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### XX.—On the Mollusca collected during the Arctic Expedition of 1875-76

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and ventral, constructed much as in *Necrosia salmanazar*, *N. maculicollis*, and *N. sparaxes*, in all three of which also the sixth ventral segment is furnished at its hinder extremity with a peculiarly shaped process, which serves as the *point d'appui* for the claspers of the male during copulation. Legs long and stout; the fore tibiæ and the femora and the tibiæ of the two posterior pairs subtriquetrous and carinate along the middle of the under surface. Tegmina oval, with but a slight compressed conical elevation of the carina. Wings reaching about to the end of the fifth abdominal segment; the costal area luteous brown, like the body and legs; the costal vein divided at the middle of its length, the two branches uniting again near the extremity; posterior area milk-white, conspicuously tessellated with dark smoky-quartz-colour, all the transverse veinlets being broadly and distinctly margined on each side with this colour.

Total length 3 inches 7 lines; head 3·25 lines, prothorax 2·5, mesothorax 7·25; abdomen 1 inch 8 lines + 4 = 2 inches; antennæ 2 inches 5 lines; wings 1 inch 10 lines; tegmina 5·5 lines; fore femur 12·75 lines, tibia 14·5, tarsus 6·75; intermediate femur 8·5 lines, tibia 9·5, tarsus 5; posterior femur 13·5 lines, tibia 14, tarsus 5·75.

*Hab.* Southern slopes of the Khasi hills.

Closely allied to *N. salmanazar*, Westw. (Monogr. Phasm. p. 153, pl. xvi. fig. 6), ♀, from the Philippines.

Calcutta, June 26, 1877.

XX.—*On the Mollusca collected during the Arctic Expedition of 1875–76.* By EDGAR A. SMITH, Zoological Department, British Museum.

THE chief interest attaching to the Mollusca obtained during the Arctic Expedition arises from the collections being made at localities further north than any which had been previously investigated.

It is somewhat disappointing, considering that unexplored regions were searched, that only a single new form was procured.

The entire collection consists of thirty-four species. This may appear a very small number; but the difficulty experienced in collecting in such northern climates in a great measure accounts for such small results. It by no means proves that there is any great scarcity of molluscan life in the regions investigated. In all probability, further research will discover

many more known forms, thus showing that the fauna northward does not change very materially from that existing further south in Davis Straits.

In the report of the 'Valorous' Expedition, Dr. Gwyn Jeffreys gives it as his opinion that the molluscan fauna of West Greenland is rather European than American. On the contrary, the small collections brought home by the present expedition lead to an exactly opposite conclusion; for, of the thirty-four species obtained, at least sixteen are found off the Atlantic coast of the United States, whilst only four or five have been recorded from European seas, and the remainder, as far as our present knowledge extends, are exclusively Greenlandic.

Great praise is due to the two naturalists of the expedition, Captain H. W. Feilden, of H.M.S. 'Alert,' and Mr. H. C. Hart, of the 'Discovery,' for the careful manner in which the particulars regarding the specimens are preserved. To save repetition, the exact position of the principal stations at which Mollusca were dredged is here appended:—

Dumb-bell Harbour, 82° 30' N. lat.

Discovery Bay, 81° 41' N. lat.

Dobbin Bay, Grinnel Land, 79° 40' N. lat.

Franklin-Pierce Bay, 79° 25' N. lat.

#### I. GASTROPODA.

##### *Pleurotoma (Bela) violacea*, Mighels & Adams,

Proc. Bost. Soc. Nat. Hist. 1841, i. p. 50; Boston Journal of Nat. Hist. 1842, p. 51, pl. 4. f. 21; Gould, Invert. Mass. 1870, p. 353, f. 622 (as *Bela violacea*).

*Defrancia Beckii*, Möller, Naturhist. Tidsskrift, 1842, p. 86.

*Pleurotoma granlandica*, Reeve, Conch. Icon. f. 343 (from type).

Var. = *Defrancia cylindracea*, Möller, l. c. p. 85.

„ = *Defrancia livida*, Möller, l. c. p. 87.

„ = *Pleurotoma borealis*, Reeve, l. c. fig. 277.

*Hab.* Discovery Bay, 5 fathoms (*Feilden*).

Only one rather elongated specimen was obtained.

##### *Fusus (Sipho) tortuosus?*, Reeve,

Belcher's Last Arctic Voyage, vol. ii. p. 394, pl. 32. f. 5 a, b.

? *Buccinum Sabini*, Gray, Parry's Voy. 1821, p. 240.

Var. ? = *Fusus spitzbergensis*, Reeve, Belcher's Last Arctic Voyage, ii. pl. 32. f. 6 a, b.

*Hab.* Shore of Hayes Sound, 79° N. lat. (*Feilden*); Dobbin Bay, 30 fms. (*Hart*).

It is with considerable doubt that I associate the two specimens from the above localities with this species, as their form

is very different from the type shell as delineated in Reeve's figure; here the aperture, together with the basal canal, has a length of exactly half the shell, whilst in one of the specimens before me it occupies more than three fifths of the entire length. The second specimen is intermediate with regard to this character; and this induces one to conclude that the differences in length of the mouth and canal and the proportion of them to the height of the spire are not at all reliable characters in this group of the genus. In other respects there seems to be no difference, the sculpture and epidermis being of precisely the same character.

