

appearance, only that they are nearly colourless; at the lower end of each is an irregularly shaped nucleus. The lower end of the rhabdom projects into their substance; the large size and transparency of these cells seems to indicate that they serve as dioptric media.

2. On the Mollusca procured during the 'Lightning' and 'Porcupine' Expeditions, 1868-70. (Part VIII.¹) By J. GWYN JEFFREYS, LL.D., F.R.S., F.Z.S.

[Received April 30, 1884.]

(Plates XXVI.-XXVIII.)

GASTROPODA (*continued*).

Family XVI. ACLIDÆ.

Apex having a dextrorsal and involute spire.

CIONISCUS², Jeffreys.

SHELL cylindrical, striated or fluted lengthwise, and sometimes reticulated: *spire* elongated; apex blunt and twisted: *mouth* oval, contracted.

Differs from *Aclis* in the sculpture, apex, and shape of the mouth.

In 'British Conchology' (vol. iv. p. 102) I proposed the generic name *Graphis* for the only species which was then known, viz. *Turbo unicus* of Montagu, which may be considered the type of the present genus; but I afterwards (vol. v. p. 210) substituted *Cioniscus* for *Graphis*, finding that the latter name had been long previously used by botanists for a genus of Lichens. Out of the four species now known, one of them (*C. unicus*) inhabits the littoral and laminarian zones, all the other species being deep-water or abyssal.

✓ 1. CIONISCUS GRACILIS³, Jeffreys. (Plate XXVI. fig. 1.)

SHELL of nearly equal breadth throughout, thick, semitransparent, and glossy: *sculpture*, numerous sharp and flexuous longitudinal ribs, which extend to the base; there are about 25 on the last whorl; each whorl is angulated or shouldered at the top; the first whorl and a half, which form the apex, are marked by two slight spiral striæ, but are otherwise smooth and polished: *colour* whitish, with a faint tinge of yellowish-brown: *spire* very gradually tapering to a blunt and apparently truncated point; apex somewhat inflected: *whorls* $5\frac{1}{2}$, convex, but rather compressed: *suture* deep: *mouth* somewhat

¹ For Part I. see P. Z. S. 1878, p. 393; for Part II. see P. Z. S. 1879, p. 553; for Part III. see P. Z. S. 1881, p. 693; for Part IV. see P. Z. S. 1881, p. 922; for Part V. see P. Z. S. 1882, p. 656; for Part VI. see P. Z. S. 1883, p. 87; and for Part VII. see P. Z. S. 1884, p. 111.

² Resembling a little pillar; from *κίων*, columna, and *ἴσχω*, assimulo.

³ Slender.

more round than oval; peristome continuous or complete: *outer lip* flexuous, usually strengthened by a rib, contracted above: *inner lip* attached to the pillar, which is oblique; there is no umbilicus. L. 0.1. B. 0.025.

'Porcupine' Exp. 1870: Atl. St. 17a, 26-30, 33; Med. 55.

Distribution. Bay of Biscay ('Travailleur' Exp.), Tunisian coast (*Nares* and *Dautzenberg*), S. Vito (*Monterosato*), off the west coast of Africa and the Azores ('Talisman' Exp.); 108-1622 fms.

Fossil. Pliocene: Messina (*Seguenza*).

✓ 2. *CIONISCUS STRIATUS*¹, Jeffreys. (Plate XXVI. fig. 2.)

SHELL forming an elongated column, thin, semitransparent, and glossy: *sculpture*, close-set, thread-like, and flexuous longitudinal ribs, about twice as many as in the last species; they do not extend to the base of the shell; one at least of these ribs is varicose or larger and thicker than the rest; there are slight indications of spiral striæ under the microscope; the two apical whorls are quite smooth or polished: *colour* whitish: *spire* elegantly and gradually tapering to a blunt and bulbous point: *whorls* 8, convex and rounded: *suture* deep and well defined: *mouth* roundish-oval; lips disunited: *outer lip* contracted at the upper corner: *inner lip* adhering to the pillar and resembling a thin glaze: *umbilicus* none, but the base is somewhat depressed. L. 0.15. B. 0.05.

'Porcupine' Exp. 1870: Atl. St. 16. Four more or less perfect specimens.

Distribution. Tunisian coast (*Nares*), off the Sahara and west coast of Africa ('Talisman' Exp.); 300-1261 fms.

In the last 'Talisman' Expedition occurred another species of *Cioniscus*, which will be named and described by Dr. Fischer or the Marquis de Folin. It is larger than either of the species now described; the ribs are straight, and do not extend below the periphery; and the mouth is longer.

✓ 1. *ACLIS ASCARIS*, Turton.

Turbo ascaris, Turt. Conch. Dict. p. 217.

A. ascaris, B. C. iv. p. 102; v. p. 210, pl. lxxii. fig. 2.

'Porcupine' Exp. 1869: St. 2, 18. 1870: Med. Adventure Bank.

Distribution. W. & S. Norway to Crete; 15-120 fms. Occurs with *A. supranitida*, but both species have been apparently confounded in local catalogues. The present species is much smaller and narrower; and it has no umbilicus. *A. supranitida* is larger, and more conical or wider at the base; and the umbilicus is very conspicuous in every state of growth. A specimen of *A. ascaris*, which was found by the late Mr. Robert Dawson in shell-sand from St. Magnus Bay, Shetland, has a variciform rib.

Fossil. Pliocene: Coralline Crag, Pisa (*Manzoni*), Tuscany (*De Stefani*).

There are some doubtful and obsolete synonyms of v. Muhlfield and others.

¹ Fluted.

✓ 2. *ACLIS SUPRANITIDA*, S. Wood.

Alvania supranitida, S. Wood, Cat. Crag. Moll. 1842.

Aclis supranitida, B. C. iv. p. 103, pl. ii. fig. 4.

'Porcupine' Exp. 1869: St. 18, Donegal Bay (fine and living specimens), N. Channel. 1870: Atl. Vigo Bay; Med. 30, 55, Adventure Bank.

Distribution. W. Norway to the Mediterranean and Adriatic, Madeira and Canaries (*McAndrew*); 8-108 fms.

Fossil. Pliocene: Coralline Crag and Italy. Post-tertiary: Norway (*Crosskey* and *Robertson*), Belfast (*Stewart*).

The synonyms are referable not only to *Aclis*, but also to *Turritella*, *Alvania*, and *Pyramis*, with various specific names; for these see 'British Conchology.'

The following is an extract from my note-book as to the Donegal Bay specimens:—"BODY clear white, with a pink streak down the middle: *mantle* rather thin: *snout* or *mentum* bilobed in front: *tentacles* triangular (being a modification of those in *Odostomia*), with blunt tips: *eyes* 2, black, small, sessile on the head at the inner base of the tentacles: *foot* elongated, squarish in front and pointed behind: *operculum* thin, striated in the line of growth; spire small, placed close to the inner or pillar lip."

Sculpture of the shell very variable, sometimes altogether wanting.

✓ 3. *ACLIS WALLERI*, Jeffreys.

A. walleri, B. C. iv. p. 105; v. p. 210, pl. lxxii. fig. 4.

'Porcupine' Exp. 1869: St. 15, 19, 36, 47. 1870: Atl. 3, 6, 9, 16, 17, 17a; Med. Adventure Bank.

Distribution. 'Vöringen' Arctic Expedition and Loffoden Isles to the Gulf of Egina, New England (*Verrill*), off C. Verd I. ('Talisman' Exp.); 10-1192 fms.

Fossil. Pliocene: Coralline Crag, Calabria, and Sicily.

Synonyms. *A. terebralis*, M. Sars, MS., var. *minor* as *A. exigua*, G. O. Sars, and *Odostomia nisoides*, Brugnone. Monterosato prefers to spell the specific name "*valleri*"; but it is evident that, although there is no letter W in the Latin language, it would not be right to alter the name in order to put it into a classical dress, and the identification of *valleri* with the name of the discoverer of the present species would be lost.

This pretty shell is very variable in size as well as in sculpture. Some specimens from the 'Porcupine' Expedition of 1870 show indistinct traces of spiral ridges on the last whorl and of longitudinal ribs on the upper whorls, while others have a slight keel on the periphery. But not one of these characters is constant. M. Bourguignat, indeed, says, in his second letter to Professor Brusina ('Lettres malacologiques,' Paris, 1882, pp. 36-38), "La nouvelle école distingue donc, sur un nom spécial, toute forme ayant des caractères constants, pourvu que ses caractères soient au nombre de trois. Au-dessous de ce nombre elle rejette les formes au rang de variété." The words italicized are similarly emphasized in the

original. Upwards of forty years ago the late Edward Forbes proposed to distinguish species in the same way. But it is notorious that the relative value and constancy of these characters have yet to be determined, and that there is no standard of reference by which naturalists can be guided in adjudging some forms to be species and others to be varieties in different genera. Every naturalist, whether of the old or the "new" school, must form his own opinion. I have already, in the first chapter of the introduction to my work on 'British Conchology' (pp. 18-19, 23), fully stated my views on this difficult and hitherto unsettled question.

In the present species the apical whorls are pinched up and narrower than the rest of the spire; the mouth in perfect specimens resembles that of *Pherusa gulsonæ*.

✓ 4. *ACLIS VENTROSA*, Jeffreys.

A. ventrosa (Jeffr.), Friele, Bidrag til Vestlandets Molluskfauna (Vid. Forh. 1875, separate copy), p. 5, t. i. f. 7, 7a, 7b.

'Porcupine' Exp. 1869: St. 23a. 1870: Atl. 16.

Distribution. Lofoten I. (G. O. Sars), Bergen (Friele); 200-300 fms.

More conical and broader at the base, and with the whorls more rapidly increasing, than *A. walleri*. It belongs to the genus *Hemiaclis* of G. O. Sars.

✓ *PHERUSA GULSONÆ*, Clark.

Chemnitzia gulsonæ, Clark in Ann. & Mag. Nat. Hist. 3rd ser. vi. p. 459.

Aclis gulsonæ, B. C. iv. p. 106; v. p. 210, pl. lxxii. f. 5.

'Porcupine' Exp. 1870: Atl. St. 27, 28. Fragments only.

Distribution. British and Irish coasts from Shetland to Guernsey, Vigo Bay (*McAndrew*), Palermo (*Monterosato*), Madeira (*Watson*); 20-103 fms.

Fossil. Pliocene; Coralline Crag, Sutton (*S. Wood*).

See 'British Conchology' for the description of the animal and shell, which shows the peculiar characters of this mollusk. I had there suggested the generic name *Menippe*; but as that name had been previously employed in the Crustacea, I venture to substitute *Pherusa*, which was at one time given to it by Mr. Clark, the discoverer of the shell. I cannot explain the meaning of this name.

Family XVII. PYRAMIDELLIDÆ.

Apex having a sinistrorsal and exposed spire.

It is unnecessary, if not a waste of time, to recapitulate the facts and arguments which I used in 'British Conchology' (vol. iv. pp. 108-111) for the purpose of proving that the subdivision of *Odotomia* into several genera is really unscientific, and is not based on a single valid character. The presence of a "tooth" or columellar fold, the length of the spire, and the kind of sculpture (if any) are so variable, that it is quite impossible to distinguish or separate certain

species which might else be treated as mere varieties of other species. I shall be pleased if my brother conchologists will take the trouble to read the observations which I have to make in the course of the following pages, and will consider the question impartially and without regard to preconceived notions. In corroboration of my opinion that the presence or absence of a "tooth" or columellar fold does not of itself constitute a generic character, I would refer to some judicious remarks by Dr. Fischer in the 'Journal de Conchyliologie' for 1865.

I may take this opportunity of noticing, par parenthèse, that Philippi, in his generally useful 'Handbuch' (1853), gave *Odotomia* of Fleming as a synonym of *Rissoa*!

