured, imperfect, but the peduncle is short, equal in length to that of the upper antennæ; green gland with a conspicuous opening on the under side of the basal joint.

Chelipeds densely setose; with rounded joints, which present no appearance of angularity; the meros, which is the largest joint, does not quite reach the extremity of the rostrum; it bears a single spine at the extremity of the upper and outer margin, and another on the under surface; carpus furnished with three spines on the inner and one on the outer margin, and one on the under surface; hand unarmed, elongate, ovate, finger and thumb acute, with crenated inner margin, their tips crossing when closed.

The two following pairs of feet chelate, their coxæ furnished on the inner margin with large lobes, that of the third pair having a hook-shaped process on the outer side of the extremity of this lobe.

First pair of pleopods elongate, spatulate, porrected between the

bases of the pereiopods, adpressed closely to the body, and reaching the coxæ of the third pair.

Length $3\frac{1}{2}$ inches. Length of chelipeds rather more than 2 inches.

"Knight Errant" August 10, 1880. Station 4; in 555 fathoms.

Mr. Wood Mason (*Journal Asiatic Society of Bengal*, vol. xiii. 1873; and *Ann. Nat. Hist.* ser. 4, vol. xii. 1873, p. 59), established the genus *Nephropsis* in 1873 for the reception of a small lobster-like crustacean which he procured in 260–300 fathoms off Ross Island, on the coast of the Andamans. The genus approaches very closely to *Nephrops*, but differs from it in the absence of the antennal scale of the lower antennæ. In 1880 Mr Spence Bate procured a second species, *Nephropsis cornubiensis*, off the Cornish Coast (*Report Brit. Assoc.*, 1880, p. 160), and mentioned that he had in his hands a third species taken during the "Challenger" Expedition in 700 fathoms, south of New Guinea, and a fourth, procured also by the "Challenger" in 800 fathoms off Bermuda, and remarked that "the resemblance of all four species is very close, and the distinction of one from the other is dependent chiefly upon the modified forms of more or less important parts." In the same year Professor A. Milne Edwards described (*Ann. des Sci. Natur.*, vi. 9) *Nephropsis Agassizii* from 1500 meters, coast of Florida, but this description I have not seen; and almost at the same time Mr. S. I. Smith characterised (*Proc. National Museum, Washington*, vol. iii. p. 431) yet another form, *Nephropsis aculeatus*, which was taken off the coast of the United States in 100–126 fathoms. The foregoing description of *N. atlantica* was drawn up in November 1880, and the "Knight Errant" specimen was at the same time returned to Sir Wyville Thomson, and I have not since seen it. Comparing the description with that subsequently published by Mr. Smith, there is the strongest suspicion that they are the same species; but all the forms seem to be very closely allied, if indeed distinct. Mr. Smith describes the carapace of *N. aculeatus* as "showing no difference whatever" from *N. stewartii* except in having rather a longer rostrum. Now the spiny armature of *N. atlantica* is certainly different from that assigned to *N. stewartii*, and therefore I do not feel justified in assigning the "Knight Errant" specimen to *N. aculeatus*, though at the same time I very unwillingly give it a name.

Boreomysis nobilis, G. O. Sars.

Boreomysis nobilis, G. O. Sars, "Crustacea et Pycnogonida Nova in itinere 2do et 3tio Expeditionis Norvegicæ anno 1877 et 1878 collecta," *Archiv. for Mathematik og Naturvidenskab*, 1880, p. 428.

Animal more or less mottled and suffused with red, younger specimens are paler in colour, but apparently the telson is always red. Rostrum horizontal, very acute, nearly as long as the eye when porrected. Antero-lateral corner of carapace produced into a triangular process projecting over the base of the inferior antennæ; hinder margin of carapace excavated in the centre, and there exposing the last segment of the pereion. Eyes rather flattened, broad, reaching slightly beyond the side of the carapace, having a small tubercle on the inner side of the peduncle and just below the well-developed dark-coloured eye itself. Upper antennæ having the second joint of the peduncle short, not half the length of the third, and not so patelliform as is usual in this genus. The lower antennæ have the scale much elongated, narrow, and gradually tapering, twice the length of the peduncle of the upper antennæ, its outer margin plain with a small spine at the apex; the apex slopes at once towards the inner margin and together with that margin is setose. Telson long, but not quite reaching the end of the inner uropods, which show no trace of an acoustic organ, and much shorter than the outer, excavated above, and cleft to about one-fifth of its length, its sides unarmed for half their length, but their distal half set with numerous (about 30) slender, closely-arranged, subequal spines, the cleft portion of the telson closely denticulated. Length about 65 millemetres.

