LIST OF ECHINODERMATA DREDGED BY THE "FISH HAWK", 1880 TO 1882, NOT OBTAINED BY THE "ALBATROSS" IN 1883.

Toxodora ferruginea Verrill. 1882.
B. range, 100 to 155 fathoms, 1880, 1881. Locally common.

Spatangus purpureus Leske.
B. range, 89 to 158 fathoms, 1881, 1882. Not common.

Echinocyamus pusillus (Müller) Gray.
B. range, 146 fathoms, 1881. One specimen only.

Echinus Wallisi A. Agassiz.
B. range, 156 to 640 fathoms, 1880, 1881, 1882. Not common.

Temnechinus maculatus A. Agassiz.
B. range, 115 fathoms, 1880. One specimen only.

Dorocidaris papillata A. Agassiz (variety).
B. range, 104 to 158 fathoms, 1881, 1882. Locally common.

Hemipedina Cubensis A. Agassiz.
B. range, 194 fathoms, 1882. One specimen.

Poraniomorpha borealis Verrill. Figs. 46, 46*a*.
Asterina borealis Verrill, Amer. Journ. Sci., vol. xvi, p. 213, 1878.
B. range, 192 to 225 fathoms, 1880. Rare; northern.

Archaster Bairdii Verrill. 1882.
B. range, 351 to 396 fathoms, 1881. Rare.

Ctenodiscus crispatus Düben & Koren.
B. range, 182 to 321 fathoms, 1880, 1881, 1882. Local; abundant north of Cape Cod.

Ophioglypha (Ophiopleura) aurantiaca Verrill. 1882.
B. range, 86 to 317 fathoms, 1880, 1881, 1882. Rare.

Rhizocrinus Lofotensis Sars. Fig. 57, young.
B. range, 640 fathoms, 1882. Station 2226 in 2,021 fathoms, 1884.

ADDITIONAL DEEP-WATER ECHINODERMATA DREDGED BY THE "ALBATROSS" IN 1884.

Ankeroderma limicola Verrill. 1885.
Station 2171, in 444 fathoms, off Chesapeake Bay.

Aspidodiadema Antillarum A. Agassiz.
Station 2210, in 991 fathoms. Rare. West Indian.

Zoroaster fulgens W. Thomson.
Station 2206, in 1,043 fathoms. One example. European.

Pteraster pulvillus Sars.
Station 2226, off Chesapeake Bay, in 2,021 fathoms, 1884. Gulf of Maine and off Nova Scotia. Rare.

Astroporpa annulata Lütk. and Œrsted.
Off Cape Hatteras, stations 2267 to 2269, and 2301, in 48 to 68 fathoms, on *Titanideum suberosum* V. West Indian.

Bathycrinus, sp., near *B. gracilis* W. Thomson.
B. range, 2,021 fathoms, station 2226. One specimen.

LIST OF DECAPOD CRUSTACEA TAKEN BY THE "ALBATROSS" IN 1883.

The following list has been compiled from the papers published by Prof. S. I. Smith.* The Cumacea, Amphipoda, Isopoda, and lower groups, obtained in 1883, are not here included, for they have not yet been reported upon, though a few are mentioned on a previous page.

BRACHYURA.

Anamathia Agassizii Smith. 1885.
Amathia Agassizii Smith, 1882.
B. range, 142 to 333 fathoms (142 to 197 fathoms, 1883).

Hyas coarctatus Leach.
B. range, 35 to 906 fathoms, 1883. Chiefly northern.

Collodes robustus Smith. 1883.
B. range, 56 to 373 fathoms (78 to 373 fathoms, 1883).

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*The following papers by Professor Smith are the principal ones relating to the deep-water Crustacea of this region:

Preliminary Notice of the Crustacea dredged in 64 to 325 fathoms, off the south coast of New England by the United States Fish Commission in 1880. From the Proceedings of the National Museum, Washington, vol. iii, for 1880, January, 1881.

Preliminary Report on the Brachyura and Anomura dredged in deep water off the south coast of New England by the United States Fish Commission in 1880, 1881, and 1882. From the same, vol. vi, p. 1, June, 1883.

Report on the Crustacea. Part I. Decapoda ["Blake" expedition]. From the Bulletin Mus. Comp. Zoology, x, 1882.

Report on the Decapod Crustacea of the "Albatross" dredgings off the east coast of the United States in 1883. Extracted from the annual report of the Commissioner of Fish and Fisheries for 1882. Published 1884.

Crustacea of the "Albatross" dredgings in 1883. From the American Journal of Science, vol. xxviii, July, 1884.

On some new or little known Decapod Crustaceas from recent Fish Commission dredgings, off the east coast of the United States. From the Proceedings of the National Museum, vii, p. 493, 1885.

The following papers contain descriptions of the deep-water Isopoda:

Report on the Isopoda ["Blake" expedition]. From the Bulletin of the Museum of Comparative Zoology, vol. xi, No. 4, September, 1883. By Oscar Harger.

Report on the Marine Isopoda of New England and adjacent waters. This report, part vi, for 1878, p. 297. By Oscar Harger.

The following paper, relating to the "Blake" Crustacea, contains descriptions of species also dredged by the United States Fish Commission:

Études préliminaires sur les Crustacés. From the Bulletin of the Museum of Comparative Zoology, vol. viii, No. 1, December, 1880. By A. Milne-Edwards.

Euprognatha rastellifera Stimpson.
B. range 44 to 229 fathoms (66 to 98 fathoms, 1883). Very abundant locally, 1880, 1881.

Cancer irroratus Say.
B. range, shore to 314 fathoms (18 to 86 fathoms, 1883). Extends to the region south of Cape Hatteras in moderate depth.

Cancer borealis Stimpson.
B. range, shore to 435 fathoms (18 to 373 fathoms, 1883). Found as far south as Cape Hatteras, off the coast.

Geryon quinquedens Smith. 1879. Fig. 156.
B. range, 105 to 740 fathoms (105 to 588 fathoms, 1883); 263 to 740 fathoms, "Blake" expedition.

Achelous Gibbesii Stimpson.
B. range, 16 fathoms, 1883; off Cape Hatteras.

Persephone punctata (Brown) Stimpson.
B. range, 14 fathoms, 1883; off Cape Hatteras.

Ethusina abyssicola Smith. 1884.
B. range, 1,497 to 1,735 fathoms, 1883.

ANOMURA.

Latreillia elegans Roux.
B. range, 70 to 134 fathoms (70 fathoms, 1883).

Homola barbata (Fabricius) White.
B. range, 56 to 373 fathoms (143 to 373 fathoms, 1883).

Porcellana Sayana (Leach) White.
B. range, 48 fathoms, 1883; off Cape Hatteras.

Lithodes maia Leach.
B. range, 141 to 291 fathoms (141 fathoms, 1883; off Nova Scotia).

Lithodes Agassizii Smith. 1882. Figs. 151, 151*a*, 151*b*.
B. range, 410 to 1,255 fathoms (843 to 1,255 fathoms, 1883).

Eupagurus bernhardus (Linné) Brandt.
B. range, 5 to 86 fathoms, 1883.

Eupagurus politus Smith. 1882.
B. range, 31 to 640 fathoms, 1883.

Eupagurus pubescens (Kröyer) Brandt.
B. range, 26 to 86 fathoms (31 to 86 fathoms, 1883).

Eupagurus Kröyeri Stimpson.
B. range, 35 to 640 fathoms (35 to 239 fathoms, 1883).

Eupagurus longicarpus (Say) Stimpson.
B. range, shore to 20 fathoms (19 fathoms, 1883).

Eupagurus pollicaris (Say) Stimpson.
B. range, 1 to 20 fathoms (18 to 19 fathoms, 1883).

Catapagurus Sharreri A. M. Edwards. Fig. 26.
Hemipagurus socialis Smith. 1881.
B. range, 51 to 264 fathoms (78 to 140 fathoms, 1883).

Parapagurus pilosimanus Smith. 1879. Fig. 28.
B. range, 250 to 2,221 fathoms (1,731 to 2,221 fathoms, 1883).