In Dr. Gray's collection there is a tablet containing some specimens of this species labelled *Sabinii*; but none of them can be his type, for all are larger than the dimensions given; and it must ever remain uncertain whether his species is undoubtedly the same as *F. tortuosus*. Dr. Gwyn Jeffreys considers that the same species is described by Gray and Reeve, and among the synonyma gives *F. spitzbergensis*, Reeve, *F. ebur*, *F. togatus*, and *F. Pfaffi*, described by Mörch. The first of these is, in all probability, merely a strongly sculptured form of this species; and the others are only known to me from description.

*Buccinum hydrophanum*, Hancock.

Ann. & Mag. Nat. Hist. 1846, xviii. p. 325, pl. 5. fig. 7; Reeve, Conch. Icon. vol. iii. f. 103.

*Tritonium grönlandicum*, Chemn., var. *a*, Mörch, Mollusc. Grönlandiæ, 1857, nos. 94-5.

*Tritonium hydrophanum*, Hancock, Mörch, Arctic Manual, 1875, p. 128. no. 106.

*Hab.* Franklin-Pierce Bay (*Feilden* and *Hart*); Dobbin Bay, 30 fms. (*Hart*).

This species varies considerably with regard to the length of the spire, as may be seen by comparing the figures by Hancock and Reeve. The convexity of the whorls is likewise subject to much variation, the examples from the above localities having them remarkably rotund, more so than Hancock's figure represents them. This author describes the epidermis, "pale yellow;" and Reeve gives it, "pale green;" and some young specimens from Dobbin Bay, the only ones possessing the epidermis, have it of a brownish olive colour.

This species has also been obtained from the west coast of Davis Straits and at Olrik, 200-300 fms. (*Mörch*).

*Buccinum Belcheri*, var.,

Reeve, Belcher's Last Arctic Voyage, vol. ii. p. 394, pl. 32. f. 7 *a*, *b*.

Shell ovately conical, very thin, purplish brown, with a few

paler streaks here and there; whorls  $5\frac{1}{2}$ , very convex, spirally distinctly ridged, the ridges being alternately larger, longitudinally rather coarsely striated by the lines of growth, and very obsoletely plicated; mouth irregularly ovate, large, occupying more than half the entire length of the shell, of the same colour as the exterior, terminating inferiorly in a short, slightly recurved canal; columella oblique, scarcely arcuated, smooth, shining, whitish towards the base; epidermis thin, olivaceous, and laminated slightly on the principal distinct incremental lines or raised lirulæ; operculum circularly ovate, with the nucleus rather central.

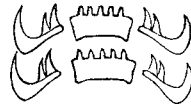
Length 33 millims., diam. 17; aperture 19 millims. long and 11 wide.

*Hab.* Dobbin Bay, 30 fms. (*Hart*).

The dentition of the animal of this species closely resembles that of *Buccinum grœnlandicum* and *Nepitunea antiqua*, as represented by Troschel's figures in his work 'Das Gebiss der Schnecken,' vol. ii. pl. vi.

The above description was already prepared under the supposition that the specimen before me was distinct from *B. Belcheri*, when, through the kindness of Dr. Gwyn Jeffreys, I was enabled to compare it with the type of that species. It is less elongated, has a rather shorter spire; and the body-whorl is more ventricose. The columella also is less arcuate and more oblique, and the spiral ridges and lines of growth are more pronounced. The type does not display such regularity in the alternation of large and small transverse ridges as the variety. A specimen of this species from Finmark, in the collection of Mr. Jeffreys, very closely resembles the shell from Dobbin Bay.

Like the rest of the genus this species is subject to great variation. The type specimen is comparatively smooth and without plications beneath the suture; others are strongly plicated, and have the spiral ridging much raised.



*Buccinum Belcheri*.

*Buccinum sericatum*, Hancock,

Ann. & Mag. Nat. Hist. 1846, vol. xviii. p. 328, pl. v. f. 6.

*Hab.* Dobbin Bay, 30 fms. (*Hart*).

The radula of this species is remarkable for the unequal dentition of the side plates, one of which is a trifle the narrower

and is furnished with only two fangs: they are subequal in length; but the inner one is slightly the stouter. The other lateral plate has three teeth, of which the outermost is longest, the median smallest and at the base joins the inner fang. The median plate bears four small conical denticles.



Radula of  
*Buccinum sericatum*.

The only example of this species is a young shell. It agrees in all respects with Hancock's admirable description, except that the cilia of the epidermis are apparently closer together than in the type, in which they are said to be "not much crowded," whilst in the specimen before me there are about three in the space of a millimetre. The surface of the shell beneath the remarkable epidermis is very curiously wrinkly-striated. The operculum is roundish, greenish yellow on the inner side, and dirty yellow exteriorly; and the nucleus is rather less central than in *B. Belcheri*.

This species is considered a variety of *B. groenlandicum*, Chemnitz, by Jeffreys (see 'Annals & Mag. Nat. Hist.' April 1877, p. 323).