Several specimens taken at Station 8, in 540 fathoms.

The above description was drawn up in 1880, when the specimens came into my hands. On comparison with the description published shortly afterwards by my friend Professor Sars, there can be no doubt of the identity of the "Knight Errant" example with the single male which was dredged by the Norwegian Expedition in 1878 in 459 fathoms, 79° 0′ 59″ N. lat., 5° 40′ E. long. I may add to my original description that the tarsus of the legs is composed of three articulations, as in the type specimen of Sars.

Ampelisca compacta, Norman, n. sp.

Pleon not keeled, a very slight depression across the middle of the fifth segment, hind margin of that segment with a spine-like point, but not largely developed nor upturned. Upper antennæ exceeding the length of the peduncle of the lower by about a length equal to the last joint of that peduncle, flagellum consisting of ten articulations; lower antennæ much longer than the upper, and having the two last joints of the peduncle subequal to each other. Eyes apparently altogether absent. First two pairs of pereiopods with the last joint about equal to the two preceding combined. The last pereiopods have the basos with the posterior lobe well developed reaching to the end of the ischium, the lower margin truncate and slightly concave; ischium equal in length to the two following joints combined, meros short, carpus rather longer, manus not quite equal to the two preceding joints combined, dactylus half the length of manus; the lower joints are all flattened but simple (not produced downwards as in *A. lævigata*). First two pairs of uropods of the same length, subequal in length to the deeply cleft telson, and reaching to about one-fourth the length of the sparingly-ciliated branches of the last uropods; the outer margin of the outer branch of the second uropods bears two spines, and under a high power of the microscope is seen to be minutely crenulated. The entire animal has a rounded compact appearance, and is about 8 millemetres long.

A single specimen. Station 7; 530 fathoms.

Halirages elegans, Norman, n. sp.

Pereion and pleon not carinated, two last segments of the former and two first of the latter bearing a single central dorsal spine-like process, which is small on the first of these segments (and sometimes absent), but increases in size on each of the succeeding segments; fourth segment of pleon with a deep transverse sulcus. Lower and front angles of the head produced into an acute spine-like process; epimera of first and second pereion segments with serrated margins, the first also produced forwards into a sharp angle, rounded behind, the second rounded before and behind. Lower margin of the pleon segments not serrated, bearing rows of rather distant seta-like spines

a little within the borders, the second and third segments angled at the hinder corner, and the third also produced into a small spine-formed point, and the posterior margin not waved but finely crenated. Antennæ of both pairs very long, the upper pair as long as the entire animal, peduncles of both pairs remarkably round and smooth, peduncle of the upper pair reaching nearly to the end of the penultimate joint of that of the lower; the first joint large, round, and smooth, with two distal spines on the lower side; the second joint nearly as long as, but only half the thickness of, the first; the third very small. Peduncle of the lower antennæ having the two distal joints subequal in length. All the legs slenderly built, the two gnathopods small and slender, the hand shorter than the wrist, subquadrate, slightly widening from the base to the palm, which is only slightly oblique. Last uropods of great length, more than equal the combined length of the three posterior segments of the pleon, the peduncle not quite reaching to the end of the telson, rounded, smooth, with two distal spines above, branches narrow, round, smooth, margined with spinules, and about twice as long as the peduncle. Telson lanceolate, hollowed above, quite smooth, and not furnished with any spines, apex tridentate, the centre tooth large, the laterals small, the tridentate apex is formed by the telson itself (not by articulated spines).

Length 1 inch. Station 8, 540 fathoms.

This species comes very near to *Halirages quadridentatus*, G. O. Sars,* but differs from his description in the form of the epimera of the first segment of pereion, and in the third segment of pleon. Sars does not describe the telson, which is very characteristic.

Report on the Pycnogonida. By Dr. P. P. C. Hoek.

From Station 3 there is one male *Pycnogonum littorale*, Ström, spec.

From Station 5 two specimens of *Nymphon strœmii*, Kröyer.

From Station 7 two specimens of the same species, and still ten other individuals were dredged at Station 8.

* "Prodromus descriptionis Crustaceorum et Pycnogonidarum, quæ in expeditione Norvegica, anno 1876, observavit G. O. Sars," *Archiv. for Mathematik og Naturvidenskab*, 1876, p. 357.