A. Typical. Smooth or variously sculptured, and always dentated.

✓ 1. *ODOSTOMIA ELECTA*, Jeffreys.

O. electa, Proc. Zool. Soc. 1883, p. 394, pl. xlv. f. 3.

'Porcupine' Exp. 1869: St. 4. A single but perfect specimen.

Distribution. Between the Hebrides and Faroes ('Triton' cruise); 516 fms.

Allied to *Liostomia eburnea* of G. O. Sars; but, besides being very much smaller, the apex of the spire in the present species is abruptly and obliquely truncated, and the suture is not excavated as in the other species.

✓ 2. *ODOSTOMIA CLAVULA*, Lovén.

Turbonilla clavula, Lov. Ind. Moll. Scand. p. 18.

O. clavula. B. C. iv. p. 118; v. p. 211, pl. lxxiii. f. 1.

'Porcupine' Exp. 1869: St. 2, 18. 1870: Atl. Vigo B, 13.

Distribution. Lofoten I. to Smyrna; 6-163½ fms.

Fossil. Pliocene: Calabria and Sicily.

A variety appears to be *O. pistillus*, afterwards *pistilliformis* of Brugnone.

This species is always distinguishable by having the shape of a short cylinder with a truncated apex.

✓ 3. *ODOSTOMIA SUBOBLONGA*¹, Jeffreys. (Plate XXVI. fig. 3.)

SHELL conic-oblong, of moderate thickness, semitransparent, and glossy: *sculpture* none except a slight keel which encircles the periphery in young and half-grown specimens, and gives them a somewhat angular appearance: *colour* ivory-white: *spire* shortish; nucleus not prominent, and twisted inwards: *whorls* 4-5, slightly compressed but not flattened, gradually enlarging; the last equals two thirds of the spire when the shell is placed with the mouth upwards: *suture* shallow: *mouth* pear-shaped, somewhat contracted above and expanded below; its length is between one half and two fifths of the spire; inside smooth: *outer lip* rather thick-edged: *inner*

¹ Somewhat oblong.

lip spread on the pillar and continuous with the outer lip; there is no umbilicus or chink: *tooth* sunken, mostly observable in half-grown specimens. L. 0.1. B. 0.05.

'Porcupine' Exp. 1869: St. 4. 1870: Atl. 9, 13, 26-34; Med. 40, 55, Adventure Bank.

Distribution. Bay of Biscay ('Travailleur' Exp. 1880 & 1881), off the Tunisian coast (*Nares*), Messina (*Granata*), off C. Verd. I. ('Talisman' Exp.); 30-1192 fms.

By comparing the above description of this species with those of other species belonging to the present section which are given in the fourth volume of 'British Conchology,' the difference will be easily seen. Some conchologists, for whose opinion I have a great esteem, believe that I have too much restricted the number of species; but I have conscientiously endeavoured to preserve the "juste milieu" in that respect.

✓ 4. ODOSTOMIA UNIDENTATA, Montagu.

Turbo unidentatus, Mont. Test. Brit. (ii.) p. 324.

O. unidentata, B. C. iv. p. 134; v. p. 211, pl. lxxiv. f. 1.

'Lightning' Exp. St. 2, 4, 5 (var. *elata*).

'Porcupine' Exp. 1869: St. 2. 1870: Atl. 3a, 9, off C. Sagres, Tangier B.; Med. Benzert Road.

Distribution. Iceland, Hammerfest and Vadsö to the eastern coasts of the Mediterranean, western coasts of Africa ('Talisman' Exp.), Canaries and Madeira, Pernambuco ('Challenger' Exp.); 10-777 fms.

Fossil. Pliocene: Red Crag, Calabria; Post-tertiary: Norway, Scotland, and Ireland; 8-460 ft. Not *O. unidentata* of Philippi from the Tertiaries of N.W. Germany.

Besides the synonyms given in 'British Conchology,' I would observe that *O. monterosatoi* of the learned authors of the marine mollusca of Roussillon appears to be the young of the present species, judging from typical specimens kindly submitted by M. Dautzenberg to my examination.

✓ 5. ODOSTOMIA TURRITA, Hanley.

O. turrita, Hanl. in Proc. Z. S. pt. xii. p. 18: B. C. iv. p. 135, v. p. 211, pl. lxxiv. f. 2.

'Lightning' Exp. St. 4, 5.

'Porcupine' Exp. 1870: Med. 55, Adventure Bank (var. *nana*).

Distribution. Vadsö and Lofoten I. to Hydra Channel in the Gulf of Egina and the Adriatic, Madeira and Teneriffe (var. *nana*), Pernambuco ('Challenger' Exp.); 0-350 fms.

Fossil. Post-tertiary: Norway and Lochgilp (*Crosskey* and *Robertson*); 3-240 ft.

O. turriculata of Monterosato seems to be another variety of this species.

Mr. Pidgeon observed this species at Torquay feeding on the polyparies of a *Lepralia*.

✓ 6. *ODOSTOMIA ACUTA*, Jeffreys.

O. acuta, Jeffr. in Ann. & Mag. N. H. 2nd ser. ii. p. 338: B. C. iv. p. 130; v. p. 211, pl. lxxiii. f. 8.

'Porcupine' Exp. 1870: Med. St. 50, Benzert Road, Adventure Bank (dwarf variety).

Distribution. Lofoten I. to E. Mediterranean and the Adriatic, Canaries and Teneriffe; 0-120 fms.

Fossil. Pliocene: Coralline and Red Crag, and Sicily. Post-tertiary: Belfast and Selsea.

Clark was right in saying that the throat was grooved in some specimens. I have one of this kind which was dredged by Mr. Verkrüzen at Falmouth. Mr. Pidgeon remarks in his letter to me of the 9th November, 1874, that this species is "most abundant at Torquay, under stones at low water, spring-tides, but never unless associated with tubes of *Serpula*. To-day I found one stone which was crowded with them, nestling among the tubes; neighbouring stones could not show a specimen, if they were free from *Serpulæ*."

✓ 7. *ODOSTOMIA CONOÏDEA*, Brocchi.

Turbo conoideus, Br. Conch. Foss. Subap. ii. p. 659, t. xvi. f. 2.

O. conoïdea, B. C. iv. p. 127; v. p. 211, pl. lxxiii. f. 6.

'Porcupine' Exp. 1869: St. 2, 13, 18. 1870: Atl. 6, 10, Vigo B., Setubal B., C. Sagres, 30; Med. off Jijeli, Benzert Road, Rasel Amoush, G. Tunis, Adventure Bank. Nearly all the specimens belong to the variety *australis*, a few to an intermediate form.

Distribution. Hammerfest to the Archipelago and Adriatic; ? Red Sea (*Philippi*); 0-130 fms.

Fossil. Miocene, Pliocene, and Post-tertiary: throughout Europe and Rhodes.

The synonyms are numerous. I have noted eleven, including *Rissoa polita* of Scacchi, *Odontostoma sicula* of Philippi, *Eulima monodon* of Requier, *Odostomia nagli* and *O. sismondæ* of Seguenza.

My friend the Marquis de Folin found a monstrous specimen on the northern coast of Spain which has a complete peristome.

✓ 8. *ODOSTOMIA TENUIS*¹, Jeffreys. (Plate XXVI. fig. 4.)

SHELL oblong, slender, rather thin, nearly transparent, and glossy: *sculpture* none except exceedingly fine and close-set lines of growth, which are observable only under a microscope: *colour* whitish: *spire* elongated; apex or nucleus rather prominent: *whorls* 6, somewhat compressed, gradually enlarging; the last equals three fifths of the spire with the mouth placed upwards; *suture* rather shallow: *mouth* oval, slightly contracted above, curved below; its length does not much exceed one third of the shell; the inside is marked with half a dozen short grooves or striæ in the direction of the spire, which are distinctly seen through the shell: *outer lip* sharp: *inner lip* folded back on the pillar and continuous with the

¹ Slender or slim.

outer lip; there is no umbilicus or chink: *tooth* small but conspicuous. L. 0.1. B. 0.05.

'Porcupine' Exp. 1870: Med. St. 55, Adventure Bank.

Distribution. Brittany (*Cailliaud*), G. Tunis (*Nares*); 50–100 fms.

Differs from *O. conoïdea* in being very much smaller, as well as slender and narrow, instead of conical and angulated. The labial grooves are fewer in number and confined to the front; in *O. conoïdea* these are more numerous and prolonged. And the present species has no umbilicus or chink.

✓ 9. *ODOSTOMIA ALBELLA*, Lovén.

Turbonilla albella, Lov. Ind. Moll. Scand. p. 19.

O. albella, B. C. iv. 121; v. p. 211, pl. lxxiii. f. 1.

'Porcupine' Exp. 1870: Atl. St. Tangier B., Gibraltar.

Distribution. Hammerfest to Algiers, Sicily, and the Adriatic, Madeira (*Watson*); 0–40 fms.

Fossil. Post-tertiary: Norway, Sweden, and Caithness; 40–100 ft.

✓ 10. *ODOSTOMIA RISSOÏDES*, Hanley.

O. rissoïdes, Hanley, in P. Z. S. pt. xii. p. 18: B. C. iv. p. 122;

v. p. 211, pl. lxxiii. f. 4.

'Lightning' Exp. St. 5.

'Porcupine' Exp. 1870: Atl. 13, 30 (var. *exilis*).

Distribution. Christiania, Bohuslän, Baltic, Danish coasts, North Sea, Great Britain and Ireland, N. and W. France and Spain, Mediterranean and Adriatic, off the West of Africa ('Talisman' Exp. 1883), Madeira (*Watson*); 0–777 fms. The variety *dubia* was dredged in the 'Challenger' Expedition off Prince Edward Island in 50–150 fms.

Fossil. Pliocene: Calabria and Sicily.

This common and variable species is apparently *Rissoa glabra* of Brown, *O. scalaris* of Macgillivray (a name, however, preoccupied by Philippi), *Turbonella transparens* of Leach; and I consider the variety *dubia* to be *O. edwardi* of Watson. *Helix resupinata* of Montagu from Walker's figure 24 was probably the fry of the present species.

✓ 11. *ODOSTOMIA PALLIDA*, Montagu.

Turbo pallidus, Mont. Test. Br. (ii.) p. 325, t. 21. f. 4.

O. pallida, B. C. iv. p. 124; v. p. 211, pl. lxxiii. f. 5.

'Porcupine' Exp. 1870: Atl. St. Vigo B., Tangier B.

Distribution. Bodö in arctic Norway to the Gulf of Egina and the Adriatic; 2–250 fms.

Fossil. Pliocene: Pisa, Calabria, and Sicily. Post-tertiary: Belfast, Clyde Beds, and Sicily.

For the rather numerous synonyms see 'British Conchology,' and add *O. novegradensis* of Brusina.

The peculiar habitat of this species is the "ears" of *Pecten opercularis* and *P. maximus*. There are several varieties.

✓ 12. *ODOSTOMIA NITENS*, Jeffreys. (Plate XXVI. fig. 5.)

O. nitens, Jeffr. in Ann. & Mag. N. H. July 1870, p. 79.

'Porcupine' Exp. 1869: St. 15. 1870: Atl. 3, 8, 9, 27, 28; Med. Adventure Bank.

Distribution. Palermo (*Monterosato*), Ægean (*Spratt*), Adriatic (*Brusina*), Fayal ('Challenger' Exp.); 130-450 fms.

Differs from *O. (Syrnola) minuta* of A. Adams, which is cylindrical, and has more whorls as well as a golden band encircling the periphery, and a strong tooth. In the present species the tooth is represented by a broad but not conspicuous fold on the pillar. The peristome is entire or continuous; operculum of a pale yellow colour. It varies greatly in size, from 0.15 to 0.075 in length, and proportionably in breadth.

O. erjaveciana of Professor Brusina.

✓ 13. *ODOSTOMIA DIAPHANA*, Jeffreys.