Sympagurus pictus Smith. 1883. Fig. 161.
B. range, 164 to 264 fathoms (168 fathoms, 1883).

Munida Caribœa Smith. 1882. (Stimpson?) Fig. 153.
B. range, 56 to 264 fathoms (69 to 131 fathoms, 1883). Very abundant locally in 1880, 1881.

Munidopsis rostrata Smith. 1885.
Galacantha rostrata A. M.-Edwards.
B. range, 1,098 to 1,342 fathoms, 1883; 1,241 to 1,394 fathoms, "Blake" expedition.

Munidopsis Bairdii Smith. 1885.
Galacantha Bairdii Smith. 1884.
B. range, 1,497 fathoms, 1883.

Munidopsis curvirostra Whiteaves.
B. range, 75 to 1,290 fathoms. 1883.

MACRURA.

Pentacheles sculptus Smith. 1880. Fig. 152.
B. range, 464 to 843 fathoms (843 fathoms, 1883).

Pentacheles nanus Smith. 1884.
B. range, 843 to 1,917 fathoms, 1883.

Pentacheles debilis Smith. 1884.
B. range, 1,290 to 1,309 fathoms, 1883.

Ceraphilus Agassizii Smith. 1882. Fig. 155.
B. range, 499 to 959 fathoms, 1883; 263 to 603 fathoms, "Blake" expedition.

Crangon vulgaris Fabricius.
B. range, shore to 20 fathoms (18 to 19 fathoms, 1883).

Pontophilus Norvegicus M. Sars.
B. range, 105 to 524 fathoms (105 to 239 fathoms, 1883).

Pontophilus brevirostris Smith. 1881.
B. range, 51 to 233 fathoms (65 to 98 fathoms, 1883).

Pontophilus abyssi Smith. 1884.
B. range, 1,917 to 2,221 fathoms, 1883.

Sabinea princeps Smith. 1882. Fig. 157.
B. range, 372 to 888 fathoms (640 to 888 fathoms, 1883).

Sabinea Sarsii Smith. 1879.
B. range, 122 to 150 fathoms, 1883; off Nova Scotia.

Glyphocrangon sculptus Smith. 1884. Fig. 154.

Rhachocaris sculpta Smith, "Blake" expedition, Crust., p. 49, pl. 5, fig. 3, pl. 6, fig. 3-3d, 1882.

B. range, 1,098 to 1,395 fathoms, 1883.

Hippolyte Liljeborgii Danielssen.

B. range, 75 to 524 fathoms (75 to 150 fathoms, 1883).

Hippolyte pusiola Kröyer.

B. range, 49 fathoms, 1883; off Nova Scotia.

Hippolyte polaris Ross.

B. range, 122 fathoms, 1883; off Nova Scotia.

Hippolyte Grœnlandica (Fabricius) Miers.

B. range, 35 fathoms, 1883; George's Bank.

Bythocaris gracilis Smith. 1885.

B. range, 888 to 1,043 fathoms, 1883, 1884.

Pandalus Montagui Leach.

B. range, 113 fathoms, 1883; off Nova Scotia.

Pandalus propinquus G. O. Sars.

B. range, 122 to 524 fathoms (122 to 239 fathoms, 1883).

Pandalus borealis Kröyer.

B. range, 105 fathoms, 1883; off George's Bank.

Pandalus leptocerus Smith. 1881.

B. range, 10 to 430 fathoms (18 to 197 fathoms, 1883).

Nematocarcinus ensiferus Smith. 1884.

Eumiersia ensifera Smith, "Blake" expedition, Crust., p. 77, pl. 13, figs. 1-9, 1882.

B. range, 588 to 2,033 fathoms, 1883.

Ephyrina Benedicti Smith. 1885.

B. range, 959 fathoms, 1883.

Acanthephyra Agassizii Smith. 1882.

Miersia Agassizii Smith, 1882.

B. range, 105 to 2,949 fathoms, 1883.

Acanthephyra eximea Smith. 1884.

B. range, 938 fathoms, 1883; off Cape Hatteras.

Acanthephyra brevirostris Smith. 1885.

B. range, 1,395 to 2,949 fathoms, 1883.

Notostomus robustus Smith. 1884. Fig. 160.

B. range, 1,309 to 1,555 fathoms, 1883.

Meningodora mollis Smith. 1882.

B. range, 1,106 fathoms, 1883; 1,632 fathoms, "Blake" expedition.

Hymenodora glacialis G. O. Sars.

B. range, 861 to 2,949 fathoms, 1883, 1884.

Pasiphaë princeps Smith. 1884. Fig. 158.

B. range, 1,342 fathoms, 1883.

Parapasiphaë sulcatifrons Smith. 1884. Fig. 162.
B. range, 516 to 2,949 fathoms, 1883.

Parapasiphaë cristata Smith. 1884.
B. range, 1,628 fathoms, 1883.

Parapasiphaë compta Smith. 1884.
B. range, 2,369 fathoms, 1883.

Benthœcetes Bartletti Smith. 1882.
Benthesicymus Bartletti Smith, "Blake" expedition, Crust., p. 82, pl. 14, figs. 1–7, 1882.
B. range, 588 to 858 fathoms, 1883.

Benthesicymus? carinatus Smith. 1884.
B. range, 1,022 fathoms, 1883.

Benthesicymus?, sp. indet.
B. range, 1,555 fathoms, 1883.

Amalopenæus elegans Smith. 1882.
B. range, 372 to 2,369 fathoms (640 to 2,369 fathoms, 1883); 457 to 1,632 fathoms, "Blake" expedition.

Amalopenæus valens Smith. 1884.
B. range, 640 fathoms, 1883.

Aristeus? tridens Smith. 1884. Fig. 159.
B. range, 843 to 2,221 fathoms, 1883.

Hepomadus tener Smith. 1884.
B. range, 2,949 fathoms, 1883.

Hymenopenæus microps Smith. 1884.
B. range, 906 to 1,731 fathoms, 1883.

Sergestes arcticus Kröyer.
B. range, 139 to 1,025 fathoms (221 to 1,025 fathoms, 1883).

Sergestes robustus Smith. 1881.
B. range, 372 to 1,632 fathoms (640 to 641 fathoms, 1883); 1,632 fathoms, "Blake" expedition.

Sergestes mollis Smith. 1882.
B. range, 373 to 2,949 fathoms, 1883; 1,632 fathoms, "Blake" expedition.

SCHIZOPODA.

Gnathophausia, sp.
B. range, 858 to 2,033 fathoms, 1883.

Gnathophausia, sp.
B. range, 959 to 2,949 fathoms, 1883.

Thysanoessa, sp.
B. range, 398 to 1,067 fathoms.

Lophogaster, sp.
B. range, 1,022 to 2,949 fathoms, 1883.

Thysanopoda Norvegica Kröyer.

B. range, 35 to 252 fathoms (?); found in trawl-wings from various depths; 150 to 239 fathoms, 1883. Common at the surface, northward.

Boreomysis tridens G. O. Sars.

B. range, 351 to 500 fathoms, 1880, 1882, 1883. Common in the trawl-wings.

LIST OF ADDITIONAL DEEP-WATER CRUSTACEA DREDGED BY THE "FISH HAWK" AND "BLAKE," 1880–'82.

The following species, previously dredged in this region, have not yet been recorded as taken in 1883, but many of the Amphipods and Isopods, as well as additional species, are known to be among the collections of 1883, not yet carefully examined.

BRACHYURA.

Anamathia Tanneri Smith. 1885.

Amathia Tanneri Smith, Proc. Nat. Mus., vi, p. 3, 1883.

B. range, 130 to 146 fathoms, 1881.

Lispognathus furcatus A. M.-Edwards.

B. range, 317 to 225 fathoms, 1881, 1882.

Lambrus Verrillii Smith. 1881.

B. range, 65 to 134 fathoms, 1880, 1881.

Bathynectes longispina Stimpson.