The species, an extremely large quantity of which was obtained at Station 8, is the *Nymphon robustum*, Bell, the very same, of which Professor Wyville Thomson published a highly characteristic drawing in his *Depths of the Sea*, under the name of *N. abyssorum*, A. M. Norman.

I got large quantities of the same species from different dredging stations in the Barents Sea; in general the specimens from this locality are larger and stouter than those from the "Knight Errant." The same remark may be made with regard to the specimens of N. *strœmii*, dredged during the cruise of the "Knight Errant," Station 8, and those obtained by the Dutch schooner "Willem Barents" in higher northern latitudes. From the same station (8) a single specimen of *N. grossipes*, Oth. Fabr., and numerous *N. macronyx*, Prof. G. O. Sars, were obtained. The last named species is a very interesting one, which, till now, I knew only from the description of Prof. G. O. Sars. More than forty specimens I picked out from the three bottles with *N. robustum*.

As far as I know the cirriped on the *N. robustum* is new to science. It is a Scalpellum species, for which I propose the name, *Scalpellum nymphocola*.*

As for the large Pycnogonid, four specimens of which were dredged also at station 8, it is *Collossendeis proboscidea*, Sabine, spec., a species by no means rare in the cold area of higher northern latitudes. I will include these species in my Pycnogonid memoir; of *N. robustum*, Bell, *N. strœmii*, Kröyer, and *Collossendeis proboscidea*, Sabine, I prepared detailed descriptions for the narrative of the "W. Barents" cruise; so I will give only their names and a very short notice in my "Challenger" publication. (See Hoek Report Pycn. "Chall.," p. 94–99.)

Report on the Polyzoa. By Dr. Geo. Busk, F.R.S.

Station 1; 305 fathoms. A few fragments of rock, on which were minute colonies of

* A description of this species, with the necessary figures, will be given in my report on the Cirripedia of the Expedition of H.M.S. "Challenger."

1. *Lepralia granifera*, B. M. Cat.

? Microporella impressa, Audouin ; Hincks, in a highly calcified condition.

Station 2 ; 375 fathoms. Numerous pebbles and fragments of rock :—

1. *Lepralia* (*Alysidota*) *alderi*, Bk.
2. „ *granifera*, B. M. Cat.
3. „ *polita*, Norman.
4. „ *dutertrei*, Aud.

Lep. woodiana, Bk.

Lep. dutertrei, Hincks.

5. *Alecto granulata*, B. M. Cat.

Stomatopora granulata, Hincks.

? 6. *Diastopora obelia.*

? 7. *Discoporella hispida*, B. M. Cat.

Lichenopora hispida, Hincks.

Both the latter very small and much worn, so as to be scarcely recognisable.

Station 3 ; 53 fathoms.

1. *Cellepora ramulosa*, Linn.
2. *Cellepora avicularis*, Hincks.
3. *Eschara compressa*, Sowerb. (sp.).

Cellepora cervicornis, Fleming ; Couch ; Busk ; Sars ; Alder ; &c.

Eschara cervicornis, formâ.

Eschara, Smitt ; D'orb ; Hincks.

Millepora compressa, Sowerb.

Porella cervicornis, Gray.

Porella compressa, Gray ; Hincks.

4. *Bugula flabellata*, J. V. T. (sp.)

Flustra avicularis, Sow.

Flustra angustiloba, Lamk.

Avicularia flabellata, J. V. T.

Bugula flabellata, B. M. Cat. ; Hincks, &c.

Bugula avicularia, formâ, 2. *flabellata*, Smitt.

5. *Bugula plumosa*, Pallas (sp.)

Bicellaria plumosa, Blain N.

Bugula plumosa, B. M. Cat.; Alder ; Heller ; Hincks, &c.

6. *Flustra foliacea*, Linn. (sp.)
   Eschara foliacea, Linn. Ed. 10.
   Flustra foliacea, Linn. Ed. 12; Solander; B. M. Cat.; Auctt.

7. *Retepora beaniana*, King.
   Retepora cellulosa (pars) Anett.
   Retepora beaniana, King; B. M. Cat.; Hincks, &c.
   Retepora cellulosa, formâ.
      beaniana, Smitt.
   Eschara beaniana, Smitt. 1878.