O. diaphana, Jeffr. in Ann. & Mag. N. H. 2nd ser. ii. p. 341: B. C. iv. p. 141; v. p. 212, pl. lxxiv. f. 5.

'Porcupine' Exp. 1870: Med. St. Adventure Bank. A small and slender variety.

Distribution. Bergen to the eastern coasts of the Mediterranean and the Adriatic; 12-80 fms.

Fossil. Pliocene: Sicily.

✓ 14. *ODOSTOMIA INSCULPTA*, Montagu.

Turbo insculptus, Mont. Test. Br. Suppl. p. 129.

O. insculpta, B. C. iv. p. 139; v. p. 211, pl. lxxiv. f. 4.

'Lightning' Exp. St. 4, 5.

'Porcupine' Exp. 1870: Atl. Vigo B., 26.

Distribution. Iceland and Lofoten I. to the Bay of Biscay; 10-586 fms.

Fossil. Pliocene: Coralline Crag, Ficarazzi (*Brugnone*). Post-tertiary: Norway (*Croskey* and *Robertson*); 0-100 ft.

Turbonilla obliqua, Lovén (ex spec. Örsted).

✓ 15. *ODOSTOMIA PLICATA*, Montagu.

Turbo plicatus, Mont. Test. Brit. (ii.) p. 325, t. 21, f. 2.

O. plicata, B. C. iv. p. 137; v. p. 211, pl. lxxiv. f. 3.

'Porcupine' Exp. 1870: Med. St. Adventure Bank (semi-fossilized).

Distribution. Bergen (*Friele*) to Sicily and the Adriatic, Madeira (*McAndrew*): 0-120 fms.

Fossil. Pliocene: Coralline and Red Crag, Biot, and Italy. Post-tertiary: Selsea. Not *Odontostoma plicatum* of Hörnes, a Miocene fossil.

Eulima bulimus of Scacchi, *Rissoa elongata* of Philippi, *O. fusulus* of Monterosato, and other synonyms. Not *O. vitrea* of Brusina, as

stated in 'British Conchology ;' that is *O. neglecta* of Tiberi, and I was misled by observing in the collection of the late M. Petit, at Paris, specimens of the present species under the name of *O. vitrea*.

✓ 16. *ODOSTOMIA PRÆLONGA*¹, Jeffreys. (Plate XXVI. fig. 6.)

SHELL obelisk-shaped, thin, semitransparent, and very glossy : *sculpture* none : *colour* clear white : *spire* long and elegantly tapering ; apex or nucleus rather blunt : *whorls* 10, more or less compressed : *suture* slight, usually rather oblique : *mouth* squarish-oval, somewhat inflected above and curved below : *outer lip* thin and flexuous, smooth within : *inner lip* so filmy as to be scarcely perceptible : *umbilicus* none : *tooth* small but distinct. L. 0·275. B. 0·075.

'Porcupine' Exp. 1870: Atl. St. 13, 17a, 24, 27-30, 32-34, 36 ; Med. 50, 55, Adventure Bank. Many specimens of various sizes ; those from the Mediterranean are much smaller and more slender.

From the Adventure Bank Station I have an imperfect specimen and some fragments of apparently another species allied to the present. It has a thick shell with an angular periphery and a straight pillar, a slighter and straighter suture, and a smaller tooth. If more specimens should be found this may be named *concinna*.

Distribution. Bay of Biscay ('Travailleur' Exp. 1880 and 1881), Coralline zone, Sciaccha (*Monterosato*), Algiers (*Joly*), E. Mediterranean (*Nares*), off West coast of Africa ('Talisman' Exp. 1883) ; 20-733 fms.

I noticed this species in the Reports of the British Association for 1873, p. 112. If it were not for the conspicuous tooth, it would certainly be placed in the so-called genus *Eulimella*.

✓ 17. *ODOSTOMIA CRASSA*², Jeffreys. (Plate XXVI. fig. 7.)

SHELL cylindrical, remarkably thick and strong, opaque, and glossy : *sculpture* none, except microscopic lines of growth and the grooves with the outer lip hereafter mentioned, as well as the periphery being slightly angulated : *colour* ivory-white : *spire* long and finely tapering : *whorls* 5 only in the fragments now described, although there would be from 8 to 10 in perfect specimens ; they gradually increase in size and are flattened : *suture* slight, rounded below : *outer lip* incrassated, furnished inside with 8 to 10 spiral striæ or flutings, like those in *O. conoïdea*, *O. tenuis*, and *O. conspicua*, as also in *O. costaria* and other Crag species : *inner lip* forming an unusually thick and broad glaze on the pillar : *umbilicus* none : *tooth* large, solid, prominent, and winding round the pillar. Largest fragment L. 0·25, B. 0·085.

'Porcupine' Exp. 1870: Atl. St. 3, 6, 9, 26 ; Med. Adventure Bank. Many characteristic fragments of as many specimens of this curious species. Its general aspect reminds one of *O. scillæ* ; but the strong tooth and the inside fluting of the outer lip at once serve to distinguish the two species.

¹ Very long.

² Thick.

- ✓ 18. *ODOSTOMIA UNIFASCIATA*, Forbes. (Plate XXVI. fig. 8.)
Eulima unifasciata, Forb. Rep. Æg. Inv. (Rep. Brit. Assoc. 1843), p. 188.

'Porcupine' 1870: Med. St. Adventure Bank.

Distribution. Bay of Biscay ('Travailleur' Exp.), throughout the Mediterranean, off the Sahara and Azores ('Talisman' Exp.), New England (Verrill); 30-1622 fms.

Forbes's description is as follows:—" *Eulima unifasciata*, sp. nov. E. testâ turritâ, lævigatâ, politâ, albâ, fasciâ fulvâ cinctâ: anfractibus 11 planiusculis; aperturâ ovatâ. Long $0\frac{3}{12}$ unc. Lycia. Reg. viii." This description was evidently intended for the shell which is now figured, although the tooth must have escaped his notice; this was also the case with several species of *Odostomia*, described by Philippi as *Rissoa*.

The mouth is angular or sharply pointed above and below. A specimen from the Gulf of Naples, which has a conspicuous band and tooth, shows also a grooved or crenated mouth.

It is the *Eulimella smithii* of Verrill.

19. *ODOSTOMIA MINUTA*, H. Adams.

Syrnola minuta, H. Ad. in P. Z. S. 1869, p. 274, pl. xix. f. 10.

'Porcupine' Exp. 1870: Atl. St. 14, 30; Med. Adventure Bank.

Distribution. Bay of Biscay ('Travailleur' Exp. 1882), Mediterranean (*Susini*, *Monterosato*, *Spratt*, 'Shearwater' Exp. and 'Washington' Exp.), Orotava (*McAndrew*); 54-249 fms.

Fossil. Pliocene: Altavilla (*Brugnone*).

O. macella, *Brugnone*.

The operculum is of a pale yellowish colour. The coloured band is not always present. I do not know what character justified the separation of this species as a distinct genus, nor what is meant by the name *Syrnola*.

B. Striated lengthwise or reticulated, and dentated.

- ✓ 20. *ODOSTOMIA TRICINCTA*, Jeffreys.

O. tricincta, Jeffr. in Ann. & Mag. N. H. Febr. 1856, p. 185, pl. ii. f. 12, 13.

'Porcupine' Exp. 1870: Med. St. off Rinaldo's Chair.

Distribution. N.W. France (*Cailliaud*), Mediterranean and Adriatic, Canaries (*McAndrew*), and Madeira (*Watson*); 25-120 fms.

Fossil. Pliocene: Monte Pellegrino, Sicily (*Monterosato*).

Variable in size. It may possibly have been the *Rissoa doliolum* of Philippi; but his description and figure show no coloured band nor the tooth-like fold on the pillar, and the ribs are fewer in that species. Some specimens of the present species have only two bands. *O. tricincta* was apparently figured in Savigny's unfinished work, 'Histoire Naturelle de l'Égypte,' 1805-12, but it was never described or even named.

✓ 21. *ODOSTOMIA EXCAVATA*, Philippi.*Rissoa excavata*, Phil. Moll. Sic. i. p. 154, t. x. f. 6.*O. excavata*, B. C. iv. p. 158; v. p. 213, pl. lxxv. f. 6.

'Porcupine' Exp. 1870: Atl. St. Vigo B., 26; Med. 55.

Distribution. Great Britain and Ireland, N. and W. France and Spain, Mediterranean and Adriatic; 5-600 fms.*Fossil*. Pliocene: Coralline Crag, Italy, and Rhodes. Post-tertiary: Largs, Ayrshire (*Landsborough*); 5-10 ft.*Rissoa trinodosa* of Rayneval, besides the synonyms given in 'British Conchology.'22. *ODOSTOMIA HUMBOLDTI*, Risso.*Turbonilla humboldti*, Risso, Hist. Nat. de l'Eur. mér. 1826, t. iv. (Suppl.) p. 394, f. 63.

'Porcupine' Exp. 1870: Atl. St. Tangier B.; Med. 50, 50a, off Jijeli, G. Tunis.

Distribution. Mediterranean and Adriatic (*Risso*, *Stossich*, and others), Madeira (*Watson*); 15-120 fms.*Fossil*. Miocene: Vienna and Bordeaux Basins. Pliocene: Nice and Italy. Post-tertiary: Leghorn and Pozzuoli.

There are several obsolete and useless synonyms.

O. humboldti has a tooth-like fold on the pillar, placed differently from that in *Menestho* and *Actæon* or *Tornatella*, to which genera this species has been assigned by some conchologists.✓ 23. *ODOSTOMIA DECUSSATA*, Montagu.*Turbo decussatus*, Mont. Test. Br. (ii.) p. 322, t. 12, f. 4.*O. decussata*, B. C. iv. p. 145; v. p. 212, pl. lxxiv. f. 8.

'Porcupine' Exp. 1870: Atl. St. Vigo B., 36.

Distribution. Shetland to Guernsey, N. and W. France, Algiers, and Sicily; 12-70 fms.*Fossil*. Pliocene: Coralline Crag, Monte Mario, and Sicily.*Helix arenaria* of Maton and Rackett, ? *Pyramis spirolinus* of Brown.✓ 24. *ODOSTOMIA EXIMIA*, Jeffreys.*Rissoa eximia*, Jeffr. in Ann. & Mag. N. H. new ser. iv. p. 299.*O. eximia*, B. C. iv. p. 155; v. p. 213, pl. lxxv. f. 4.

'Lightning' Exp. St. 2, 5.

'Porcupine' Exp. 1869: 23a.

Distribution. Vadsö and Hammerfest to Shetland and the Minch in Ross-shire; 10-100 fms.*Fossil*. Post-tertiary: Christiania (*Sars*); 100 ft.Not *Turbonilla eximia* of A. Adams from Japan.✓ 25. *ODOSTOMIA SPIRALIS*, Montagu.*Turbo spiralis*, Mont. Test. Br. (ii.) p. 323, t. 12, f. 9.*O. spiralis*, B. C. iv. p. 154, pl. ii. f. 5; v. p. 213, pl. lxxv. f. 3.

'Porcupine' Exp. 1870: Atl. St. 3, Vigo B.; Med. 50.

Distribution. Öxfjord and Finmark to the Mediterranean and Adriatic; 8–40 fms.

Fossil. Pliocene: Leghorn and Monte Mario. Post-tertiary: Norway, W. Scotland, and Portrush; 3–460 ft.

A few obsolete synonyms.

As to the specific name *spiralis*, Monterosato says "poco corettamente da alcuni *spirialis*." Neither word is Latin, much less classical; *spirula* would be better.

✓ 26. *ODOSTOMIA INTERSTINCTA*, Montagu.

Turbo interstinctus, Mont. Test. Br. (ii.) p. 324, t. 12. f. 10.

O. interstincta, B. C. iv. p. 151; v. p. 213, pl. lxxv. f. 2.

'Lightning' Exp. St. 4.