B. range, 85 to 225 fathoms, 1881, 1882.

Acanthocarpus Alexandri Stimpson.

B. range, 50 to 200 fathoms, 1880, 1881. Common in 1880.

Myropsis quinquespinosa Stimpson.

B. range, 79 fathoms, 1881. One specimen.

Cymopolia gracilis Smith. 1883.

B. range, 142 fathoms, 1880. One specimen.

Ethusa microphthalma Smith. 1881.

B. range, 67 to 156 fathoms, 1880, 1881.

ANOMURA.

Lyreidus Bairdii Smith. 1881.

B. range, 100 to 120 fathoms, 1880. Two specimens.

Porcellana Sigsbeiana A. M.-Edwards.

B. range, 134 fathoms, 1881. One specimen.

Catapagurus gracilis Smith. 1882.

Hemipagurus gracilis Smith, Proc. Nat. Mus., iii, p. 426, 1881.

B. range, 53 to 155 fathoms. Common in 1880 and 1881.

Munida valida Smith. 1883.
B. range, 245 to 640 fathoms, 1882. Two specimens.

Eumunida picta Smith. 1883.
B. range, 115 to 158 fathoms, 1881, 1882.

Anoplonotus politus Smith. 1883.
B. range, 79 to 134 fathoms, 1880, 1881.

MACRURA.

Arctus depressus Smith. 1881.
B. range, 86 fathoms, 1880. Rare.

Nephropsis aculeatus Smith. 1881.
B. range, 100 to 126 fathoms, 1880. Rare.

Axius armatus Smith. 1881.
B. range, 100 to 142 fathoms, 1880. Rare.

Hippolyte Phippsii Kröyer.
B. range, 73 fathoms, near George's Bank, "Blake" expedition. Not uncommon northward in shallow water.

Caridion Gordoni Goës.
B. range, 143 fathoms, "Blake" expedition. Northern.

Bythocaris nana Smith, 1885.
B. range, 65 to 142 fathoms, 1880; 178 fathoms, "Blake" expedition, 1880.

Pandalus tenuipes Smith. 1881.
B. range, 100 to 252 fathoms, 1880.

Penæus politus Smith. 1881.
B. range, 142 fathoms, 1880. One specimen.

SCHIZOPODA.

Pseudomma roseum G. O. Sars.
B. range, 500 fathoms, 1880.

Lophogaster, sp.
B. range, 155 fathoms, 1880.

CUMACEA.

Diastylis quadrispinosus G. O. Sars.
B. range, 100 to 142 fathoms, 1880. Additional species have also been taken.

STOMATOPODA.

Lysiosquilla armata Smith. 1881.
B. range, 65 to 120 fathoms, 1880, 1882.

AMPHIPODA.

The following list is very incomplete. Many additional species have been taken which have not yet been reported upon:

Stegocephalus ampulla Bell.
B. range, 168 to 264 fathoms, 1880, 1881, 1882.

Epimeria loricata G. O. Sars.
B. range, 90 to 640 fathoms, 1880, 1881, 1882.

Haploops setosa Boeck.
B. range, 252 fathoms, 1880.

Ptilocheirus pinguis Stimpson.
B. range, 45 to 86 fathoms, 1880, 1881.

Erichthonius difformis M.-Edw.
B. range, 192 fathoms, 1880, 1881.

Unciola irrorata Say.
B. range, 1 to 192 fathoms, 1880, 1881, 1882, 1883.

Themisto bispinosa Boeck.
B. range, 44 to 110 fathoms. Perhaps also from the surface.

Neohela phasma Smith. 1881.
B. range, 349 to 374 fathoms, 1880, 1882.

Caprella, sp.
B. range, 843 to 1,080 fathoms, 1883, 1884.

ISOPODA.

The following list is very incomplete, for the Isopods collected since 1881 have been but little examined.

Many of the following were also taken in 1883. Several species described by Mr. Harger from the "Blake" expedition, dredged south of Cape Hatteras, are not included in this list.

Janira alta (Stimp.) Harger.
B. range, 65 to 487 fathoms, 1880, 1882.

Munnopsis typica Sars.
B. range, 125 to 142 fathoms, 1880, 1881.

Astacilla granulata (Sars) Harger. Fig. 166.
B. range, 291 to 640 fathoms, 1882.

Cirolana polita Harger.
B. range, 89 to 321 fathoms, 1880, 1882.

Cirolana impressa Harger. 1883. Fig. 165.
B. range, 100 to 321 fathoms, 1880, 1881.

Æga psora (L.) Kröyer.
B. range, 306 to 640 fathoms, 1880, 1882.

Rocinela Americana (Sch. & Mein.)
B. range, 85 to 157 fathoms, 1880, 1882; 257 fathoms, "Blake" expedition.

Rocinela, sp.
B. range, 129 fathoms, "Blake" expedition.

Syscenus infelix Harger. Fig. 164.
B. range, 182 to 640 fathoms, 1880, 1881, 1882.

Phryxus abdominalis Köyer.
B. range, 97 to 351 fathoms, on *Pandalus leptocerus*.

Anthura, sp.
B. range, 349 fathoms, 1882.

Gnathia cerina (Stimp.) Harger.
B. range, 65 to 487 fathoms, 1880.

Tanais, sp.
B. range, station 1146, 1881.

LIST OF DEEP-WATER PYCNOGONIDA.

The following list includes the Pycnogonids that have been recorded from the region under discussion, obtained by the "Blake"* and "Fish Hawk." It is very incomplete, for those collected in 1881, 1882, and 1883 have not been fully studied, although many interesting species were obtained. Several of the following species recorded as having been obtained in 1883 and 1884 were identified by Prof. S. I. Smith. Others, not here recorded, are known to have been taken in 1883.

Pycnogonum littorale Ström.
B. range, 73 to 810 fathoms. Common northward from low-water mark to 100 fathoms.

Colossendeis angusta Sars.
B. range, 810 to 1,242 fathoms, "Blake."

Colossendeis colossea Wilson. Fig. 169.
B. range, 500 to 1,500 fathoms; 499 to 1,106 fathoms, 1883; 924 to 1,230 fathoms, 1884.

Colossendeis macerrima Wilson. Fig. 170.
B. range, 317 to 1,073 fathoms; 922 fathoms, "Blake" expedition; 317 fathoms, 1882; 1,073 fathoms, 1884.

Colossendeis gracilis Hoeck.
B. range, 924 to 1,600 fathoms, 1884. (Identified by S. I. Smith.)

Scœorhynchus armatus Wilson. Figs. 171, 171*a*.
B. range, 1,242 fathoms, "Blake" expedition; 1,073 fathoms, 1884.

* For the "Blake" collection, see report on the Pycnogonida, by E. B. Wilson, Bulletin Mus. Comp. Zoology, viii, No. 12, five plates, 1881.

Pallenopsis longirostris Wilson.

B. range, 500 fathoms, 1880

Nymphon grossipes (L.) Fabr.

B. range, 150 to 524 fathoms. Common northward in 12 to 110 fathoms.

Nymphon Strömii Kröyer.

B. range, 234 to 780 fathoms; 260 to 524 fathoms, "Blake;" 234 to 780 fathoms, 1882.

Nymphon pallenoides Sars.

B. range, 922 fathoms, "Blake" expedition.

LIST OF DEEP-SEA AND SURFACE MOLLUSCA COLLECTED BY THE "ALBATROSS" IN 1883.

In the following list the shallow-water Mollusca dredged off Nova Scotia and Cape Hatteras are not included,* but the pelagic species belonging to the Pteropoda and Heteropoda, &c., are introduced, partly as a matter of convenience and partly because their dead shells are constantly dredged up from the bottom at all depths.

In addition to the following list of Mollusca, a large number of species were dredged in the same region by the "Fish Hawk" in 1880 to 1882, which are here omitted. They have been already enumerated by Miss K. J. Bush, in her list of the Mollusca of the "Fish Hawk" dredgings (this report, vol. xi, p. 701) and in my Second Catalogue of Mollusca. About forty species not contained in either of the lists were dredged in the same region by the "Albatross" in 1884. Of these about twenty-five were undescribed.