Taking into consideration the remarkable difference of the epidermis and of the radula, I think there can be no doubt of the specific distinctness of the two forms. Besides these differences there are others of form and sculpture.

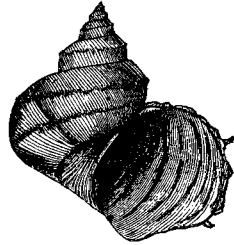
*Trichotropis tenuis*, sp. nov.

Shell very thin, light, semitransparent, glossy white, globosely turbinate, widely and openly umbilicated, clothed with a dirty-yellowish epidermis, produced on the keels of the whorls into close-set, very short, bristle-like filaments, and rather coarsely obliquely striated, or rather lamellated, marking periods of growth; whorls 6, the two apical ones smooth and rounded, the three following beautifully sculptured with raised oblique lines of growth and minute spiral striæ, keeled and angulated a trifle above the middle, convexly sloping above the keel and nearly straight beneath it; last whorl large, encircled with three faint keels, two near the middle and the third at the base, bordering the umbilicus; aperture subcircular, occupying about  $\frac{6}{11}$  of the entire length of the shell, whitish within, streaked with irregular, curved, yellowish-olive stripes; the peristome is continuous, thin, with the epidermis produced beyond its extreme edges; columella white, arcuate, with a slight shallow channel at its base.

Greatest length 33 millims., diam. of last whorl above the aperture 18, greatest diam. 30; aperture  $18\frac{1}{2}$  long, nearly 17 wide.

*Hab.* Off Cape Louis Napoleon, Grinnel Land, 79° 38' N. lat., in 25 fms.

Only a single specimen of this grand new *Trichotropis* was obtained. It is very different from any hitherto described, being remarkable for its circular aperture, conical spire, and extreme fragility. The entire surface under the epidermis is beautifully sculptured with oblique raised lines or spirulæ, and minutely striated in a spiral direction between them; and the raised keels are also similarly striated. The central keel of the last whorl is also visible on the upper ones, and is situated just above the suture.



*Trichotropis tenuis.*

Dr. Gwyn Jeffreys, who has seen the specimen, considers it a very abnormal form of *T. bicarinata*. Several other conchologists agree with me that it certainly is specifically distinct. The character of the epidermis is different, since it is not produced into such very long ciliations as in the old species. The keels are very slightly prominent; the space between them is convex, and not concave; and, finally, the growth of the shell appears to be quite regular, and does not display any appearance of distortion, such as is usually observable in abnormal growths of most species.

*Trichotropis borealis*, Broderip and Sowerby,

Zoological Journal, iv. 1829, p. 375; Sowerby, Thesaurus Conch. iii. p. 321, pl. 285. f. 1-3; Forbes and Hanley, Brit. Moll. pl. 101. f. 5-6; Jeffreys, Brit. Conch. vol. iv. pl. 4. f. 2, v. pl. 79. f. 6; Sow. Conch. Icon. xix. f. 1 a-c.

*Trichotropis costellatus*, Couthouy, Bost. Journ. Nat. Hist. vol. ii. 1839, pl. 3. f. 3; Sow. Thes. Conch. iii. pl. 285. f. 6; Conch. Icon. xix. f. 13.

*T. acuminata*, Jeffreys, Brown, Illust. Conch. ed. 2, pl. 57. f. 15.

*T. atlantica* (Beck), Möller, Naturhist. Tidsskrift, 1842, p. 85.

*Fusus umbilicatus*, Brown, Wernerian Memoirs, viii. pl. 1. f. 2.

*F. Laskeyi*, Macgillivray.

*Trichotropis inermis*, Hinds, Voy. Sulphur, pl. xi. f. 13-14; Sowerby, Thesaurus Conch. iii. pl. 285. f. 14; Conch. Icon. xix. f. 11.

*Hab.* Discovery Bay, 5 fms.; Dumb-bell Harbour (*Feilden*).

The specimens from the above localities agree precisely in shape and sculpture with that form of this species which was described by Hinds from shells found at Sitka, under the name of *T. inermis*. It is said to differ from *T. borealis* in the epidermis wanting the filamentous prolongations which usually obtain in this genus. In the British Museum there are several specimens of *T. borealis* which show various degrees in the



development of the epidermal filaments; and others, in bad condition, do not display evidences of their former presence. With regard to "strong ridges [on the body-whorl] at rather distant intervals, marking the termination or commencement of the periodical stages of growth" (*Hinds*), I should add that this character is frequently, indeed generally, present in typical specimens of *borealis*, and therefore I think that these two characters upon which *Hinds* establishes his species are not definitely specific. *T. cancellata*, *Hinds*, considered by *Jeffreys* to be synonymous with this species, appears to me sufficiently distinct.

I take this opportunity of correcting an error or two which occur in the monograph of this genus in the 'Conchologia Iconica.' Mr. *Sowerby* figures (pl. ii. fig. 6) a species under the name *flavidula*, *Hinds*, 'Voyage of the Sulphur.' The correct name of this species, which was described by *Hinds* in the 'Proceedings of the Zoological Society,' 1843, p. 18, and not in the 'Sulphur,' is *flavida*. The following species—*T. cedo-nulli*, *T. conica*, and *T. quadricarinata*—are quoted by *Sowerby* ('Conchologia Iconica') as existing in the British Museum. On comparing the monograph in that work with that in the 'Thesaurus,' it will be seen that the figures in the former, with the exception of *T. clathrata*, which is additional, are merely copies of those in the latter.