'Porcupine' Exp. 1870: Atl. C. Sagres (var. *multicostata*), 26 (var. *suturalis*), Tangier B. (typical); Med. 50, Benzert Road, Rasel Amoush (typ. and var. *suturalis*, from the last three stations).

Distribution. Lofoten Isles and the western and southern coasts of Norway to the Mediterranean and Adriatic, Canaries and Madeira; 3–310 fms.

Fossil. Miocene: Vienna Basin (*Hörnes*), and Adour (*Grateloup*). Pliocene: Coralline and Red Crag, Pisa (*Manzoni*), Siena (*de Stefani* and *Pantanelli*), Monte Mario (*Rigacci*), Sicily (*Philippi* and others). Post-tertiary: Norway, West Cheshire, and Selsea; 8–240 ft.

The principal synonyms for varieties are *Chemnitzia terebellum*, *Rissoa gracilis* and *R. suturalis* of Philippi, and *O. moulinsiana* of Fischer.

This abundant and widely diffused species is of course extremely variable, and especially with respect to dimensions and the number of ribs. Other naturalists must exercise their own judgment as to considering *O. terebellum* or *moulinsiana* and *O. suturalis* alias *emaciata* or *sylvestri* or *penchinati*, as well as other forms described as species, distinct and not mere varieties. I would not have united them with the typical form, if it had not been for the examination and comparison of an immense number of intermediate specimens from different localities.

The variety *multicostata* may be distinguished from the typical form and any of the recorded varieties and so-called species by having the shape of a short cone and much more numerous and straight ribs.

27. *ODOSTOMIA JEFFREYSI*, Bucquoy, Dautzenberg, and Dollfus.

O. jeffreysi, Bucq., Dautz., and Dollf. Moll. mar. Roussillon, Fasc. 4, 1883, p. 170, pl. 20. f. 10; var. *flexicosta*.

'Porcupine' Exp. 1870: Atl. St. 26–34; Med. 50, Adventure Bank.

Distribution. Gulf of Lyons to the Archipelago; 60–600 fms.

This seems to differ from any of the numerous varieties of *O. interstincta* in its comparatively minute size, oval shape, and having

fewer, stronger, and curved ribs. But the specific name must be changed, because it was preengaged by Koch and Weichmann for a Miocene shell.

C. Turbonilla or *Chemnitzia*. Striated lengthwise or reticulated, and usually toothless.

D'Orbigny, in his work on the Mollusca of the Canary Isles, proposed *Chemnitzia* as a subgenus of *Melania*, and said nothing about the heterostrophe apex or any other character which could distinguish it from *Eulima*, except that it was "fortement costulée."

✓ 28. *ODOSTOMIA INDISTINCTA*, Montagu.

Turbo indistinctus, Mont. Test. Br. Suppl. p. 129.

O. indistincta, B. C. iv. p. 149; v. p. 213, pl. lxxv. f. 1.

'Porcupine' Exp. 1869: St. 18. 1870: Atl. Vigo B. (var. *brevior*), Tangier B.

Distribution. Bergen southwards to the Mediterranean and Adriatic, Madeira, and Canaries; 4-60 fms.

Fossil. Miocene: Vienna Basin (*Hörnes*). Pliocene: Coralline Crag and Italy. Post-tertiary: Norway, West of Scotland, Belfast, and Selsea; 0-50 ft.

In addition to the synonyms given in 'British Conchology' are *Chemnitzia areolata* of Rayneval, *Truncatella juliae* of de Folin, and *O. (Pyrgulina) nanodea* of Monterosato.

The late General Stefanis obligingly gave me a specimen from the Gulf of Naples, which has the peculiar shape and the delicate flexuous sculpture of the species, as well as a conspicuous tooth in the middle of the pillar. Professor Stossich showed me a similar specimen from the Adriatic. It is quite impossible, even with the aid of a lively imagination, to distinguish *Turbonilla* or *Chemnitzia* from *Odostomia* by any fixed character.

✓ 29. *ODOSTOMIA SIGMOIDEA*¹, Monterosato MS. (Plate XXVI. fig. 9.)

SHELL cylindrical, rather thin, semitransparent, and glossy: *sculpture*, numerous but not close-set longitudinal ribs, of which there are about 25 on the last whorl and twenty on the next; these are oblique at first and afterwards become flexuous; their interstices are nearly equal in breadth to the ribs, and are throughout finely and closely striated across or spirally; the base is marked by spiral striæ only, as the ribs do not extend below the periphery; apex quite smooth and polished: *colour* white: *spire* gradually tapering to a blunt point: *whorls* 8, somewhat compressed; the last occupies nearly two fifths of the shell: *suture* slight and shallow, rather oblique: *mouth* oval, acute-angled above and rounded below; length equal to one fifth of that of the spire: *outer lip* flexuous: *inner lip* narrow, reflected on the pillar, behind which is a small and narrow chink: *tooth* or columellar fold none observable. L. 0.15. B. 0.05.

¹ From the ribs resembling the Greek letter *sigma*.

'Porcupine' Exp. 1870: Atl. St. Tangier B. Two specimens.

Distribution. Algiers, a fragment (*Joly*, f. *Monterosato*), Palermo, a fragment (*Monterosato*); 163½ fms.

This species differs from *O. indistincta* in having fewer and larger ribs with more numerous and much finer spiral striæ; the whorls are not so convex, and the suture is consequently slighter or shallower. But I must admit that it is not a satisfactory and well-established species.

✓ 30. *ODOSTOMIA FLEXUOSA*¹, Jeffreys. (Plate XXVI. fig. 10.)

SHELL oblong, rather thin, semitransparent, and glossy: *sculpture*, sharp and flexuous longitudinal ribs, of which there are about 20 on the last whorl and 15 on the next or penultimate whorl; these commence in a nodose and abrupt manner from just below the suture, and almost disappear at the periphery, where they are crossed by a few spiral striæ: *colour* white: *spire* turreted; apex truncated: *whorls* 5, compressed; the last occupies more than half the shell with the mouth placed upwards: *suture* narrow but distinct, nearly straight: *mouth* oval, inflected above and rounded below: *outer lip* angular above and gently curved in the middle: *inner lip* filmy on the upper part and reflected on the lower part of the pillar, behind which is a small and narrow chink. L. 0.1. B. 0.05.

'Porcupine' Exp. 1870: Med. St. 55. Two specimens.

✓ 31. *ODOSTOMIA CLATHRATA*, Jeffreys.

O. clathrata, Jeffr. in Ann. & Mag. N. H. 2nd ser. ii. p. 345: B. C. iv. p. 148; v. p. 212, pl. lxxiv. f. 9.

'Porcupine' Exp. 1870: Med. St. Adventure Bank (fragment).

Distribution. Birterbuy B., Connemara (*Barlee* and *J. G. J.*), throughout the Mediterranean and Adriatic, Madeira (*Watson*), Canaries (*McAndrew*); 20–25 fms.

Fossil. Miocene: Vienna Basin (Coll. Hörnes in mus. Vind.)! Pliocene: Monte Mario and Sicily.

✓ 32. *ODOSTOMIA SCALARIS*, Philippi.

Melania (afterwards *Chemnitzia*) *scalaris*, Phil. Moll. Sic. i. p. 157, t. ix. f. 9.

O. scalaris, B. C. iv. p. 160; v. p. 213, pl. lxxv. f. 7, and var. 8.

'Porcupine' Exp. 1870: Atl. St. Vigo B.; Med. 45, Rasel Amoush. All typical specimens.

Distribution. Typical form: Norway (*McAndrew*), Unst, in Shetland (*J. G. J.*), western and southern coasts of England and Ireland, northern and western coasts of France, Spain and Portugal, Mediterranean and Adriatic, Madeira; 8–108 fms. Var. *rufescens*. Finmark southwards to the Hebrides and county Antrim; 10–90 fms.

Fossil. Pliocene: Coralline Crag and Italy. Post-tertiary: Norway (var. *rufescens*); 70–100 feet. Not *Odontostoma scalaris* of Sandberger from the Mayence Basin.

¹ Having flexuous ribs.

Neither is the present species the *Turritella interrupta* of Totten (as stated in 'British Conchology'), which I am now disposed, from specimens and further information, to refer to the following species.

33. ODOSTOMIA RUFa, Philippi.

Melania (afterwards *Chemnitzia*) *rufa*, Phil. Moll. Sic. i. p. 156, t. ix. f. 7.

O. rufa, B. C. iv. p. 162; v. p. 213, pl. lxxvi. f. 1, and var. 2.

'Porcupine' Exp. 1869: St. 13, 14, 18, North Channel. 1870: Atl. 3a, 9, 13, 24, 27, 28, (and var. *fulvocincta*). Var. *densicostata* (*Chemnitzia densicostata*, Ph. Moll. Sic. ii. p. 137, t. xxiv. f. 9), 1870: Atl. 3, Setubal B., 24, 29, 30; Med. Adventure Bank.

Distribution. Typ. Anglesea to Cornwall, Atlantic coasts of France and Portugal, Mediterranean and Adriatic, Madeira and Canaries, New Brunswick, Massachusetts, New England, and North Carolina; 0-365 fms.

Var. *fulvocincta*, Lofoten I. to the Dogger Bank and Ireland, Brittany (*Cailliaud*), Tuscany (*Appelius*)!; 18-60 fms. Var. *densicostata*. Gulf of Gascony, Mediterranean and Adriatic, off Culebra, St. Thomas ('Challenger' Exp.); 30-390 fms.

Fossil. Pliocene: Coralline Crag, Biot, and Italy; var. *fulvocincta*, Lombardy (coll. Brocchi)! Post-tertiary: var. *fulvocincta*. Norway, Selsea; 0-80 ft. Var. *densicostata*, Sicily (*Brugnone*).

Further examination and comparison of the typical form and its varieties with *Turritella interrupta* of Totten, which is common on the eastern coasts of North America, as well as my own dredging off Massachusetts, since the publication of 'British Conchology' (when I referred that species to *O. scalaris*), have satisfied me that it is the same species as *O. rufa* and not *O. scalaris*. The figure in Gould's work is incorrect and misleading. Totten's specific name is prior to that of Philippi, and therefore ought to be adopted. I believe that *Turbonilla rathbuni* of Verrill and Smith is a pretty and deep-water form of the present variable species.

The variety *densicostata* is much smaller, narrower, and more slender than the typical form, and is sometimes banded like the variety *fulvocincta*. The ribs appear to be more crowded, because the shell is narrower, and they differ in the degree of obliquity. Specimens from Station 3 of the 'Porcupine' Expedition of 1870 and from Corsica are intermediate in every respect between the typical form and the variety *densicostata*.

34. ODOSTOMIA STRIATULA, Linné.

Turbo striatulus, L. S. N. p. 1238.

Turritella potamoides, Cantraine, Mal. Med. pl. vi. p. 25.

'Porcupine' Exp. 1870: Med. St. 55, Benzert Road, G. Tunis, Adventure Bank.

Distribution. Throughout the Mediterranean and Adriatic; 0-120 fms.

Fossil. Pliocene: Coralline Crag, Biot, Italy, Rhodes.

Turritella potamoides, Cantraine, *Melania* (afterwards *Chemnitzia*) *pallida*, Philippi, *Parthenia varicosa*, Forbes, and *Chemnitzia costaria*, S. Wood.

In a specimen from the Gulf of Tunis the throat or inside of the upper lip is crenated, like *Chemnitzia costaria* of the Crag.

35. ODOSTOMIA MAGNIFICA, Seguenza.

Turbonilla magnifica, Seg., Le formazione terziarie nella Provincia di Reggio (Calabria), 1879, p. 264, t. xvi. f. 25.

'Porcupine' Exp. 1870: Atl. St. 6, 16, 25, 27-28.