The nomenclature of this list is, with the exception of a few necessary changes, essentially the same as that used in my "Second Catalogue of of Mollusca," in the Transactions of the Connecticut Academy, vol. vi, 1884, where the synonymy is briefly given. The references in the following list are to that paper and the preceding one, in volume v of the Transactions. A large part of the new forms were described and figured in those two papers.†

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* For the Hatteras shells, see special list by Miss K. J. Bush, p. 77.

† Catalogue of Marine Mollusca added to the Fauna of New England during the past ten years, from the Transactions of the Connecticut Academy, vol. v., Part II, 1882. Five plates.

Second Catalogue of Mollusca, recently added to the Fauna of the New England coast and the adjacent parts of the Atlantic, consisting mostly of deep-sea species, with notes on others previously recorded. From the Transactions of the Connecticut Academy, vol. vi, Part I, 1884. Five plates.

Third Catalogue of Mollusca. From the same, vol. vi, Part II, 1885. Three plates.

Descriptions and lists of many of these Mollusca are also contained in the following papers, by the writer:

Notice of recent additions to the marine Invertebrata of the northeastern coast of

As it is always important, in giving the bathymetrical distribution of shells to distinguish between those taken alive and those of which only dead shells are obtained (which may have been carried by fishes, crabs, and various other agencies far from their true habitats), an asterisk (*) is added to designate living specimens, while a dagger (†) indicates dead shells. When no sign is added, it is to be understood that the specimens were living. The "Bathymetrical range" here refers only to the range as actually observed in this region by the United States Fish Commission, unless otherwise stated.

The geographical distribution is indicated, in a general way, by the abbreviations following the range in depth, but I have not attempted to make it complete in this respect. Owing to the uncertainty as to the alleged identity of the species recorded from other regions with our own, and to the incompleteness of the published lists of species collected by the various other recent dredging expeditions, the knowledge of the foreign distribution of many of these species is still very imperfect, and is sure to be largely increased within a few years, so that any facts of this kind that can now be given will have, at best, only a temporary value. The abbreviations are as follows: N., = northern, indicates that the species ranges northward along the American coast, beyond New England waters; S., = southern, southward beyond Cape Hatteras; Arc, = Arctic; Eu., = European; Med., = Mediterranean; Af., = West African; P., = North Pacific; As., = North Asia; Cb., = Caribbean Sea and West Indies; Oc., = Oceanic or pelagic.

America, with descriptions of new genera and species and critical remarks on others. Proceedings of the United States National Museum, vol. iii, December, 1880, and January, 1881.

Part II, Mollusca, with notes on Annelida, Echinodermata, &c., collected by the United States Fish Commission [pp. 356–405], December, 1880, and January, 1881.

Part III, Catalogue of Mollusca, recently added to the Fauna of Southern New England [pp. 405–409], by A. E. Verrill.

Part IV, in vol. v [pp. 315 to 343], 1882, Additions to the deep-water Mollusca, taken off Martha's Vineyard, in 1880 and 1881.

The Cephalopods of the northeastern coast of America. Part II, The smaller Cephalopods, including the "Squids" and Octopi, with other allied forms. Trans. Conn. Acad., v [pp. 259–424, pls. 26–56], June, 1880, to October, 1881.

Report on the Cephalopods [of the "Blake" expedition, 1880], and on some additional species dredged by the United States Fish Commission steamer "Fish Hawk," during the season of 1880. Bulletin Mus. Comp. Zool., vol. viii [pp. 99–116, 8 plates], March, 1881.

Supplement report on the "Blake" Cephalopods, vol. xi, pp. 105-115, plates i, ii, iii, 1883.

Report on the Cephalopods of the northeastern coast of America. This report, Part VII, for 1879 [244 pages, 46 plates], 1882.

See also Brief Contributions to Zoology, Nos. 40 to 56, in American Journal of Science, 1877 to 1884.

CEPHALOPODA.

Lestoteuthis Fabricii (Licht.) Verrill. Trans. Conn. Acad., v, 291, 390, pl. 45, f. 1–2*d*; pl. 46, f. 1–1*f*; pl. 55, f. 1–1*d*.
Bathymetrical range, 255 to 906 fathoms. N., Arc., P.

Ommastrephes illecebrosus (Les.) V. v, 268, pls. 28, 29, 37, 38, 39.
B. range, 0 to 1,022 f.; beaks 1,091 to 1,917 f. N.

Sthenoteuthis Bartramii V. v, 288.
Surface.* Southern. Oc.

Mastigoteuthis Agassizii V. v, 297, pl. 48; pl. 49, f. 2, 3–3*g*; vi, 243.
B. range, 640 to 1,050 f.

Cheiroteuthis lacertosa V. v, 299, 408, pl. 47, f. 1–1*b*; pl. 56, f. 1–1*f*; vi, 243.
B. range, 435 to 2,221 f. (2,949, arms). N.

Leptoteuthis diaphana V. vi, 141, pl. 32, f. 1. Fig. 62.
B. range, 1,731 f.

Brachioteuthis Beanii V. v, 406, pl. 55, f. 3–3*b*; pl. 56, f. 2–2*a*; vi, 245.
B. range, 183 to 843 f.

Calliteuthis reversa V. v, 295, pl. 46, f. 1–1*b*; vi, 243.
B. range, 365 to 2,369 f.

Desmoteuthis hyperborea (Steenst.) V. v, 302, pl. 27, f. 1–2; pl. 39, f. 1.
B. range, 641 f., off Chesapeake Bay. N., Arc.

Desmoteuthis tenera V. v, 412, pl. 55, f. 2–2*d*; pl. 56, f. 3; vi, 245.
B. range, 396 to 1,346 f.

Rossia sublevis V. v, 354, 419, pl. 30, f. 2; pl. 31, f. 3; pl. 46, f. 4; pl. 47, f. 2–4.
B. range, 115 to 640 f. N.

Heteroteuthis tenera V. v, 357, 419, pl. 46, f. 2–2*d*, 3–3*b*; pl. 47, f. 5–5*b*.
B. range, 18 to 301 f., eggs 317 f.

Argonauta argo Linné. v, 364, 420; vi, 247, pl. 28, f. 1–1*b*. Figs. 63, 63*a*, 63*b*.
B. range, shells, 64 to 1,917 f.; living at surface. Oc., Cb., S., Med.

Alloposus mollis V. v, 366, 420, pl. 50, f. 1–2*a*; pl. 51, f. 4; vi, 247.
B. range, 238 to 1,346 f.; frag. 1,735 f.

Octopus Bairdii V. v, 368, 421, pl. 33, f. 1, 1*a*; pl. 34, f. 5, 6; pl. 36, f. 10; pl. 38, f. 8; pl. 49, f. 4, 4*a*; pl. 51, f. 1, 1*a*.
B. range, 85 to 843 f.; 28 to 300 f. N. of Cape Cod. N., Eur.

Octopus piscatorum V. v, 377, pl. 36, f. 1, 2; vi, 248.
B. range, 1,362 f. Northern.

Octopus Carolinensis V. vi, 235.
B. range, 142 f., off Cape Hatteras.

Octopus gracilis V. vi, 236.
B. range, 1290 f.

Eledone verrucosa V. v, 380, pls. 52, 53; vi, 248.
B. range, 787 to 1,255 f.

Eledonella pygmæa V. vi, 145, pl. 32, f. 2. Fig. 64.
B. range, 2,949 f., off Chesapeake Bay.

Stauroteuthis syrtensis V. (?) v, 382, pl. 32, f. 1–5; vi, 249.
B. range, 1,346 f., station 2034, off Nova Scotia. N.

GASTROPODA.

TOXOGLOSSA.

Admete Couthouyi Jay (=*A. viridula* Gld.)
B. range, 155 to 1,255 f. N., Arc., Eu.