8. *Salicornaria farciminoides.*
   Sal. farciminoides, Solander; B. M. Cat.; Cuvier; Auctt.
   Eschara and *Flustra fistulosa* (pars), Linn.
   Cellaria salicornia, Lamx; Lamarck, &c.
   Cellaria fistulosa, Searles Wood; Hincks; Smitt, &c.

9. *Lepralia unicornis* var. *ansata*, B. M. Cat.; Auctt.
   Schizoporella unicornis, Hincks.

10. *Porella levis*, Fleming (sp.)
   Cellepora levis, Fleming.
   Eschara teres, Bk.
   Eschara levis, Sars.
   Porella levis (*Eschara* formâ), Smitt; Hincks.

The 17 species above enumerated include 13 Cheilostomata and 3 or 4 Cyclostomata. The latter are remarkable for their small size and strongly calcified condition; as were also some of the Lepralioid forms.

All are well-known northern forms, and none present any peculiarities worthy of remark, except that the two species of *Bugula* are represented by very luxuriant specimens. The condition also under which the specimens of *Porella levis* occurred was rather curious; the two or three fragments were, so to speak, enclosed in, and at first sight continuous with, the ramifications of *Cellepora ramulosa*, and were of the same diameter, so that at the first glance the growth appeared to be formed of two distinct kinds of cells.

All the species, it may be remarked, range as far south as the Mediterranean.

Report on the Annelida. By Dr. M'Intosh, F.R.S.

This Report was received by the late Sir C. Wyville Thomson in November 1880.

Station 1.

Placostegus tridentatus, J. C. Fabr.

Station 3.

Lagisca propinqua, Mgn.
Evarne, n. sp.
Glycera capitata, Œrsted.
Onuphis bilineata, Baird.
Lumbriconereis fragilis, O. F. M.
Ditrypa arietina, O. F. M.
Serpula vermicularis, L.

Station 4.

Empty chitinous tube, probably the same as one filled with ova (molluscan ?) from Canada.

Station 5.

Evarne johnstoni, M'I.
Several Nemerteans (*Enopla* and *Anopla*).

Station 6.

Small *Nothria*, and empty muddy tubes probably pertaining to the Ampharetidæ.

Station 7.

Aphrodita aculeata, L.
Lætmonice filicornis, Kbg.
Leanira hystricis, Ehlers.
Maldane near *sarsi*, Mgn.
Ampharete arctica, Mgn.
Hydroides norvegica, Gunn.
Protula, fragt.

Station 8.

Eunoe equitis, n. sp.
Nephthys longisetosa, Œrst.
Nothria hyperborea, Hansen.
Trophonia, n. sp.
Thelepus circinatus, Fabr.

Sabella, fragt.
Nemertes, n. sp.
Phascolosoma.

Station 10. ?
Tomopteris onisciformis.

Report on the Holothurioidea. By Dr. Hjalmar Théel.

This Report was received by the late Sir C. Wyville Thomson in November 1880.

Lætmogone violacea, Théel (*Preliminary Report on the Holothuridæ of H.M.S. "Challenger,"* vol. i.; *Bihang Till K. Sv. Vet. Akad. Handl*, Bd. 5, No. 19, Stockholm, 1879, p. 11).

Station 4, 555 fathoms. Several hundred specimens.
Station 5, 515 fathoms. One specimen.
Station 6, 630 fathoms. One specimen.

It is a somewhat surprising and highly interesting fact that this beautiful animal should be found in abundance in a locality so far from Australia (Station 164, lat. 34° 8′ S., long. 152° 0′ E.) where the two specimens hitherto known were dredged up during the "Challenger" expedition, at a depth of 950 fathoms. Moreover, it is impossible to discover any characteristic by which these almost antipodal specimens may be distinguished one from the other.

Some species of Elasipoda vary a good deal in the number and size of the processes and pedicels; in *Lætmogone violacea* as well as in *Oneirophanta mutabilis*, Théel, and *Lætmogone wyville thomsoni*, Théel, this variation is so great that scarcely any one individual resembles another completely. Many forms of Elasipoda appear to congregate in very great numbers on the deep-sea bottoms, walking together in large flocks. During the "Challenger" expedition it was not uncommon to procure at the same time and in the same locality a great many individuals of the same species, sometimes a hundred or more; and this very summer Mr. Murray has found several hundred individuals of *Lætmogone violacea* living together in the same place.

The Elasipoda are essentially deep-sea forms. With few exceptions all hitherto discovered genera and species of this order belong to