Distribution. Vigo (*McAndrew*), Bay of Biscay ('Travailleur' Exp. 1880-1881), off C. Verd I., Azores ('Talisman' Exp.), New England (*Verrill*); 217-1062 fms.

Fossil. Pliocene: Reggio, Calabria (*Seguenza*)!

This fine species varies considerably in shape, as well as in the number and direction of the ribs, which are sometimes straight and sharp, and in other specimens oblique and flattened; but there is a character common and peculiar to all the specimens (European, American, and fossil) which I have examined, viz. the close striation length-wise by delicate and microscopical lines which cover the whole of the shell. These striæ are not mere marks of growth, but a distinct kind of sculpture.

Turbonilla bushiana of *Verrill*. Not *Turbonilla meneghini* of *Libassi*, according to the figure and a typical specimen received from Professor *Seguenza*; nor is it *Turbonilla speciosa* of *H. Adams*. But the last two species are allied to the present, as well as *Turbo plicatulus* of *Brocchi*.

Fragments of recent specimens from the 'Porcupine' Expedition show that this species attains much larger dimensions than those given in the descriptions of *Seguenza* and *Verrill*.

✓ 36. ODOSTOMIA LACTEA, Linné.

Turbo lacteus, L. S. N. p. 1238; Cantr. Mal. Med. pl. vi. f. 21.

O. lactea, B. C. iv. p. 164; v. p. 213, pl. lxxvi. f. 3.

'Porcupine' Exp. 1869: St. 9. 1870: Atl. Vigo B.; Med. Algeciras B., G. Tunis, Adventure Bank.

Distribution. Tromsø to the Archipelago, Adriatic, Marocco, Canary I., Madeira, and Azores; 0-50 fms. Perhaps this may be *Chemnitzia nivea* of *Stimpson* from 40 fms. off Grand Maran, which he described as "T. aciculata, subcylindrica, alba, nitida; anfractibus planatis, longitudinaliter plicatis, plicis rectis, interstitiis lævissimis. Long. 0.28; lat. 0.04 poll." Not Red Sea, as given by *Philippi* on the authority of *Hemprich* and *Ehrenberg*.

Fossil. Miocene: Vienna and Bordeaux Basins. Pliocene: Coral-line and Red Crag, Belgian Crag, Biot (*Battersby*), Nice (*Allan*), Italy. Post-tertiary: Belfast, Selsea, Leghorn, Taranto, Morea, and Rhodes.

Turbo albus, *Pennant*, *T. acutus*, *Donovan*, *T. elegantissimus*, *Montagu*, *Turbonilla plicatula*, *Risso*, *Melania campanilla*, *Philippi*, and several later synonyms which it is unnecessary to notice. *Risso's*

Eulima elegantissima, for which he misquoted Montagu, appears to be *E. polita*. Not *O. lactea* of d'Orbigny, nor of Dunker, nor of Angas.

This common species is consequently variable as regards the straight or oblique direction of the ribs, as well as the comparative breadth of the shell. The pillar has occasionally a tooth-like fold.

✓ 37. *ODOSTOMIA SINUOSA*¹, Jeffreys. (Plate XXVII. fig. 1.)

SHELL resembling a short pyramid, rather thin, semitransparent and glossy: *sculpture*, numerous, fine, flexuous and close-set longitudinal ribs, arranged obliquely, and commencing abruptly at the top of each whorl, and not continued below the periphery; there are about 25 on the last whorl; the first or nuclear whorl is, as usual, quite smooth: *colour* white: *spire* rather short, and ending in a sharp point: *whorls* 8 (exclusive of the nucleus), convex and rapidly enlarging; the last occupies more than two fifths of the shell: *suture* narrow and oblique: *mouth* irregularly rhomboidal, equal in length to between one third and one fourth of the spire: *outer lip* inflected at the top, gently curved in the middle, and semi-circular at the bottom: *inner lip* expanded and thickened: *tooth* or columellar fold slight but distinct. L. 0.175. B. 0.05.

'Porcupine' Exp. 1870: Med. St. Adventure Bank. A single specimen.

Distribution. Mediterranean (Italian Exp.), off west coast of Africa ('Talisman' Exp.); 681 fms.

Allied to *O. lactea*, but differs in its more conical and less cylindrical shape, being proportionally broader at the base, and the ribs are more decidedly flexuous and oblique. In *Chemnitzia obliquata*, of Philippi, the whorls are fewer and more tumid.

✓ 38. *ODOSTOMIA PUSILLA*, Philippi.

Chemnitzia pusilla, Phil. Moll. Sic. ii. p. 224. t. xxviii. f. 21.

O. pusilla, B. C. iv. p. 167, v. p. 215, pl. lxxvi. f. 4.

'Porcupine' Exp. 1870: Atl. St. Vigo B.; Med. 50, Adventure Bank.

Distribution. Birterbuy Bay, W. Galway (*Walpole*), British Channel and South of England, Atlantic coasts of France, throughout the Mediterranean and Adriatic, and Madeira (*Watson*); 10-100 fms.

Fossil. Pliocene: Biot, Italy. Post-tertiary: Morea and Rhodes.

On further consideration I must hesitate in considering this species, which I described and figured under the above name, as that of Philippi. The size given by him is much smaller, the ribs are said to be set obliquely, and he noticed transverse or spiral striæ, which my species does not possess. Judging from the excellent figure (plate 21, fig. 12) of "*Turbonilla gradata*, Monterosato," in the 'Mollusques du Roussillon' of Messrs. Bucquoy, Dautzenberg, and Dollfus, which represents a variety of the present species, I am inclined to adopt the latter name. It is certainly distinct from *O. lactea* and its varieties.

¹ Full of curves.

✓ 39. ODOSTOMIA DELICATA, Monterosato.

Chemnitzia gracilis, Phil. Moll. Sic. ii. p. 137, t. xxiv. f. 11.

O. delicata, Monter. J. de Conch. 1874, p. 267.

'Porcupine' Exp. 1869: St. 18, Donegal B. 1870: Atl. 17.

Distribution. Bundoran, Co. Donegal, with *Circulus striatus* (J. G. J.), Loire-Inférieure (Cailliaud), Gulf of Gascony (de Folin), Mediterranean from Spezia to Alexandria, and Adriatic; 18–120 fms.

Not *Turbo gracilis* of Brocchi, nor *Chemnitzia gracilis* of de Koninck, fossil species of *Odostomia*.

The columellar fold or tooth is sometimes observable in this species. The following is my note as to the animal.—“*Body* clear white, with a narrow dark streak down each side: *mantle* thick: *head* or snout (mentum) narrower than the foot and extending beyond it; extremity notched in the middle: *tentacles* leaf-like and folded, proportionally large: *eyes* small and black, sessile on the inner side of the tentacles at their base: *foot* long, squarish or truncated in front, with angular corners, pointed behind. Active and not very shy or timid.”

✓ 40. ODOSTOMIA ACUTICOSTATA¹, Jeffreys. (Plate XXVII. fig. 2.)

SHELL obeliscal or spit-shaped, rather thick, opaque, and glossy: *sculpture*, several equal-sized, narrow, linear, and oblique longitudinal ribs, about 20 on the last whorl; they are considerably narrower than their interstices, and do not extend beyond the periphery, where they are intercepted by a thread-like spiral stria; the base and apex are quite smooth: *colour* white: *spire* long, turreted, and gradually tapering: *whorls* 9 (including the nucleus), rather convex, the last occupying about a third of the shell; nucleus regularly spiral and intorted: *suture* shallow but well defined, nearly straight: *mouth* small, squarish: *outer lip* contracted above and curved below: *inner lip* and pillow thickened: *umbilicus* and *tooth* none. L. 0.125. B. 0.05.

'Porcupine' Exp. 1870: Med. St. 45, Rasel Amoush. Two specimens.

Distribution. Cape Breton (de Folin), Palermo (Monterosato), Gulf of Gabes on the Tunisian coast (Dautzenburg); 20–103 fms.

The ribs are not so close-set or contiguous as in *O. lactea* and other species of the same section, and they are much narrower than the interspaces.

Not *Turbonilla acuticostata* of Speyer, a Miocene species, which is a synonym of *Auricula costellata* of Grateloup.

✓ 41. ODOSTOMIA FULGIDULA², Jeffreys. (Plate XXVII. fig. 3.)

SHELL shaped like a short cylinder, strong for its minute size, nearly transparent, and of a prismatic lustre: *sculpture*, several straight or linear, and sharp longitudinal ribs, which are narrower than their interstices, and are apparently but not really continuous; there are 15 or 16 on the last whorl, and they do not extend below the

¹ Sharply ribbed.

² Somewhat bright.

periphery; base and nucleus ribless; the whole surface of the shell (except the nucleus) is covered with extremely numerous and close-set spiral striæ, which are discernible only with the aid of a microscope: *colour* glassy: *spire* rather long, and gradually tapering to a blunt point: *suture* slight: *whorls* 6, besides the nucleus, which is spirally twisted and intorted; the last or body-whorl occupies two fifths of the spire: *mouth* oval, acutangular above and curved below: *outer lip* thin: *inner lip* inconspicuous: *umbilicus* none, but the base is shallowly excavated. L. 0.075. B. 0.035.

'Porcupine' Exp. 1870: Atl. St. 13. Half a dozen living specimens.

This beautiful little shell may be distinguished by the numerous microscopic spiral striæ, as well as by its shape and prismatic lustre.

✓ 42. *ODOSTOMIA ATTENUATA*¹, Jeffreys. (Plate XXVII. fig. 4.)

SHELL club-shaped, thin, semitransparent, and very glossy: *sculpture*, long, sharp, and curved longitudinal ribs, from 18 to 20 on the last whorl, and with equally broad interstices; these ribs are not continued beyond the periphery, and in one specimen they nearly disappear on the last whorl; apex quite smooth: *colour* whitish, with a faint tinge of yellowish-brown: *spire* elongated, and gradually tapering to a blunt and apparently truncated point: *suture* well defined: *whorls* 6, exclusive of the nucleus, which is globular, spiral, and intorted; the last whorl occupies two fifths of the spire: *mouth* and *lips* as in the last species: *base* sloping. L. 0.125. B. 0.035.

'Porcupine' Exp. 1870: Atl. St. 17; Med. 55.

Distribution. Gulf of Marseilles ('Travailleur' Exp.), off western coast of Africa ('Talisman' Exp.); 363-1259 fms.

✓ 43. *ODOSTOMIA COMPRESSA*², Jeffreys. (Plate XXVII. fig. 5.)

SHELL cylindrical, compressed in the middle of each whorl, rather thick, semitransparent and glossy: *sculpture*, sharp and straight longitudinal ribs, which commence at the top of each whorl and more or less disappear at the periphery; their number is about 25 on the last whorl; they are usually of the same breadth as the interstices, but occasionally narrower; base and apex quite smooth: *colour* whitish, with a broad but obscure spiral band of reddish-brown in a young specimen: *spire* turreted, elongated and gradually tapering: *suture* narrow but distinct: *whorls* 10, flattened, contracted in the middle of each; the last occupies about two fifths of the spire; nucleus twisted: *mouth* oval, acutangular above, rounded below: *outer lip* incurved, and flexuous in the middle: *inner lip* thickened and somewhat expanded: *base* sloping. L. 0.25. B. 0.075.

'Porcupine' Exp. 1870: Atl. St. 17, 36; Med. 40, Benzert Road.

Distribution. Gulf of Marseilles ('Travailleur' Exp.), off the west coast of Africa, C. Verd I., and Azores ('Talisman' Exp.), off the Azores ('Challenger' and 'Talisman' Exp.); 363-1622 fms.

¹ Attenuated or narrowed.

² Pressed or squeezed together.

✓ 44. ODOSTOMIA PAUCISTRIATA¹, Jeffreys. (Plate XXVII. fig. 6.)