Pleurotoma Dalli V. and S. v, 451, pl. 57, f. 1–1*a*. Figs. 66, 66*a*.
B. range, 94 to 142 f.*; 146 f.†

Pleurotomella Agassizii V. and S. v, 454, pl. 57, f. 3, 3*a*. Fig. 67.
B. range, 39 to 1,309 f.*; 1,608 f.†

Pleurotomella Bairdii V. and S. vi, 147, pl. 31, f. 1. Fig. 68.
B. range, 1,608 to 1,731 f.*; 2,221 f.†

Pleurotomella Benedicti V. and S. vi, 148, pl. 31, f. 2, 2*a*. Fig. 70.
B. range, 1,290 f.

Pleurotomella Sandersoni V. vi, 149, pl. 31, f. 3, 3*a*. Fig. 71.
B. range, 1,290 to 2,033 f.

Pleurotomella Saffordi V. and S. vi, 151, pl. 31, f. 4, 4*a*. Fig. 72.
B. range, 843 to 1,608 f.

Pleurotomella bandella Dall=*P. Diomedeæ* V. vi, 152, 250, pl. 31, f. 5–5*a*. Fig. 73.
B. range, 1,290 to 2,033 f. Cb.

Pleurotomella Emertoni V. and S. vi, 154, pl. 31, f. 6. Fig. 74.
B. range, 1,917 f.† Off Chesapeake Bay. Cb.

Pleurotomella Bruneri V. and S. vi, 155, pl. 31, f. 7, 7*a*. Fig. 75.
B. range, 1,608 f.*; 2,033 f.†

Pleurotomella Catharinæ V. and S. vi, 155, pl. 31, f. 9, 9*a*. Figs. 76, 76*a*.
B. range, 843 to 2,033 f.

Gymnobela engonia V. vi, 157.
B. range, 906 to 1,451 f.†; 1,608 f.*

Gymnobela curta V. vi, 158, pl. 31, f. 10.
B. range, 843 to 1,290 f.*; 1,467 to 1,917 f.†

Gymnobela curta, var. *subangulata* V. vi, 159.
B. range, 197 to 2,033 f.†; 1,290 to 1,451 f.*

Gymnobela brevis Verrill. 1885.
B. range, 1,290 to 1,608 f.

Gymnobela hebes V. v, 459, pl. 57, f. 7.
B. range, 252 to 906 f.*; 1,290 to 2,033 f.†

Bela ovalis Friele=*Bela pygmæa* V. v, 460, pl. 57, f. 8.
B. range, 312 to 906 f.*; 1,091 f.† N., Eu., Arc.

Bela tenuicostata Sars.
B. range, 843 to 1,290 f. Eu.

Bela cancellata (Mighels) Stimpson. v, 475, pl. 43, f. 10, 11; pl. 57, f. 13.
B. range, 126 to 547 f.† N., Arc., Eu.

Bela subvitrea V. vi, 160.
B. range, 843 f. Off Cape Hatteras.

Bela subturgida V. vi, 161.
B. range, 843 f. Off Cape Hatteras.

Bela Rathbuni V. vi, 236.
B. range, 1,395 f.† Off Cape Hatteras.

Spirotropis ephamilla V. vi, 162.
B. range, 1,917 f.†; 2,221 f.* Off Chesapeake Bay.

Typhlomangilia Tanneri V. and S. vi, 163, pl. 31, f. 8. Fig. 78.
B. range, 1,290 f.

Taranis Mörchii (Malm) Jeffreys. v. 486, pl. 57, f. 18.
B. range, 365 f.†; 368 to 858 f.* N., Arc., Eu., Cb.

Taranis Mörchii, var. *tornatus* V. vi, 251.
B. range, 1,255 f. Off Nova Scotia.

Taranis pulchella V. v, 487, pl. 57, f. 17; vi, pl. 29, f. 8. Fig. 77.
B. range, 349 to 487 f.

Admete inflata Friele=*Trichotropis inflata* Friele. vi. 178.
B. range, 1,290 f. Arc.

RACHIGLOSSA.

Marginella borealis V. vi, 165, pl. 29, f. 4. Fig. 79.
B. range, 64 to 100 f.†; 66½ to 81 f.*

Volutella lachrimula Gld.* vi, 166.
B. range, 142 f.*; 516 f.† Off Cape Hatteras. S.

Buccinum undatum Linné. v, pl. 58, f. 10.
B. range, 6 to 123 f.*; 142½ to 843 f.† N., Arc., Eu.

Buccinum cyaneum Brug. v, 492, pl. 43, f. 5; pl. 58, f. 11.
B. range, 101 to 150 f., off Cape Cod. N., Arc., Eu.

Buccinum abyssorum V. and S. vi, 167, pl. 31, f. 11–11*b*. Figs. 80, *a*.
B. range, 49 f.†; 906 to 1,309 f.*

Sipho Stimpsonii Mörch. v, 499, pl. 57, f. 24.
B. range, 16 to 300 f. N.

Sipho Stimpsonii, var. *liratulus* V. v, 500.
B. range, 18 f.†; 55 to 319 f.* N.

Sipho pubescens V. v, 501, pl. 43, f. 6; pl. 57, f. 25.
B. range, 18 to 179 f.†; 192 to 640 f.* N.

Sipho pygmæus (Gld.) V. v, 501, pl. 57, f. 21.
B. range, 12 to 640 f. N.

Sipho parvus V. and S. v, 504, pl. 57, f. 20–20*b*.
B. range, 193 to 906 f.

Sipho obesus V. vi, 168.
B. range, 843 f. Off Cape Hatteras.

Sipho profundicola V. and S. vi, 170, pl. 31, f. 13. Fig. 81.
B. range, 1,497 to 1,917 f.†; 2,033 f.*

Sipho profundicola, var. *dispar* V. vi, 171.
B. range, 1,555 f.

Sipho glyptus V. v, 505, pl. 57, f. 22; pl. 58, f. 1, 1*a*. Fig. 82.
B. range, 193 to 547 f.

Sipho cælatus V. v, 506, pl. 57, f. 19, 19*a*.
B. range, 75 to 616 f.†; 302 to 516 f.*

Sipho cælatus, var. *hebes* V. vi, 172.
B. range, 640 to 1,255 f.

Sipho (Mohnia) *cælatulus* V. vi, 172.
B. range, 516 to 547 f.†; 906 to 1,290 f.*

Sipho (Mohnia) *simplex* V. vi, 174.
B. range, 99½ f.†; 843 f.*

Sipho (?) *hispidulus* V. vi, 239.
B. range, 2,033 f.* Off Delaware Bay.

Neptunea despecta (Linné) Ad., var. *tornata* (Gld.).
B. range, 69 to 100 f.† off George's Bank. N., Arc., Eu.

Neptunea decemcostata (Say) H. and A. Ad.
B. range, 6 to 322 f.†; 41 to 86 f.* N.

Trophon clavatus Sars. (?) vi, 176.
B. range, 843 to 2,033 f. Eu. (?)

Urosalpinx Carolinensis V. vi, 237.
B. range, 142 to 516 f.†; 938 f.* Off Cape Hatteras.

Urosalpinx macra V. vi, 239.
B. range, 142 f.†

Anachis Haliæeti (Jeff.). v, 513, pl. 43, f. 7; vi, 252.
B. range, 79 f.†; 115 to 640 f.* N., Arc., Eu.

Astyris diaphana V. v, 513, pl. 58, f. 2.
B. range, 64 f.†; 100 to 487 f.*

Astyris pura V. v, 515.
B. range, 71 f.†; 100 to 1,255 f.*

TÆNIOGLOSSA.

Dolium Bairdii V. and S. v, 515; vi, 253, pl. 29, f. 2–2*b*. Figs. 83, 83*a*.
B. range, 89 to 234 f.†; 98 to 202 f.*

Benthodolium abyssorum V. and S. vi, 177, pl. 31, f. 12–12*b*. Figs. 84, 84*a*.
B. range, 1,395 f.†; 2,221 f.* Off Chesapeake Bay.

Natica clausa Brod. and Sowerby.
B. range, 13 to 1,255 f.†; 238 to 843 f.* N., Arc., Eu.