None of these three species are now in the Museum; but whether at the time of the preparation of the first monograph they were in the *Cumingian* collection I cannot say. If such were the case, I suppose they must have been lost *before* that collection was deposited in the Museum, or they certainly would now be with the other species of the genus. The fact of *Sowerby* (in the 'Conch. Icon.' August 1874) asserting their presence in the national collection is no guarantee of their existence there, because, besides his well-known inaccuracy, in this instance having merely copied his old monograph, he *presumes* that the shells exist in the Museum. *T. Kuzeri* in both works should be *T. Kröyeri*, *Philippi*.

*Velutina (Morvillia) zonata*, var. *grandis*.

*Velutina zonata*, *Gould*, Invert. Mass. ed. 1, p. 242, f. 160, ed. 2, p. 335, f. 606; *De Kay*, Moll. N. Y. pl. 23. f. 253; *Reeve*, Conch. Syst. pl. 147. f. 3, 4.

*Morvillia zonata*, *Gray*, Guide Moll. Brit. Mus. p. 45.

*Velutina (Morvillia) zonata*, *Mörch*, Arctic Manual, 1875, p. 126.

*Hab.* Franklin-Pierce Bay (*Hart*).

The only specimen was taken out of the stomach of *Phoca barbata*, and is in very bad condition. This variety is so very

much larger than the ordinary size of the species that it almost appears that it must be distinct. It measures 21 millims. in length, being about double that of Gould's figure. Hancock mentions one from the west coast of Davis Strait, which was about five eighths of an inch (or 16 millims.) long.

*Natica affinis*, Gmelin,

Syst. Nat. p. 3675; Mörch, Moll. Grönl. 1857, no. 56.

*Natica clausa*, Broderip and Sowerby, Zool. Journal, vol. iv. p. 373; Beechey's Voyage, pl. 34. f. 3; Reeve, Conch. Icon. ix. f. 113; Gould, Invertebrata Mass. f. 167, (ed. 2) f. 612.

*N. consolidata*, Couthouy, Bost. Journ. Nat. Hist. vol. ii. 1839, p. 89; Philippi, Conchylien, pl. I. f. 11.

*N. septentrionalis*, Beck, Möller, Naturhist. Tidsskr. 1842, p. 80.

*N. borealis* (Beck), Gould, l. c. p. 238, (ed. 2) p. 343.

Var. = *N. janthostoma*, Deshayes, Mag. de Zool. 1841, pl. 45; Reeve, Conch. Icon. ix. f. 79 *a, b*.

*Hab.* Dobbin Bay, 30 fms., bottom stones and mud (*H. C. Hart*, Aug. 1876).

Only a single small specimen was obtained, which is remarkable for having the spire rather more elevated than usual.

There is another species figured by Philippi, on plate i. figs. 2 and 3, under the name *affinis*, which is totally distinct from the present one.

In the description of this species Gould expressly remarks that it is "marked by striæ of growth *only*," and that the epidermis is "thin, bony." I presume that the last word should be *horny*; for there is nothing *bony* in the nature of the epidermis. As regards the sculpture, I find that all specimens I have examined distinctly show spiral striation, which, however, is very minute, and can only be seen by the aid of a lens. The animal is briefly described by Jeffreys in the 'Annals & Mag. Nat. Hist.' April 1877, p. 318. The variety (*N. janthostoma*) is usually rather more globular than normal specimens; and the umbilicus is frequently scarcely filled up by the callosity, as in arctic examples. *N. oclusa*, Searles Wood, a fossil from the Red Crag, an allied species, yet probably is distinct on account of its much more produced spire.

*Trochus (Margarita) umbilicalis*, Broderip and Sowerby,

Zoological Journal, 1829, iv. p. 371.

? *Trochus grönlandicus*, Chemnitz, Conch. Cab. v. pp. 12 & 108, f. 1671.

*Hab.* Franklin-Pierce Bay, 15 fms.; Mushroom Shore, 82° 29' N.

This species is also reported by Jeffreys, 'Annals & Mag. Nat. Hist. 1877, March, p. 237, from "Discovery Bay, and

fossil in Kane valley," from specimens collected by Captain Feilden during the expedition. These specimens were not sent to the Museum.

*Trochus (Margarita) glauca*, Möller,

Naturhist. Tidsskrift, 1842, p. 81.

*Margarita Harrisoni*, Hancock, Ann. & Mag. Nat. Hist. 1846, xviii. p. 325, pl. 5. figs. 4, 5.

*Hab.* With the preceding species at Franklin-Pierce Bay.

*Trochus (Margarita)*, sp., jun.

*Hab.* Cape Fiasco (*Feilden*).

This shell may be but a young specimen of *Margarita striata* of Broderip and Sowerby; but it differs from typical examples in the spire being comparatively small in proportion to the body-whorl, the base of which is almost destitute of revolving striæ; the umbilicus is larger and not bordered by a thickish ridge as is usually the case in this species.