SHELL forming an elongated cone, rather thick, semitransparent, and of a prismatic lustre: *sculpture*, straight, slight, and irregular longitudinal ribs, about 20 on the last whorl, but varying in number, extension, and size: *colour* white: *spire* produced, and somewhat abruptly tapering: *suture* rather deep, nearly straight: *whorls* 8 besides the nucleus, moderately convex but not tumid; the last occupies two fifths of the spire; nucleus twisted outwards: *mouth* pear-shaped, pointed above and rounded below: *outer lip* thin: *inner lip* thickened: *base* angulated in the young. L. 0·275. B. 0·085.

'Porcupine' Exp. 1870: Med. St. Benzert Road. Four specimens of different sizes.

Distribution. Bay of Biscay ('Travailleur' Exp. 1880 and 1881), Palermo and S. Vito (*Monterosato*), off west coast of Africa ('Talisman' Exp.), off Culebra, Danish W. Indies ('Challenger' Exp.); 108-681 fms.

Fossil. Pliocene: Messina (*Seguenza*), Altavilla (*Monterosato*)!

Although this appears to differ from *O. compressa* in being conical instead of cylindrical, as well as in the less compression of the whorls and the irregularity of the sculpture, I am not satisfied that they are distinct species. I therefore give both provisionally. Two specimens of the present species have a rather strong tooth-like fold on the inside of the pillar.

✓ 45. ODOSTOMIA SEMICOSTATA², Jeffreys. (Plate XXVII. fig. 7.)

SHELL cylindrical, rather thick, semitransparent and glossy: *sculpture*, a few slight longitudinal ribs, sometimes covering the top whorls only, but in most specimens disposed irregularly over the shell; in one specimen the whole of the surface is seen under the microscope to be finely striated in a spiral or transverse direction: *colour* white: *spire* elongated and ending somewhat abruptly in the nuclear point: *whorls* 8 besides the nucleus; they are rounded but not convex, and are compressed in the middle; the last occupies about one third of the spire; nucleus bulbous and regularly spiral, like all other species of this genus: *suture* narrow: *mouth* trapezoid: *outer lip* inflected and pointed above, contracted in the middle, and curved below: *inner lip* thickened: *base* somewhat angulated, particularly in the young: *pillar* nearly straight: *tooth* or columellar fold sunken but conspicuous in a broken specimen. L. 0·15. B. 0·035.

'Porcupine' Exp. 1870: Atl. St. 26-30.

Distribution. C. Breton, Gulf of Gascony (*de Folin*)!

D. *Eulimella*. Cylindrical, smooth, and toothless.

✓ 46. ODOSTOMIA SCILLÆ, Scacchi.

Melania scillæ, Sc. Notizie int. alle Conch. p. 51, t. ii. f. 2.

O. scillæ, B. C. iv. p. 169; v. p. 213, pl. lxxvi. f. 5.

'Lightning' Exp. St. 2.

¹ Having few ribs.

² Half-ribbed.

'Porcupine' Exp. 1869 : 3, 6. 1870 : Atl. 6, 9, 26-29 ; Med. 50, Rasel Amoush, Adventure Bank.

Distribution. Finmark to the Mediterranean, Canaries, Madeira, off C. Verd I. and west coast of Africa ('Talisman' Exp.); 12-1192 fms.

Fossil. Miocene : Vienna Basin (Hörnes)!, N. W. Germany (Philippi). Pliocene : Biot and throughout Italy. Post-tertiary : Christiania, Rhodes ; 0-100 ft.

Varies in the length of the spire and in the comparative breadth of the shell.

✓ 47. *ODOSTOMIA COMPACTILIS*, Jeffreys.

O. scillæ, var. *compactilis*, B. C. iv. p. 169.

Eulimella compactilis, G. O. Sars, Moll. arct. Norv. p. 208, t. 22. f. 15.

'Porcupine' Exp. 1869 : St. 4, 18, 23. 1870 : Atl. 3. A single specimen from each station.

Distribution. Lofoten I. and W. Norway, Shetland and Hebrides ; 50-300 fms.

Possibly *O. (Eulimella) superflua* of Monterosato, from Palermo.

✓ 48. *ODOSTOMIA ACICULA*, Philippi.

Melania (afterwards *Eulima*) *acicula*, Phil. Moll. Sic. i. p. 158, t. ix. f. 6.

O. acicula, B. C. iv. p. 170 ; v. p. 213, pl. lxxvi. f. 6.

'Porcupine' Exp. 1869 : St. 18, 19, 25, the Minch. 1870 : Atl. 3, 9, Vigo B., Setubal B., 26-28, 31-34 ; Med. 55, Benzert Road, Rasel Amoush, G. Tunis, Adventure Bank.

Distribution. Everywhere in the eastern portion of the North Atlantic from Bergen to the Bay of Biscay, as well as in the Mediterranean and Adriatic, Corea (*St. John*) ; 8-645 fms.

Fossil. Pliocene : Red Crag, Biot, and Italy. Post-tertiary : Christiania and Caithness.

Some specimens from different localities exhibit a more or less conspicuous tooth.

As to the specific name, Monterosato observed that long before Philippi's work, Lamarck had used it for another species (a Grignon fossil) of the present genus ; but the figure (pl. 60, f. 9) in the 8th volume of the 'Annales du Muséum,' which Deshayes in his second edition of the 'Histoire naturelle des animaux sans vertèbres,' refers to the *Auricula (acicula)* of the 6th volume of the 'Annales,' can hardly be correct, because none of the other figures in the same plate correspond with either the numbers or the brief descriptions given by Lamarck in his list of species. Indeed, Deshayes says, as to *Auricula acicula*, "Il est très-probable que cette espèce n'est point une Auricule, mais une Tornatelle allongée." The genus *Auricula* of Lamarck was a heterogeneous assemblage of species, and included *Melampus*, *Actæon* or *Tornatella*, *Odostomia*, *Pyramidella*, and *Ringicula*. The peculiar character of the *Pyramidellidæ*, viz. the sinistral nucleus, was not noticed by Lamarck or Deshayes.

49. *ODOSTOMIA VENTRICOSA*, Forbes.

Parthenia ventricosa, Forb. Rep. Æg. Inv. (1843), p. 188.

O. acicula, var. *ventricosa*, B. C. iv. p. 171 ; v. p. 213, pl. lxxvi. f. 7.

'Lightning' Exp. St. 2, 5.

'Porcupine' Exp. 1869 : 25. 1870 : Atl. 9, 17^a, 26-28^a ; Med. Benzeret Road, Rasel Amoush, Adventure Bank.

Distribution. Lofoten I. to the Hydra Channel and Crete, Adriatic, off C. Verd I. ('Talisman' Exp.), Madeira (*Watson*) ! ; 10-1192 fms.

Fossil. Pliocene : Italy. Post-tertiary : Biot and Leghorn.

Although it is difficult, if not impossible, to distinguish this from *O. acicula*, except as a variety, I will defer to the opinion of my friend Professor G. O. Sars, and consider them separate species. This kind of distinction is not very material in a scientific point of view, where there is any valid or peculiar character. The present species has a more delicate texture, the whorls are more swollen, the suture is consequently deeper, and the shell becomes more attenuated towards the apex. Nevertheless, there are intermediate gradations, as is the case with other allied forms. Both species have several synonyms. In the Annals and Magazine of Natural History for 1848 I described the present species under the name of *Eulimella gracilis* ; but Forbes did not recognize it as his *Parthenia ventricosa*. He described his shell as "subumbilicate," a character which does not belong to mine. The animal is described in the Supplement to 'British Conchology.'

PYRAMIDELLA NITIDULA, A. Adams. (Plate XXVII. fig. 8.)

Syrnola (afterwards changed to *Obeliscus*) *nitidula*, A. Adams in Ann. & Mag. N. H. 1860, p. 335.

'Porcupine' Exp. 1870 : Atl. St. 3^a (var. *exilis*), 9, 16, 17, 28-30 ; Med. 45, 55 (var. *exilis*), Adventure Bank.

Distribution. Bay of Biscay ('Travailleur' Exp. 1881 and 1882), European and African coasts of the Mediterranean, off the Cape de Verd I. ('Talisman' Exp.), St. Thomas, D. W. I. and Fayal ('Challenger' Exp.), Japan and Corea (*A. Adams* and *St. John*) ; 40-487½ fms.

Fossil. Pliocene : Reggio (*Sequenza*).

Synonyms. *Pyramidella minuscula* and *P. mediterranea* of Monterosato, *Obeliscus sufarcinatus* and *O. tinctus* of Watson. Perhaps the variety, which I have named *exilis*, may be a distinct species. It is much smaller, narrower, and spindle-shaped ; but the specimens are too young or immature and imperfect for complete description.

The shell being deeply umbilicated may constitute the type of a section which I would name *Tiberia*, in honour of that excellent naturalist Dr. Nicola Tiberi of Portici near Naples.

I have carefully compared my 'Porcupine' and Mediterranean specimens with those from Japan and Corea, which I received from

the late Mr. Arthur Adams and my friend Captain St. John, and I cannot detect the slightest difference between any of them in shape, coloured band, umbilicus, or dentition of the pillar. *P. læviuscula* of the Crag has no umbilical perforation; otherwise the recent and fossil species are exactly similar. Some of the recent as well as Crag specimens, and those of *P. plicosa* (if this be not the same as the Crag species) have the throat or inside of the outer lip thickened and crenated, as in *Odostomia conoidea* and other species of that genus. It must be borne in mind that species of different genera are common to the North Atlantic and North Pacific Oceans, as well as to the Crag, e. g. *Pecchiolia acuticostata*.

✓ *MATHILDA QUADRICARINATA*, Brocchi.

Turbo quadricarinatus, Br. Conch. Foss. Subap. ii. p. 375, t. vii. f. 6.

M. quadricarinata, Kobelt in Jahrb. d. d. Mal. Ges. 1874, p. 226, t. ii. f. 2, 2^a.

'Porcupine' Exp. 1870: Atl. St. off C. Sagres, 26-30, 36; Med. 50, 50^a, Benzert Road, Rasel Amoush, Adventure Bank.

Distribution. Bay of Biscay ('Travailleur' Exp. 1881), Mediterranean and Adriatic, Madeira (*Watson*)!; 8-227 fms.

Fossil. Miocene: Maine et Loire (*Baudin*), Malaga (*Duncan*). Pliocene: Antwerp Crag (*Omalius*), Biot, and Italy.

A Sicilian specimen, kindly sent me by the late Professor Aradus, measures nearly an inch and a quarter in length and $\frac{7}{10}$ of an inch in breadth. The sculpture of this species varies considerably, and this has, of course, given rise to several synonyms, including *Eglisia macandreae* of A. Adams, and two or three so-called species of Brugnone.

The correct position of the genus *Mathilda*, O. Semper, 1865, is rather questionable. It certainly approaches *Turritella* in some respects; and my only reason for placing it provisionally in the *Pyramidellidæ* is the heterostrophe or sinistrorsally spiral apex. I have thought it desirable to give (Plate XXVII. fig. 9) a magnified figure of this character.

I subjoin a description of the animal taken from a living specimen during the 'Porcupine' Expedition of 1870:—*Body* cream-colour: *tentacles* thread-shaped, smooth, very long and slender, bluntly pointed, and diverging: *eyes* proportionally large, seated on small tubercles or bulbs on the outer side of the tentacles about one fourth from their base: *foot* large, in front deeply bilobed with remarkably long auricles, behind angulated on the upper part and rounded at the tail or extremity; the foot-lobes are jagged inside, and double-edged in that part with a row of close-set short and exquisitely fine cilia which are in continual motion: *operculum* chitinous, rather solid, multispiral with umbilicated whorls, like that of *Turritella terebra*. Animal active and bold.

Family XVIII. EULIMIDÆ.

✓ Genus GEGANIA¹, Jeffreys.

SHELL conical, reticulated, not umbilicated; nucleus globular and intorted, not spiral, nor sinistral. Differs from *Mathilda* in having a short spire and an intorted but not a heterostrophe nucleus.