Lunatia heros (Say) H. and A. Adams.
B. range, 0 to 238 f. N., S.

Lunatia Grönlandica (Möll.) Ad.
B. range, 12 to 65 f.†; 75 to 1,290 f.* N., Arc., Eu.

Lamellaria pellucida, var. *Gouldii* V. v, 518, pl. 58, f. 3.
B. range, 44 to 1,497 f.

Piliscus commodus (Midd.). vi, 191.
B. range, 150 f., off Nova Scotia. Arc., Eu., P.

Capulus Hungaricus (Linné). v, 519; vi, pl. 29, f. 6.
B. range, 71* to 458 f. Eu.

Crucibulum striatum (Say) H. and A. Adams.
B. range, 3 to 65 f.*; 100 f.† N.

Crepidula plana Say.
B. range, 0 to 55 f.*; 155 to 487 f.† N., S.

Velutina lævigata (L.) Gld.
B. range, 15 to 86 f.*; 100 to 130 f.† N., Arc., Eu.

Torellia fimbriata V. and S. v, 520, pl. 57, f. 27, 27*a*. Fig. 85.
B. range, 142 to 321 f.

Torellia vestita Jeff. v, 521, pl. 42, f. 5.
B. range, 4 to 86 f.†; 146 to 317 f.* N., Eu.

Litiopa bombyx Rang. v, 523.
Surface.* S., O.

Cingula Jan-Mayeni (Friele) V. v, 524, pl. 42, f. 8. Fig. 86.
B. range, 238 to 1,290 f. N., Arc.

Cingula brychia V. vi, 179, pl. 32, f. 9.
B. range, 349 to 1,290 f.

Cingula syngenes V. vi, 180, pl. 32, f. 11.
B. range, 142 f.† Off Cape Hatteras.

Cingula leptalea V. vi, 182, pl. 32, f. 10.
B. range, 858 f. Off Nova Scotia.

Cingula apicina V. vi, 183, pl. 32, f. 8.
B. range, 1,608 f.

Cingula Sandersoni V. vi, 241.
B. range, 142 f.† Off Cape Hatteras.

Cithna tenella, var. *costulata* Jeff. vi, 184.
B. range, 2,033 f. Off Delaware Bay. Eu., Med., Azores.

Cithna cingulata V. vi, 184, pl. 32, f. 7.
B. range, 906 to 1,290 f.†; 1,467 f.*

Cithna (?) olivacea V. vi, 185, pl. 29, f. 5.
B. range, 193 to 1,290 f.†

Fossarus elegans V. and S. v. 522, pl. 57, f. 28. Fig. 87.
B. range, 100 to 142 f.†

Seguenzia formosa Jeff. vi, 186, pl. 31, f. 14–14*b*. Figs. 88, 88*a*.
B. range, 1,290 to 2,033 f. Eu.

Seguenzia formosa, var. *nitida* V. vi, 188.
B. range, 2,033 f. Off Delaware Bay.

Seguenzia eritima V. vi, 189, pl. 31, f. 15. Fig. 89.
B. range, 1,290 to 2,033 f.

Cerithiella Whiteavesii V. v, 522, pl. 42, f. 7.
B. range, 238 to 843 f. N.

Aporrhais occidentalis Beck.
B. range, 34 to 1,000 f.†; 115 to 349 f.* N.

PTENOGLOSSA.

Scalaria Dalliana V. and S. v, 527, pl. 57, f. 33. Fig. 91.
B. range. 85 f.†; 115 to 193 f.*

Scalaria Andrewsii V. v, 526, pl. 57, f. 35. Fig. 94.
B. range, 100 f.†; 547 f.*

Acirsa gracilis V. v, 528, pl. 57, f. 31.
B. range, 349 to 843 f.†; 487 to 547 f.*

Aclis Walleri J. v. 528, pl. 57, f. 36.
B. range, 349 f.†; 365 to 938 f.* Eu.

Ianthina fragilis Desh.
Surface.† S., O.

RHIPHIDOGLOSSA.

Rotella cryptospira V. vi, 241.
B. range, 142 f.† Off Cape Hatteras.

Ethalia multistriata V. vi, 242.
B. range, 142 f.† Off Cape Hatteras.

Leptothyra induta Watson. vi, 197.
B. range, 142 f.† Off Cape Hatteras.

Calliostoma occidentale (Mighels).
B. range, 207 f.†; 365 to 640 f.* N., Arc., Eu.

Calliostoma Bairdii V. and S. v, 530, pl. 57, f. 26. Fig. 96.
B. range, 56 to 640 f.†; 64 to 192 f.* Cb.

Margarita regalis V. and S. v, 530, pl. 57, f. 37; vi, 254, pl. 29, f. 14. Fig. 97.
B. range, 64 to 173 f.†; 193 to 1,555 f.*

Machæroplax obscura (Couth.) Friele.
B. range, 12½ to 487 f. N., Arc., Eu.

Cyclostrema Dalli V. v, 532, pl. 57, f. 39; vi, pl. 29, f. 15. Fig. 99.
B. range, 487 to 858 f.

Cyclostrema Dalli, var. *ornatum* V. vi, 255, pl. 32, f. 17.
B. range, 843 f.

Cyclostrema cingulatum V. vi, 198, pl. 32, f. 14.
B. range. 547 f.†

Cyclostrema, sp. (=*C. affine* V. vi, 199, pl. 32, f. 15, *non* Jeffreys).
B. range, 365 to 858 f.†; 843 f.*

Cyclostrema diaphanum V. vi. 199, pl. 32, f. 16.
B. range, 1,290 f.*; 2,033 f.†

Tharsis, sp. vi, 201.
B. range, 843 f.† Off Cape Hatteras.

Fissurella Tanneri V. vi, 255, pl. 29, f. 13, 13*a*.
B. range, 104 f.*; 142 f.† Southern.

Puncturella noachina (L.) Lowe.
B. range, 16 f.†; 34 to 640 f.* N., Arc., Eu.

Puncturella (Fissurisepta) *eritmeta* V. vi, 204, pl. 32, f. 19, 19*a*.
B. range, 1,451 f.

Propilidium elegans V. vi, 205.
B. range, 1,395 f. Off Chesapeake Bay.

Addisonia paradoxa Dall. v, 533; vi, 256, pl. 29, f. 10, 11–11*b*. Figs. 100, 100*a*.
B. range. 66 to 202 f.†; 71 to 156 f.* (? Eu., Med.).‡

Cocculina leptalea V. vi, 202, pl. 32, f. 20–20*b*. Fig. 101.
B. range, 1,395 to 2,033 f. Southern.

Cocculina spinigera Jeff. vi, 203.
B. range, 335 to 843 f. Eu.

Cocculina conica V. vi, 204.
B. range, 499 f. Off Nova Scotia.

Lepetella tubicola V. and S. v, 534, pl. 58, f. 29–29*a*.
B. range, 142 to 547 f.†; 134 to 396 f.* Eu.

POLYPLACOPHORA.

Hanleyia mendicaria (Migh.) Carp. v, 534.
B. range, 49 to 317 f. N. Arc., Eu., Med.

‡ By Mr. Jeffreys this species is identified with *A. eccentros* Jeff. = *Gadinia excentrica* Tib., of the Mediterranean. (Proc. Z. Soc. London, 1882, p. 673.)

Trachydermon albus (Linné.) Carp.
B. range, 99 f., off Nova Scotia. Arc., Eu.

Trachydermon exaratus (Sars). vi, 208, pl. 30, f. 2–2*b*.
B. range, 101 to 194 f. Eu.

Leptochiton alveolus (Sars) Lovén. v, 534.
B. range, 99 to 640 f. N., Eu.

Placophora (Euplacophora) *Atlantica* V. and S. vi, 206, pl. 30, f. 1, 1*b*.
Figs. 102, 102*a*.
B. range, 122 to 640 f.

GYMNOGLOSSA.

Stilifer Stimpsoni V. v, 535, f. 2.
B. range, 6 to 1,255 f. N.