*Chiton (Tonicia) marmoreus*, Fabricius,

Fauna Groenlandica, p. 420; Gould, Invert. Mass. ed. 2, 1870, pp. 261, 262, fig. 524.

*C. lævigatus*, Fleming, Reeve, Conch. Icon. iv. sp. 179.

*C. fulminatus*, Couthouy, Bost. Journ. Nat. Hist. ii. 1838, pl. 3. f. 19.

*Hab.* Franklin-Pierce Bay, 15 fms., temperature 29°-50 (*Hart* and *Feilden*).

*Lepeta cæca*, O. F. Müller.

*Patella cæca*, O. F. Müller, Zool. Dan. Prodr. p. 237; Middendorff, Reise Sibirien, p. 183, pl. xvi. f. 6.

*P. cerea*, Möller, Naturhist. Tidsskrift, 1842, p. 89; Reeve, Belcher's Voyage, p. 395, pl. 32. f. 1 a-c.

*P. candida*, Couthouy, Bost. Journ. Nat. Hist. ii. 1838, p. 86.

*Hab.* Franklin-Pierce Bay, 15 fms.; Cape Fraser, 30 fms.; and Richardson Bay, 70 fms. (*H. W. Feilden*).

The animal of this species (var. *concentrica*) has been briefly described by Middendorff, *l. c.* p. 186, and also by Dr. Jeffreys in the 'Ann. & Mag. Nat. Hist.' 1877, March, p. 231.

*Bulla (Cyllichna) alba*, Brown,

*Volvaria alba*, Brown, Illustrations Recent Conchol. ed. 2, pl. 19. f. 43, 44; Jeffreys, British Conch. iv. pl. 417, v. pl. 63. f. 6 (*Cyllichna alba*).

*Bulla corticata*, Beck, Möller, Naturhist. Tidsskrift, 1842, p. 79.

*B. triticea*, Couthouy, Bost. Journ. Nat. Hist. 1838, ii. p. 88, pl. 2. f. 8.

*Hab.* Discovery Bay, 5 fms. (*Feilden*).

*Bulla (Cylichna) striata*, Brown,

Illustr. Recent Conch. ed. 2, p. 57, pl. 19. f. 41, 42.

*B. scalpta*, Reeve, Belcher's Last Arctic Voy. vol. ii. p. 392, pl. 32.  
f. a-c.

*Hab.* Found with the preceding species.

*Onchidiopsis grønlandica*, Bergh,

Kongelige Danske Vidensk. Selsk. Skrifter, 1853, iii. p. 346, pl. ii.

*Hab.* Franklin-Pierce Bay, 13-15 fms., stony bottom  
(Hart).

It is interesting to find this curious species, which was described by Bergh from South-Greenland specimens, ranging so far north as the above locality.

*Eolis salmonacea*, Couthouy,

Boston Journ. Nat. Hist. 1838, ii. p. 68, pl. 1. fig. 2; Gould, Invert. Mass. ed. 2, pl. 18. f. 264, 265.

*Hab.* Discovery Bay (*Feilden*).

A single small specimen of this very pretty animal was found at the above spot. It is remarkable how easily the dorsal branchiæ fall off with the slightest touch.

## II. CONCHIFERA.

*Tellina (Macoma) tenera*, Leach.

*Macoma tenera*, Leach (not Say), Appendix Ross's Voy. 1819, p. 175.

*Tellina proxima* (Brown), Sowerby, Beechey's Voy. 1839, p. 154, pl.

44. f. 4; Hanley in Sowerby's Thesaurus, vol. i. p. 313, pl. 66. f. 264,  
pl. 59. f. 115; Philippi, Abbild. Conch. ii. pl. iii. f. 4.

*T. sordida*, Couthouy, Bost. Journ. Nat. Hist. 1838, vol. ii. p. 59, pl. iii.

f. 11 (nec Phil. l. c. f. 6 = *T. calcarea*, Chemn.).

? *T. crassula*, Desh. Proc. Zool. Soc. 1854, p. 354.

*Hab.* Discovery Bay, 5 fms. (*Feilden*).

Only an old worn shell obtained.

*Lyonsia arenosa*, Möller.

*Pandorina arenosa*, Möller, Naturhist. Tidsskrift, 1842, p. 93.

*Lyonsia gibbosa*, Hancock, Ann. & Mag. Nat. Hist. 1846, xviii. p. 338,  
pl. v. f. 11, 12.

*Anatina striata*, Gray, quoted by Gould, Invert. Mass. ed. 2, 1870,  
p. 6.

*Hab.* Discovery Bay, 5 fms. (*Feilden*).

Mr. Hancock quotes as a synonym of this species *Anatina striata*, Gray, as described in the appendix to Ross's Voyage. The shell collected by Ross, in the British Museum, obtained

“in a mass of ice,” has a second name attached to the tablet on which it is placed—*Lyonsia arctica*, Gray. Neither of these names were ever published.

The form described by Hancock appears to differ slightly from *L. arenosa* of Möller; for the umbones are situated more centrally, and consequently the anterior side is longer, as is seen in Hancock's figure. In Beechey's ‘Voyage,’ on plate 43 (fig. 3), a shell is figured, which possibly is the identical one collected by Ross; for it is exactly the same size, although the colour is different.