Perhaps this genus, which in a great measure is founded on negative characters, may be the type of a separate family. The shell certainly is not smooth and polished like *Eulima*.

GEGANIA PINGUIS², Jeffreys. (Plate XXVII. fig. 10.)

SHELL forming a short cone, rather thin, opaque and of a dull hue: *sculpture*, several spiral ridges, which are crossed by much more numerous and flexuous longitudinal striæ, so as to cause a partial decussation; the spiral ridges vary considerably in number and strength, and sometimes they are alternately large and small, but they become at the base crowded and fine revolving striæ; apex smooth and glossy: *colour* whitish: *spire* short, bluntly pointed: *whorls* 5, swollen; the last occupies more than two thirds of the shell; nucleus bulbous, introverted: *suture* deep: *mouth* squarish, acutangular above and nearly rectangular below: *outer lip* semi-circular except for the upper corner of the mouth: *inner lip* reflected, broader on the lower part of the pillar, which is very gently curved: *base* expanded, slightly concave or depressed but not umbilicated nor angulated. L. 0·3. B. 0·16.

'Porcupine' Exp. 1870: Atl. St. 16, 17, 17 a.

✓ 1. EULIMA SUBULATA, Donovan.

Turbo subulatus, Don. Br. Sh. pl. clxxii.

E. subulata, B. C. iv. p. 208; v. p. 215, pl. lxxvii. f. 7.

'Porcupine' Exp. 1869: St. 2, 9, 18 (and var. *nana*). 1870: Atl. Vigo B., 29, 30 (var. *pallidula*); Med. 50, 55, Benzert Road, G. Tunis, Adventure Bank. Variety *pallidula*; bands of a paler colour, and more or less interrupted.

Distribution. Dublin Bay and other parts of Ireland, Anglesea, and southern coasts of England, Atlantic coasts of France and Lusitania, throughout the Mediterranean and Adriatic, Canaries, Madeira, and Azores; 2-227½ fms. I suspect that the following localities may have been misapplied to this species instead of to *E. bilineata*:—Scarborough (*Bean*); Orkneys, 12 fms. (*Forbes*); Shetland, 5-90 fms. (*Forbes*).

Fossil. Miocene: Vienna and Bordeaux Basins, N.W. Germany, Transylvania, Podolia, and Volhynia. Pliocene: Coralline and Antwerp Crags, France and Italy.

Of the numerous synonyms, which it is unnecessary to recapitulate, *glaber* of Da Costa is prior to *subulata* and every other; but the present name has been sanctioned by use. The dwarf variety (*nana*) shows that size is not the only character which distinguishes

¹ The name of one of the Vestal Virgins.

² Plump.

this species from *E. bilineata*; this variety has the usual slender shape and coloured markings of *E. subulata*, and is Mediterranean as well as Atlantic.

✓ 2. *EULIMA BILINEATA*, Alder.

E. lineata (as probably of Sowerby, but proposed to be changed to *bilineata*), Ald. Cat. Moll. North. & Durh. in Trans. Tyn. Nat. Field Club, p. 47.

E. bilineata, B. C. iv. p. 210; v. p. 215, pl. lxxvii. f. 8.

'Lightning' Exp.: St. 2, 5.

'Porcupine' Exp. 1869: 15, 18, 23a, N. Channel. 1870: Atl. 3a, 26; Med. Benzert Road, Rasel Amoush, Adventure Bank.

Distribution. Hammerfest, Lofoten I., and Bodö to the Adriatic and Alexandria, off west coast of Africa ('Talisman' Exp.); 0-681 fms.

Fossil. Pliocene: Sicily. Post-tertiary: Norway and Belfast; 100 ft.

This pretty little shell is closely allied to *E. subulata*, and may be regarded as a "critical" species. Specimens from Skye and Belfast are much larger than the dwarf variety of *E. subulata*. The characteristic differences are pointed out in 'British Conchology.' Some specimens of the present species are slightly curved.

✓ 3. *EULIMA JEFFREYSIANA*, Brusina. (Plate XXVIII. fig. 1.)

Leiostraca jeffreysiana, Brus. in J. de Conch. xvii. (1869), p. 245.

'Porcupine' Exp. 1870: Med. St. 50, Benzert Road, Adventure Bank. The specimen from Benzert Road is larger than others, and measures nearly a line and a half in length; the usual length is a line, or one tenth of an inch.

Distribution. Mediterranean and Adriatic, Canaries (*McAndrew*)!, Madeira (*Watson*)!; 30-120 fms.

✓ 4. *EULIMA POLITA*, Linné.

Turbo politus, L. S. N. p. 1241.

E. polita, B. C. iv. p. 201; v. p. 214, pl. lxxvii. f. 3.

'Porcupine' Exp. 1870: Med. St. 50, G. Tunis.

Distribution. Finmark to the Ægean; 2-145 fms.

Fossil. Miocene, Pliocene, and Post-tertiary: Norway southwards through Europe to Rhodes; 0-80 ft.

✓ 5. *EULIMA INTERMEDIA*, Cantraine.

E. intermedia, Cantr. Diagn. Moll. Bull. Ac. Brux. 1835, p. 14; B. C. iv. p. 203; v. p. 214, pl. lxxvii. f. 4.

'Porcupine' Exp. 1870: Atl. St. 27, 28, 28a; Med. 50.

Distribution. Hammerfest to the Adriatic and eastern part of the Mediterranean, Madeira and the Canaries (*McAndrew*)!, C. de Verd I. (*Rochebrune*), and New England (*Verrill*); 11-645 fms.

Fossil. Miocene: Vienna Basin!, N.W. Germany. Pliocene: Coralline and Red Crag, Biot, and Italy. Post-tertiary: Norway.

E. nitida of Philippi, but apparently not *Melania nitida* of Lamarck, from the Paris Basin.

Extremely variable in size, length of the spire, comparative slenderness, and breadth of the last whorl, as well as in a slight degree of curvature. Many species could easily be made out of it. In *E. polita* (especially the young) the periphery is angulated, but never in the present species.

Cantraine's description is too short to be satisfactory, viz.:—"Testa parva, subulata, recta, vitrea, levi. Alt. 5 lin. diam. $1\frac{1}{4}$."

✓ 6. *EULIMA DISTORTA*, Defrance.

Melania distorta (Defrance), Deshayes, Descr. d. Coq. foss. des environs de Paris (1824), t. ii. p. 111, pl. xiii. f. 24, 25.

E. distorta, B. C. iv. p. 205; v. p. 214, pl. lxxvii. f. 5.

'Porcupine' Exp. 1869: St. 9, 18 (and var. *gracilis*), 25 (and var. *gracilis*), N. Channel. 1870: Atl. 13, Vigo B., 29-34; Med. G. Tunis, Adventure Bank.

Distribution. Lofoten I. to the Adriatic and Archipelago, Madeira (*Watson*), Canaries (*d'Orbigny* and *McAndrew*). Off Sahara and west coast of Africa ('Talisman' Exp.), Azores (*Drouet*), New England (*Verrill*), St. Vincent's, West Indies (*Guilding*), Mazatlan (*P. Carpenter*), N. Japan (*St. John*)!; 0-1261 fms.

Fossil. Pliocene: Red Crag (*A. Bell*)!, Italy. Post-tertiary: Norway, Ayrshire, and Rhodes.

I regard as synonyms of this abundant and widely spread species, *Rissoa sinuosa*, Scacchi; *Turbo curvatus*, Chierighini (MS. only); *Balcis arcuata*, Leach (1852); and *E. philippii*, Weinkauff (1867).

Judging from the description and figure of the Eocene species in the above-cited work of Deshayes, I should have been inclined to consider it distinct from the recent species; but having lately received, through the kindness of Dr. Fischer, typical specimens of the former, I have carefully compared them with many hundred specimens of the latter, and I feel myself conscientiously bound to unite them. Some specimens of both forms have the last whorl larger in proportion to the next, or else have the outer lip more or less flexuous; the degree of curvature (which is occasionally double or flexuous) differs considerably, and the periphery is now and then somewhat angulated or keeled.

The variety *gracilis* is usually straight instead of being distorted or curved; but after a long and close examination, I have failed in discovering a single character which would justify its separation from the typical form as a distinct species. Both are equally common and generally distributed with intermediate forms.

Professor G. O. Sars found this species living in a quasi-parasitic or "commensal" state inside *Holothuria intestinalis*.

✓ 7. *EULIMA GLABRA*¹, Jeffreys. (Plate XXVIII. fig. 2.)

SHELL awl-shaped, rather strong, semitransparent, and of a polished lustre: *sculpture* none: *colour* whitish, with a faint tinge

¹ Smooth.

of brownish-yellow: *spire* shortish, ending in a blunt and bulbous point: *whorls* 8, somewhat convex; the first is inflected, and the last occupies about half the shell: *suture* nearly straight, well defined: *mouth* oval, proportionally large, acutangular above and rounded below; its length equals one third of the spire: *outer lip* flexuous: *inner lip* reflected on the pillar at its base, but not observable on its upper part. L. 0.15. B. 0.06.

'Porcupine' Exp. 1870: Atl. St. 9, 17. A single specimen from each station.

This is less slender than *E. distorta* or any of its varieties; the spire is shorter and quite straight, the apex is blunt and bulbous instead of finely pointed, and the mouth is proportionately larger.

Distribution. Off the coast of West Africa ('Talisman' Exp.); 1192 fms.

✓ 8. *EULIMA STALIOI*, Brusina. (Plate XXVIII. fig. 3.)

E. stalioi, Brus., J. de Conch. xvii. (1869), p. 242.

'Porcupine' Exp. 1870: Atl. St. 29, 30.

Distribution. Dalmatia (*Stalio* and *Brusina*), Algiers (coll. *Weinkauff*), off Marocco ('Talisman' Exp.)!, Madeira (*Watson*)!; 20-1192 fms.

Intermediate between *E. glabella* of Searles Wood from the Coralline Crag, and *E. brevis* of Requien from Corsica and the Adriatic. The present species may ultimately prove to be a variety of *E. brevis*. Professor Brusina having obligingly favoured me with a specimen of his *E. petitiana*, I believe it is a variety of *E. stalioi*; but I offer this opinion with great respect for his intimate knowledge of the Adriatic Mollusca.

✓ 9. *EULIMA SOLIDA*¹, Jeffreys. (Plate XXVIII. fig. 4.)

SHELL nearly cylindrical, slender, thick, transparent, and very glossy: *sculpture* none perceptible with a hand-lens or ordinary magnifying power; but under a compound microscope the whole surface of the shell appears to be covered with extremely fine and close-set longitudinal striæ or lines; the periphery is more or less distinctly keeled: *colour* glassy white: *spire* elongated, sometimes curved or distorted, and ending in a bulbous nucleus: *whorls* 8, compact and flattened; the first is inflected, and the last occupies rather more than two fifths of the shell: *suture* nearly straight, well defined, but narrow; it occasionally shows a rather broad line on the lower side by reason of the overlapping of each whorl: *mouth* oval, proportionally small, acutangular above and somewhat expanded below; its length is not a third of that of the spire: *outer lip* flexuous, in some specimens thickened: *inner lip* glazed and reflected on the pillar. L. 0.2. B. 0.05.

'Porcupine' Exp. 1869: St. 23 *a*. 1870: Atl. 9, 17, 19, 27, 28.

Distribution. Bay of Biscay ('Travailleur' Exp. 1880 and 1881), off Marocco, west coast of Africa, and the Azores ('Talisman' Exp.); 645-1622 fms.

¹ Compact.

Fossil. Pliocene: Messina (*Sequenza*).

Although this shell is thick and strong for its size, it is so transparent that the eyes of the animal are clearly seen through a living specimen. In this specimen the two uppermost whorls are quite empty, and the end of the liver appears in the succeeding whorl; it probably arose from shrinking of the animal before death.