Stilifer curtus V. v, 535.
B. range, 410 to 1,255 f.

Eulima stenostoma Jeff. v, 536; vi, 254.
B. range, 843 to 1,451 f.*; 1,467 f.† N., Eu.

Turbonilla Rathbuni V. and S. v, 536, pl. 58, f. 15. Fig. 104.
B. range, 64 to 1,395 f.†; 100 to 365 f.*

Turbonilla Bushiana V. v, 537, pl. 58, f. 16.
B. range, 365 to 1,290 f.*; 1,451 to 1,467 f.†

Eulimella lucida V. vi, 192, pl. 32, f. 3, 3*a*.
B. range, 2,033 f.

Eulimella chariessa V. vi, 193, pl. 32, f. 4–4*b*.
B. range, 2,033 f.

Eulimella nitida V. vi, 194, pl. 32, f. 5.
B. range, 2,033 f.†

Eulimella (or *Menestho*) *lissa* V. vi, 195, pl. 32, f. 6.
B. range, 142 f. Off Cape Hatteras.

Odostomia tornata V. vi, 196.
B. range, 142 f.† Off Cape Hatteras.

Odostomia disparilis V. vi, 196.
B. range, 142 f.† Off Cape Hatteras.

TECTIBRANCHIATA.

Actæon nitidus V. v, 540, pl. 58, f. 21.
B. range, 238 to 843 f.*; 1,451 f.†

Actæon melampoides Dall. vi, 210.
B. range, 843 f.† Off Cape Hatteras. Ob.

Ringicula nitida V. v, 540.
B. range, 100 to 547 f.†; 120 to 487 f.* Ob.

Scaphander nobilis V. vi, 209, pl. 32, f. 18–18*d*. Fig. 106.
B. range, 906 f.†; 1,091 to 1,309 f.*

Scaphander puncto-striatus (Migh.) Ad.
B. range, 46 to 1,255 f.*; 1,362 to 1,467 f.† N., Arc., Eu.

Philine quadrata (Wood) Forb. and Han.
B. range, 20 to 266, f.†; 312 to 480 f.* N., Arc., Eu.

Amphisphyra globosa Lovén. v, 543.
B. range, 115 to 155 f.†; 319 to 843 f.* N., Eu.

Diaphana gemma V. v, 543, pl. 58, f. 22.
B. range, 100 to 2,033 f.

Diaphana nitidula (Lov.) v, 543.
B. range, 155 to 906 f. Eu.

Cylichna alba (Brown) Lovén.
B. range, 12 to 1,091 f.*; 1,290 f.† N., Arc., Eu.

Cylichna (?) *Dalli* V. v, 542; vi, pl. 29, f. 15.
B. range, 452 to 906 f.†; 938 to 1,290 f.*

Cylichna occulta (Migh.) Ad.
B. range, 100 to 1,467 f.*; 1,608 f.† N., Arc., Eu.

Pleurobranchæa tarda V. v, 546, pl. 58, f. 26. Fig. 105.
B. range, 28 to 640 f.

Koonsia obesa V. v, 545; vi, pl. 28 f. 7. Fig. 107.
B. range, 192 to 312 f.

NUDIBRANCHIATA.

Scyllæa Edwardsii V. v, 550, pl. 43, f. 10. Fig. 109.
Surface.* Wood's Holl; off Cape Hatteras. Oc.

HETEROPODA.

Atlanta Peronii Les. v, 529; vi, pl. 28, f. 4, 4*a*.. Figs. 110, 110*a*.
B. range, 15½ to 1,608 f.† Oc.

Atlanta Gaudichaudii Eyd. and Soul. vi, 211. Fig. 111.
Surface.* Oc.

Atlanta rosea Soul. vi, 211.
B. range, 843 to 2,369 f.†; surface.* Oc.

Atlanta Lamanonii Eyd. and Soul. vi, 211.
B. range, 1,731 f.† Oc.

Atlanta pulchella V. vi, 211.
Surface.* Oc.

Atlanta inclinata Soul. vi, 211.
B. range, 516 to 843 f.†; surface.* Oc.

Firoloidea Lesueurii Eyd. and Soul.
Surface.* Station 2194.

Firola Keraudrenii Eyd. & Soul. Fig. 112.
Surface.* Stations 2038 and 2039.

PTEROPODA.

Cymbulia calceolus V. v, 553, pl. 58, f. 33. Fig. 120.
B. range, 18 to 1,467 f.†; surface.* Oc.

Cavolina tridentata (Gmelin) Gray. v, 554, f. 6, 7.
B. range, 45 to 2,033 f.†; surface.* Oc.

Cavolina uncinata (D'Orb.) Gray. v, 554. Fig. 116.
B. range, 64 to 1,608 f.†; surface.* Oc.

Cavolina longirostris (Les.) v, 555.
B. range, 64 to 2,033 f.†; surface.* Oc.

Cavolina gibbosa (Rang). vi, 213.
B. range, 193 to 1,451 f.† Oc.

Cavolina quadridentata (Lesueur). vi, 212.
B. range, 142 to 1,467 f.† Oc.

Cavolina angulata (Soul). vi, 213.
Surface.* Oc.

Cavolina inflexa (Les.) Gray. v, 555.
B. range, 487 to 1,467 f.† Oc.

Pleuropus Hargeri V. v, 555; vi, pl. 28, f. 3. Fig. 114.
Surface.* Oc.

Diacria trispinosa Gray. Fig. 115.
B. range, 64 to 1,451 f.†; surface.* Oc.

Clio pyramidata Linné. v, 555.
B. range, 64 to 2,033 f.† Oc.

Balantium recurvum Children. v, 556
B. range, 64 to 1,917 f.† Oc.

Triptera columnella (Rang). v. 557; vi, 214. Fig. 117.
B. range, 142 to 1,608 f.† Oc., S.

Styliola virgula (Rang). vi, 213.
Surface.* Oc., S.

Styliola virgula, var. *corniformis* (D'Orb.). vi, 214.
Surface.* Oc., S.

Styliola subulata (Quoy and Gaimard). vi, 213.
B. range, 15½ to 1,467 f.†; surface.* Oc., S.

Styliola recta Blainv. v, 556. Fig. 118.
Surface.* Oc., S.

Spirialis retroversus (Flem.), var. *MacAndrei* Forbes. v, 557.
B. range, 499 to 1,731 f.†; Surface.* Oc., Eu., Med.

Spirialis Gouldii St. (? *S. balea* Möll., var.).
B. range, 858 to 1,735 f.† Oc., N., Eu.

Spirialis bulimoides Soul. vi, 215.
Surface.* Oc., S.

Spirialis trochiformis Soul. vi, 214.
Surface.* Oc., S.

Clione papilionacea Pallas. Fig. 122.
Surface.* Oc., N., Arc., Eu.

Clione longicaudata Soul. vi, 215.
Surface.* Oc.

Trichocyclus Dumereilii (Oken) Esch. vi, 215.
Surface.* Oc.

SOLENOCONCHA.

Dentalium solidum V. vi, 215.
B. range, 843 to 1,309 f.

Dentalium striolatum Stimp.
B. range, 25 to 115 f.†; 146 to 1,255 f.* N., Eu.

Dentalium occidentale Stimp. v, pl. 42, f. 16–18. Figs. 123, 124, 125, *a*.
B. range, 26 to 115 f.†; 146 to 1,255 f.* N., Eu.

Dentalium occidentale, var. *sulcatum* V. vi, 217.
B. range, 75 to 1,255 f.*

Dentalium, sp. *g*. vi, 217.
B. range, 1,731 to 2,033 f. Southern.

Dentalium, sp. *h*. vi, 217.
B. range, 843 f.†; 2,033 f.* Southern.

Siphodentalium vitreum M. Sars. v, 557, pl. 42, f. 19.
B. range, 100 f.†; 349 to 1,290 f.* N., Arc., Eu.

Siphodentalium teres Jeff. vi, 218.
B. range, 843 f.†; 858 to 1,290 f.* Eu.