*Cardium islandicum*, Linn.,

Chemnitz, Conch. Cab. vi. pl. 19. f. 195; Gould, Invert. Mass. f. 58, (ed. 2) f. 450.

*C. ciliatum*, Fabricius, Fauna Grœn. p. 410.

*C. pubescens*, Couthouy, Bost. Journ. Nat. Hist. 1838, ii. pl. 3. f. 6.

*C. arcticum*, Sowerby, Conchol. Illustr. f. 26.

*C. islandicum* (Chemn.), Reeve, Conch. Ic. ii. f. 54.

*Hab.* Dobbin Bay, 30 fms. (*Hart*).

*Axinus Gouldii*?, Philippi,

Zeitschrift f. Malacozool. 1845, p. 74.

*Lucina flexuosa*, Gould, Invert. Mass. (ed. 1), p. 71, f. 52.

*Cryptodon Gouldii*, Invert. Mass. ed. 1870, p. 100, f. 406.

*Hab.* Discovery Bay, 5½ fms. (*Feilden*).

The shells associated with this species differ somewhat from the description given by Gould in having, besides “the widened groove,” a lanceolate depression or posterior lunule which extends from the umbones down the dorsal slope. It is also very similar to *A. croulinensis*, Jeffreys.

*Nucula inflata*, Hancock,

Ann. & Mag. Nat. Hist. 1846, xviii. p. 333, pl. v. f. 13, 14; Sowerby's Thesaurus, iii. pl. 229. f. 115, 116.

*Hab.* Discovery Bay, 5½ fms. (*Feilden*).

*Leda pernula*, Müller,

Hanley in Sowerby's Thes. Conch. iii. pl. 228. f. 56–58.

“*Arca Martini*,” Bolten; *Leda macilenta*, Steenstrup and Möller; *Nucula rostrata*, Mart., Lam.; *Nucula fluviatilis*, Sowb.” Mörch, Mol. Grœnland. p. 21.

*Nuculana pernula*, Mörch, l. c.

*N. elongata*, Daudin, teste Hanley.

*Hab.* Discovery Bay, 5½ fms. (*Feilden*).

*Leda minuta*, var., Fabricius,

Thesaurus Conch. iii. pl. 228. f. 61, 62.

*Nucula parva*, Sow. Conch. III. f. 7; *L. complanata*, Möller.

*Hab.* Richardson Bay, 80° 2' N. lat., 70 fms. (*Feilden*).

The specimens from the above locality have the transverse costæ rather finer than is usual.

*Leda glacialis*, Leach.

*Arca glacialis*, Wood, Index Test. Suppl. p. 6, pl. 2. f. 6.

*Nucula truncata*, Brown, Illust. Conch. ed. 2, p. 84, pl. 33. f. 13.

*N. portlandica*, Hitchcock, Reeve, Belcher's Last Arctic Voyage, vol. ii. p. 396, pl. 33. f. 3 a-b.

*Leda siliqua*, Reeve, A. Adams, Proc. Zool. Soc. 1856, p. 48; Reeve, Belcher's Voy. pl. 33. f. 4.

*Nucula (Portlandia) arctica*, Mörch (non *N. arctica*, Gray), Arctic Manual, 1875, p. 132.

*Leda (Nucula) arctica*, Jeffreys, Brit. Conch. ii. p. 158.

*Hab.* Discovery Bay, 5 fms. (*Feilden*).

In a young example of this species the posterior beak is scarcely observable.

Both Dr. Mörch and Gwyn Jeffreys consider this species the *Nucula arctica* of Gray.

In Parry's 'Voyage,' 1821, Appendix, p. ccxli, Gray describes his species as "oval-elliptical, smooth, very slightly concentrically wrinkled; epidermis yellowish green, glossy." The form "oval-elliptical" and the smooth, glossy epidermis appear to me sufficient to show that the shell described by Gray is different from that which it is considered to be by Mörch and Jeffreys; and these characters are decidedly applicable to the shell which Hanley, in his excellent monograph in the 'Thesaurus Conchyliorum,' has referred to Gray's species.

Again, Gray writes, "shell behind slightly produced, gaping, edge entire." Both shells may be said to be slightly produced; but certainly only the *true arctica* (that is, as determined by Hanley) shows a slight gape; for in the other shell (*glacialis*) there is not the faintest trace of an opening at the produced or beaked end. Dr. Mörch, in the 'Arctic Manual,' p. 132, quotes *N. arctica*, Gray, Parry's 'Voyage,' and Wood's Index, Suppl. t. 6.

The last reference is evidently a mistake, and it should be pl. 2, *Arca*, fig. 6; and on referring to the text of the Supplement, p. 6, the name referring to the figure is *glacialis*.

*Astarte semisulcata*, Leach.

*Crassina semisulcata*, Leach, Append. Ross's Voy. p. 175; Sowerby, Thesaurus Conch. ii. pl. 167. f. 21, 22 (as *A. lactea*); not *A. semisulcata*, Philippi, Abbild. ii. pl. i. f. 10.