✓ 10. *EULIMA FUSCO-APICATA*¹, Jeffreys. (Plate XXVIII. fig. 5.)

SHELL spike-shaped, slender, thin, transparent, and very glossy: *sculpture*, indistinct but exceedingly fine longitudinal lines, which are detected only by the microscope; the periphery is slightly keeled in some specimens: *colour* that of clear glass, except the 3 or 4 topmost whorls, which are chestnut-brown: *spire* long and finely tapering to a point: *whorls* 9-11, rather convex; the last occupies about half the shell: *suture* shallow, and somewhat oblique: *mouth* longish-oval, considerably expanding, acutangular above and obtusangular below; its length is nearly one third of that of the spire: *outer lip* remarkably flexuous and thin: *inner lip* adhering to the upper part of the pillar, and reflected a little on its lower part. L. 0.2. B. 0.075.

'Porcupine' Exp. 1870: Atl. St. 16, 17, 17 *a*. A fragment of this species indicates a larger size than that which is given in the description. The dark colour of the apical whorls is very peculiar and characteristic.

Distribution. Bay of Biscay ('Travailleur' Exp.). Off the west coast of Africa and Cape de Verd Isles; 681-1192 fms.

✓ 11. *EULIMA PIRIFORMIS*, Brugnone. (Plate XXVIII. fig. 6.)

E. piriformis, Brugn. Misc. Mal. 1873, p. 7. f. 5.

'Porcupine' Exp. 1870: Atl. St. 3 *a*, 6 (var. *bizonata*), 16, 17, 17 *a*. Med. Adventure Bank. Some of the specimens are more or less curved or twisted, like *E. distorta*. The variety *bizonata*, of which a single specimen occurred, has two narrow bands of reddish-brown (one below the suture, and the other encircling the periphery) on the last whorl, and two in corresponding positions on each of the other whorls. In some of the other specimens the apical whorls are coloured as in *E. fusco-apicata*; but the shape of the shell and the proportionate size of the last whorl are different. Possibly, however, both of these species may be one and the same.

Distribution. Bay of Biscay ('Travailleur' Exp. 1880 and 1881), Sicily (*Brugnone* and *Monterosato*), off west coast of Africa ('Talisman' Exp.), Culebra I. ('Challenger' Exp.); 11-1512 fms.

Fossil. Pliocene: Ficarazzi (*Brugnone*).

The figure given by the lamented author represented a fossil and not a good or characteristic specimen. I have therefore considered it advisable to figure a recent specimen.

The Rev. R. Boog Watson has described this species from the 'Challenger' Expedition as *E. chaunax*, and perhaps also as *E. hians*.

It may be distinguished from any of its congeners by the swollen

¹ Tipped with chestnut-brown.

shape of the last whorl, the remarkably flexuous character of the outer lip, and the pinched apex, which resembles that of *Stilifer*. The apex is more blunt than in *E. fusco-apicata*.

✓ 12. *EULIMA ABBREVIATA*¹, Jeffreys. (Plate XXVIII. fig. 7.)

SHELL conical, thin, semitransparent, and glossy: *sculpture*, microscopic, close-set, regular and very fine longitudinal striæ; periphery rounded and not keeled or angulated: *colour* ivory-white, except the three apical whorls, which are light brown: *spire* short, abruptly graduating to a rather blunt point: *whorls* 7, convex; the last occupies three fifths of the shell: *suture* distinct, nearly straight: *mouth* oval, curved below: *outer lip* flexuous, as in other species of this genus: *inner lip* thick, and spread over the lower part of the pillar. L. 0.15. B. 0.075.

'Porcupine' Exp. 1870: Atl. St. 17 *a*. Two specimens.

✓ 13. *EULIMA SUBUMBILICATA*², Jeffreys. (Plate XXVIII. fig. 8.)

SHELL forming a short cone, rather solid for its minute size, nearly opaque, and glossy: *sculpture* none; periphery obtusely angular: *colour* creamy white: *spire* extremely short and terminating in a blunt and bulbous point: *whorls* 5, compressed and rounded; the last occupies nearly two thirds of the shell: *suture* slight, straight: *mouth* roundish-oval, projecting beyond the line of the spire, contracted at the upper corner and rounded below: *outer lip* semicircular: *inner lip* filmy at the top and narrowly reflected on the bottom of the pillar: *umbilicus* shallow and exhibiting a small perforation behind the pillar. L. 0.05. B. 0.025.

'Porcupine' Exp. 1870: Atl. St. 27. A single specimen, but characteristic from not merely its minute size, but from its excessively short and compact spire, the shape of its mouth, and especially the umbilical perforation.

✓ 14. *EULIMA MINUTA*³, Jeffreys. (Plate XXVIII. fig. 9.)

SHELL club-shaped, thin, semitransparent, and glossy: *sculpture* none except microscopic and close-set longitudinal striæ or scratches; periphery rounded: *colour* whitish, with a slight tint of yellow: *spire* rather long; apex blunt: *whorls* 5-6, compressed; the last takes up about half the shell: *suture* slight and oblique: *mouth* oval, contracted and pointed above, curved below: *outer lip* somewhat thickened: *inner lip* also thickened, and somewhat expanding at the base, which slopes gradually. L. 0.075. B. 0.025.

'Porcupine' Exp. 1870: Atl. St. 26-29. Six specimens.

Distribution. Strait of Messina (*Granata-Grillo*), off Marocco ('Talisman' Exp.), 18-1192 fms.

✓ 15. *EULIMA OBTUSA*⁴, Jeffreys. (Plate XXVIII. fig. 10.)

SHELL somewhat cylindrical, slender, rather thick, semitransparent,

¹ Shortened.

² Somewhat umbilicated.

³ Minute.

⁴ Blunted.

and lustrous: *sculpture* none: *colour* whitish: *spire* long and gradually tapering to a blunt point; *whorls* 7, rounded; the last is equal in length and bulk to half the shell: *suture* very slight and scarcely separating or defining the whorls, nearly straight: *mouth* oblong-oval, rather narrow, sharply pointed above and curved below: *outer lip* thin and flexuous, not projecting or prominent: *inner lip* filmy on the upper part and adding to the pillar, thickened and reflected on the lower part of the pillar, which is gently sloping. L. 0.15. B. 0.05.

'Porcupine' Exp. 1870: Atl. St. 17a; Med. 55.

Distribution. Bay of Biscay ('Travailleur' Exp. 1881), off Malta (*Spratt*), off Sahara, C. de Verd Is., and Azores ('Talisman' Exp.); 310–2199 fms.

Has somewhat the size and appearance of *E. glabra*, but is more cylindrical, and differs particularly in the apex, which is blunt in the present species, thus connecting it with *E. stenostoma*. It is not the *E. obtusa* of De Folin ('Les Fonds de la Mer,' p. 211, pl. xxxviii. f. 11), which is apparently *E. stalioi*.

✓ 16. EULIMA STENOSTOMA, Jeffreys.

E. stenostoma, Jeffr. in Ann. & Mag. N. H. 3rd ser. ii. p. 128, pl. v. f. 7: B. C. iv. p. 207; v. p. 215, pl. lxxvii. f. 6.

'Porcupine' Exp. 1869: St. 3, 6, 61, 68, 69.

Distribution. Finmark and Lofoten Is., W. & S. Norway, Shetland, N. W. of Peterhead (*Metzger*), Bay of Biscay ('Travailleur' Exp., 1880 and 1881), between Iceland and Greenland ('Valorous' Exp.), G. St. Lawrence (*Whiteaves*); 40–1062 fms. Palermo (*Monterosato*)?

Fossil. Pliocene: Coralline Crag (*S. Wood*)?

Several names of other species both of the present genus and of *Odostomia* have been proposed by the Marquis de Monterosato in his catalogues; but as they were not sufficiently, if at all, described, nor any of them figured, I cannot identify them, and I fear the names must be treated as manuscript.

SUMMARY OF THE FOREGOING LIST.

Families.	Genera.	Number of Species.
XVI. ACLIDÆ	CIONISCUS	2
	ACLIS	4
	PHERUSA	1
XVII. PYRAMIDELLIDÆ	ODOSTOMIA	49
	PYRAMIDELLA	1
	MATHILDA	1
XVIII. EULIMIDÆ	GEGANIA	1
	EULIMA	16
		—
		Total 75

EXPLANATION OF THE PLATES.

PLATE XXVI.

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| Fig. 1. <i>Cioniscus gracilis</i> , p. 341. | Fig. 6. <i>Odostomia prælonga</i> , p. 350. |
| 2. — <i>striatus</i> , p. 342. | 7. — <i>crassa</i> , p. 350. |
| 3. <i>Odostomia suboblonga</i> , p. 345. | 8. — <i>unifasciata</i> , p. 351. |
| 4. — <i>tenuis</i> , p. 347. | 9. — <i>sigmoidea</i> , p. 354. |
| 5. — <i>nitens</i> , p. 349. | 10. — <i>flexuosa</i> , p. 355. |

PLATE XXVII.

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| Fig. 1. <i>Odostomia sinuosa</i> , p. 358. | Fig. 7. <i>Odostomia semicostata</i> , p. 361. |
| 2. — <i>acuticostata</i> , p. 359. | 8. <i>Pyramidella nitidula</i> , p. 363. |
| 3. — <i>fulgidula</i> , p. 359. | 9. <i>Mathilda quadricarinata</i> (apex),
p. 364. |
| 4. — <i>attenuata</i> , p. 360. | 10. <i>Gegania pinguis</i> , p. 365. |
| 5. — <i>compressa</i> , p. 360. | |
| 6. — <i>paucistriata</i> , p. 361. | |

PLATE XXVIII.

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| Fig. 1. <i>Eulima jeffreysiana</i> , p. 366. | Fig. 6. <i>Eulima piriformis</i> , p. 369. |
| 2. — <i>glabra</i> , p. 367. | 7. — <i>abbreviata</i> , p. 370. |
| 3. — <i>stalioides</i> , p. 368. | 8. — <i>subumbilicata</i> , p. 370. |
| 4. — <i>solida</i> , p. 368. | 9. — <i>minuta</i> , p. 370. |
| 5. — <i>fusco-apicata</i> , p. 369. | 10. — <i>obtusa</i> , p. 370. |

3. Studies in the Holothuroidea.—IV. On the Structural Characters of the Cotton-Spinner (*Holothuria nigra*), and especially of its Cuvierian Organs. By F. JEFFREY BELL, M.A., F.Z.S., Professor of Comparative Anatomy in King's College.

[Received May 15, 1884.]

Scattered through zoological literature there are here and there references to a Holothurian, of which Selenka appears to have had no knowledge, and which Semper places among the "gänzlich zweifelhaften Arten," but which, unless patriotism is a fault in a man of science, ought to be of interest to British naturalists in so far and inasmuch as it is not only the only known British representative of the restricted genus *Holothuria*, but it is, so far as we know at present, the only member of the family of Aspidochirotae, or Holothurians with shield-shaped tentacles and no retractors for the pharynx, that is found in our seas. Discovered shortly after the publication of Forbes's 'British Starfishes'—which, like every other work from that accomplished pen, had a remarkable influence on his contemporaries—it was first mentioned and described to a scientific audience by Mr. C. W. Peach in 1844, who appears (see Report, 1844, p. 65) to have satisfied the members of the British Association that, in introducing to them the "nigger or cotton-spinner," he was speaking of a Holothurian new to the British fauna. A communication on this animal was read by Mr. Peach to the Royal Polytechnic Institution of Cornwall, and is to be found, with an illustrative plate, on pp. 171–174 of the 'Annals and Magazine



Jeffreys, John Gwyn. 1884. "On the Mollusca procured during the 'Lightning' and 'Porcupine' Expeditions, 1868-70. (Part VIII.1)." *Proceedings of the Zoological Society of London* 1884, 341–372.

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