*Astarte lactea*, Brod. & Sow. Zool. Journ. iv. p. 365; Beechey's Voyage, pl. 44. f. 12; Sow. Thesaurus, pl. 167. f. 23; Reeve's Conch. Icon. xix. f. 18.

*Crassina corrugata*?, Brown, Recent Conchol. ed. 2, p. 96, pl. 40. f. 24. *A. Richardsoni*, Reeve, Belcher's Voy. vol. ii. p. 397, pl. 33. f. 7.

*Hab.* Dumb-bell Harbour (*Feilden*); Discovery Bay, 5 fms. (*Feilden* and *Hart*).

The blackness of the epidermis in *A. lactea* is due, I think, to the specimens having been collected when dead; for all the shells with this kind of dark epidermis are old and worn, and evidently have been untenanted by the living animal for some time.

### *Astarte striata*, Leach.

*Nicania striata*, Leach (non Brown), Ross's Voyage, Appendix, p. 176; Thomson's Annals of Philosophy, xiv. p. 204.

*Astarte Banksii*, Gray (non Leach), Beechey's Voy. p. 152, pl. 44. f. 10 (fig. 9 is the true *C. Banksii*); Sowerby's Thesaurus, ii. p. 781, pl. 167. f. 8; Conch. Icon. xix. sp. 7; Mörch, Arctic Manual, p. 132. Var.—*A. globosa*, Möller, Naturhist. Tidsskrift, 1842, p. 93; Reeve, Belcher's Voy. pl. 33. f. 6 a, b.

*Hab.* Franklin-Pierce Bay, 15 fms. (*Feilden* and *Hart*).

The shell figured and described by Gould (Invert. Mass. ed. 2, 1870, p. 125, f. 438) under the name of *A. Banksii* of Leach, is not the species characterized by that author. I should suppose that Gould did not consult Leach's description in the appendix to Ross's 'Voyage,' as he does not quote the page, but probably followed Sowerby in the determination of the species ('Thesaurus Conch.' ii. p. 781, pl. 167. f. 8), who probably was misled in the identification of this shell by the figures in the Appendix to Beechey's 'Voyage.' In this work figure 10 on plate 44 is referred to in the text, p. 152, under the name of "*Astarte Banksii*?, Gray, in Brit. Mus.," and figure 9 on the same plate is said to represent "*Astarte striata*?, Gray, in Brit. Mus."

The description of *Banksii* given by Leach runs thus, "glabriuscula polita, sub umbonibus impresso-excavata;" and that of *striata* as follows, "concentrice striata, sub umbonibus cordato-impressa."

Of these two species there are specimens in the British Museum received from Captain Ross, which, in all probability, are the actual types described by Leach, and which at once show that the figures of the two species in Beechey's 'Voyage' are reversed—fig. 9, in fact, representing the true *Banksii*, and fig. 10 the true *striata*. The former is a smooth, glossy shell ("glabriuscula polita"), and only marked with very fine concentric striations or lines of growth, which do not at all

approach to riblets or fine costations, as in most other species of this genus; in fact the surface is not more striated than in the American *A. quadrans* of Gould; and the epidermis is yellowish olive.

On the contrary, *A. striata* has a dull surface and is distinctly but finely ribbed, and the epidermis darker and of a brownish olive colour. It may be but a variety of the *A. compressa* of Montagu, as suggested by Jeffreys ('Brit. Conch.' ii. p. 316); but besides the usually finer ribbing, the form is generally more elongate transversely and less triangular. Another closely allied species is *A. fabula* of Reeve, from which it differs in being differently sculptured. The transverse ribbing in Reeve's shell is very peculiar towards the umbones, and quite coarse in comparison with that on the other portion of the surface.

Another distinctive character is the length of the anterior muscular scar. I have examined a good series of both species; and I find that in *A. fabula* it is constantly longer than in *striata*, of course in shells of similar size. This is well shown in Reeve's figures (in Belcher's 'Voyage') of the two species. I think it very probable, judging from the description and figure, that Gould's *A. Banksii* is the *A. fabula*, Reeve.

*Astarte fabula*, Reeve,

Belcher's Last Arctic Voy. 1855, vol. ii. p. 398, pl. 33. f. 5 a, b.

*A. Banksii*, Gould (non Leach), Invert. Mass. ed. 2, 1870, p. 125, fig. 488, probably.

*Hab.* Dumb-bell Harbour and Discovery Bay (*Feilden*).

This species may be recognized by the peculiar ribbing near the umbones. In this region the ribs are more strongly developed than on the rest of the surface of the valve, and are not produced quite to the margins, so that in looking at the shell with the umbones towards the eye the dorsal areas appear comparatively smooth.

? *Astarte Warehami*, Hancock,

Ann. & Mag. Nat. Hist. 1846, xviii. p. 336, pl. 5. f. 15, 16.

*Hab.* Franklin-Pierce Bay, 13-15 fms., bottom stony (*H. C. Hart*); Richardson Bay, 80° 2' N. lat., 70 fms. (*H. W. Feilden*).

I do not feel quite sure of the accuracy of the identification of the specimens before me. They differ slightly in form from Hancock's figure, being less elliptical by reason of the anterior end being less produced; but with regard to the ribs and epidermis they agree exactly with the author's excellent descrip-



tion—the former being “fine, close, regular,” and the latter pale greenish yellow. These shells, in shape, can certainly be matched with some specimens of *A. striata*, and do not appear to vary in any thing except the difference of colour of the epidermis, which in the latter species is brown or olive-brown. This species is considered the same as *A. fabula* by Jeffreys.

*Mya truncata*, Linn.,

Forbes and Hanley, Brit. Moll. pl. x. f. 1–3; Jeffreys, Brit. Conch. iii. pl. 3. f. 1, vol. v. pl. 50. f. 2; Gould, Invert. Mass. ed. 2, f. 376; for list of other figures see Gray's Cat. Brit. Moll. 1851, p. 68.

Var. *pelagica*, King, Ann. & Mag. Nat. Hist. 1846, xviii. p. 242.

Junior = *M. ovalis*, Turton, Brit. Biv. pl. 3. f. 1, 2.

= *Sphæmia Swainsonii*, Turton, Brit. Biv. pl. 19. f. 2.

Var. = *Mya uddevalensis*, Forbes, Hancock, Ann. & Mag. Nat. Hist. 1846, xviii. p. 337.

*M. præcisæ*, Gould, Proc. Bost. Soc. Nat. Hist. 1850, vol. iii. p. 215; Atlas, Wilkes Explor. Exped. pl. 33. f. 498 *a, b*.

*Hab.* Discovery Bay, 5 and 25 fms. (*Hart* and *Feilden*); Dobbin Bay, 30 fms. (*Hart*).

All the specimens from these localities have the posterior marginal slopes directed inwards or towards the base of the shell, which peculiarity is characteristic of the variety *uddevalensis*. One shell is remarkable on account of the abruptness of the truncation and its narrowness, the width being only 6 millims. more than the length (30 millims.).

*Saxicava arctica*, Linn.

For the synonyma of this species see Brit. Mus. Cat. Brit. Anim. part vii. pp. 86–89.

*Hab.* Discovery Bay, 5 fms. (*Feilden*); Franklin-Pierce Bay (*Hart* and *Feilden*); Dobbin Bay, 30 fms. (*Hart*).

Some specimens from Franklin-Pierce Bay are remarkable on account of their great solidity, the depth and distinctness of the muscular scars, and the purplish brown colour which stains both the inside and exterior of the valves.

Mr. Hart found dead examples at Cape Frazer at an elevation of 10 feet above sea-level.

*Modiolaria lævigata*, Gray.

*Modiola lævigata*, Gray, Appendix Parry's Voy. 1821, p. 245; Reeve, Conch. Icon. x. sp. 53, f. 66.

*Mytilus lævigatus*, Wood, Index Test. Suppl. pl. 2. f. 5.

*Modiolaria discors*, Gould (non Linn.), Invert. Mass. ed. 2, 1870, p. 192, fig. 489 (var. *lævigata*).

*Hab.* Franklin-Pierce Bay, 15 fms. (*Feilden* and *Hart*).  
*Ann. & Mag. N. Hist. Ser. 4. Vol. xx. 10*

This species is considered by some authors a variety of the British *M. discors*. There are, however, certain differences in form, colour, and sculpture which appear to me sufficient to distinguish the two species. The present is a larger species, transversely more elongate and proportionally narrower, the difference in width of the anterior and posterior ends being less marked. The striæ on the hinder area, in adult specimens, are distinct only towards the umbones, and gradually become obsolete towards the margin of the valves, which, on this account, are smooth and not denticulated within as in *discors*. The epidermis of *laevigata* is brown on the greater portion of the shell, becoming pale olive or brownish green towards the umbones.

The figures in Gould's Invert. Mass. 1870, are evidently reversed; fig. 490, on page 193, represents his idea of *discors*, and not the variety *laevigata*, which is figured on the previous page. Whether the American shell is the same as the British species is somewhat doubtful; but, judging from Gould's figure and specimens in the British Museum, they appear to be different, the form being certainly distinct.

*Pecten (Pseudamusium) grænlandicus*, Sowerby,

Thesaurus Conch. i. pl. xiii. f. 40.

*P. vitreus*, Gray (non Chemnitz), Parry's Voy. 1819, appendix, p. 245.

*Hab.* Off Cape Louis Napoleon, 25 fms.; Hayes Point, 35 fms. (*Feilden*); Discovery Bay, 5½ fms. (*Feilden* and *Hart*).

## PROCEEDINGS OF LEARNED SOCIETIES.

### ROYAL SOCIETY.

Jan. 25, 1877.—Dr. J. Dalton Hooker, C.B., President, in the Chair.

Description of the Living and Extinct Races of Gigantic Land-Tortoises.—Parts III. & IV. The Races of the Aldabra Group and Mascarene Islands. (Conclusion.) By Dr. ALBERT GÜNTHER, F.R.S.

In continuation of, and concluding, the researches into the history of the Gigantic Land-Tortoises, read before the Royal Society on June 20, 1874, and published in the 165th volume of the Philosophical Transactions, the author treats in Parts III. and IV. of the Tortoises of the Aldabra Group and Mascarenes.