Siphonentalis affinis (Sars). v, 558, pl. 42, f. 20, *a*, *b*.
B. range, 349 to 365 f.†; 499 to 1,731 f.* N., Eu., Azores.

Cadulus Pandionis V. and S. v, 558, pl. 58, f. 30, 30*a*. Fig. 126, *a*.
B. range, 85 to 487 f.*; 516 f.† (? Eu., Med., Af.).

Cadulus Watsoni Dall. vi, 219.
B. range, 197 to 938 f.†; 547 to 843 f.* Ob.

Cadulus grandis V. vi, 219.
B. range, 843 to 1,290 f.†; 906 to 1,098 f.*

Cadulus spectabilis Verrill. 1885.
B. range, 1,467 f.†

Cadulus Jeffreysii ? (Monteros.). v, 559; vi, 257.
B. range, 115 f.*; 516 to 843 f.† Eu., Azores.

Cadulus subfusiformis Jeff.
B. range, 100 to 115 f. Eu., Med.

Cadulus cylindratus Jeff. vi, 220.
B. range, 1,608 f. Eu.

LAMELLIBRANCHIATA.

Teredo megotara Hanley. Fig. 127, animal.
B. range, 55 f.†; 100 to 1,467 f.*; surface* in wood. S., O., Eu.

Xylophaga dorsalis (Turt.) F. and Han. v, 559, pl. 44, f. 9.
B. range, 32 to 2,033 f. N., Eu., Med.

Ensatella Americana (Gld.) V.
B. range, 0 to 28 f.*; 64 to 89 f.† N., S.

Saxicava Norvegica (Speng.) Woodw.
B. range, 20 to 506 f.†; 300 f.* N., Arc., Eu., P.

Cyrtodaria siliqua (Speng.) Woodw.
B. range, 28 to 258 f.† N., Arc.

Poromya sublevis V. vi, 221, pl. 32, f. 21. Fig. 128.
B. range, 1,917 f.† Off Chesapeake Bay.

Neæra obesa Lovén. v, 563, pl. 44, f. 10, *c*.
B. range, 192 to 1,290 f.; 20 to 150 f. N. of Cape Cod. N., Arc., Eu., Azores.

Neæra glacialis G. O. Sars. v, 562, pl. 44, f, 10, *a*, *b*.
B. range, 64 to 547 f. N., Arc., Eu.

Neæra rostrata (Speng.) Lovén. v, 562, pl. 58, f. 39.
B. range, 65 to 487 f.†; 85 to 155 f.* N., Eu., Med., Af., Azores, Cb., Patagonia.

Neæra lamellosa M. Sars. v, 561; vi, pl. 30, f. 3.
B. range, 319 to 547 f. Eu., Med., Af.

Neæra gigantea V. vi, 223.
B. range, 1,917 f.† Off Chesapeake Bay.

Neæra undata V. vi, 223.
B. range, 2,221 f.† Off Chesapeake Bay.

Neæra, sp.
B. range, 142 f. Off Cape Hatteras.

Periploma papyracea (Say) Con.
B. range, 7 to 1,255 f. N.

Cochlodesma Leanum Couth.
B. range, 2 to 20 f.*; 65 f.† S.

Thracia Conradi Couth.
B. range, 4 to 193 f.†; 34 f.* N.

Thracia nitida V. vi, 221, pl. 32, f. 22. Fig. 130.
B. range, 1,917 f. Off Chesapeake Bay.

Pecchiolia abyssicola Sars. v. 565.
B. range, 192 to 487 f.*; 516 to 1,290 f.† N., Arc., Eu.

Pecchiolia gemma V. v, 565; vi, 258, pl. 30, f. 7, 8.
B. range, 75 to 1,290 f.†; 499 to 906 f.*

Mytilimeria flexuosa V. and S. v, 567, pl. 58, f. 38; vi, 258. Figs. 132, *a*, *b*.
B. range, 75 to 319 f.†; 349 f.*

Ceronia arctata (Con.) Ad.
B. range, 0 to 183 f.†; 0 to 2 f.* N.

Abra longicallis (Scacchi). vi, 224.
B. range, 1,467 f.† Eu., Med., Canaries, Af., Azores, Cb.

Macoma sabulosa (Speng.) Mörch.
B. range, 30 to 208 f.†; 29 to 1,255 f.* N., Arc., Eu., P., As.

Cyprina Islandica (Linné) Lam.
B. range, 8 to 128 f.*; 130 to 349 f.† N., Arc., Eu.

Astarte castanea Say.
B. range, 0 to 100 f.*; 142 to 435 f.† N., S.

Astarte undata Gld.
B. range, 8 to 480 f. N.

Astarte crenata Gray.
B. range, 34 to 640 f. N., Arc., Eu., As.

Venericardia granulata (Say)=*borealis* Con. v, 572; vi, 258.
B. range, 8 to 435 f.†; 9 to 192 f.* N.

Loripes lens V. and S. v, 569; vi, 259.
B. range, 5 to 192 f.†; 120 f.* N.

Lucina filosa Stimp.
B. range, 4 to 349 f.†; 20 to 30 f.* N.

Cryptodon subovatus (J.) V. v, 570.
B. range, 480 f.†; 499 f.* Eu., Af.

Cryptodon Gouldii (Phil.) Stimp.
B. range, 6 to 1,467 f. N., Eu.

Cryptodon obesus V. v, 569.
B. range, 12 to 100 f.†; 115 to 1,290 f.* N.

Cryptodon grandis V. 1885.
B. range, 938 f.†, 1883; 965* and 1,582 fathoms†, 1884.

Cryptodon ferruginosus (Forbes). v, 570.
B. range, 100 to 1,467 f. N. Arc., Eu., Med.

Cryptodon tortuosus (Jeff.). vi, 226.
B. range, 499 to 1,290 f. Eu.

Axinopsis, sp. nov.
B. range, 1,451 f.

Diplodonta turgida V. and S. v, 569, pl. 58, f. 42; vi, pl. 30, f. 10, 11. Figs. 135, 136.
B. range, 65 to 98 f.†

Montacuta tumidula Jeff. vi, 225.
B. range, 843 to 1,091 f. Southern. Eu.

Kelliella, sp. nov.
B. range, 2,033 f.

Yoldia thraciformis (Storer) Stimp. Figs. 137, 138, animal.
B. range, 29 to 182 f.†; 192 to 906 f.* N.

Yoldia sapotilla (Gld.) Stimp. Fig. 139, animal.
B. range, 4 f.†; 12 to 321 f.* N., Arc.

Yoldia expansa Jeff.
B. range, 365 f.*; 1,451 to 1,467 f.† Eu.

Yoldia lucida Lovén. v, pl. 44, f. 1.
B. range, 29 to 1,608 f.†; 115 to 1,290 f.* N., Arc., Eu., Med.

Yoldia frigida Torell. v, 573, pl. 44, f. 2.
B. range, 157 to 1,255 f. N., Arc., Eu., Med., As.

Yoldia Jeffreysi (Hidalgo). vi, 229.
B. range, 349 f.*; 499 to 1,290 f.† Eu., Med., Af., Azores, Cb.

Yoldia subequilatera (Jeff.). vi, 229.
B. range, 499 to 1,731 f. Eu., Arc.

Yoldia sericea Jeffreys, var. *striolata* J. vi, 226.
B. range, 516 to 1,731 f. Eu.

Yoldia Messanensis (Seguenza), var. vi, 227.
B. range, 1,451 to 2,033 f.†; 1,467 f.* Eu., Med., Azores, Cb.

Leda Bushiana V. vi, 229.
B. range, 516 f. Off Cape Hatteras.

Leda tenuisulcata (Couth.) Stimp.
B. range, 25 to 120 f.†; 640 f.* N.

Phaseolus ovatus ? (Jeff. MSS.). vi. 230.
B. range, 1,290 f. (? Eu.)

Malletia obtusa (M. Sars) Mörch. vi, 226.
B. range, 516 f.†; 788 to 1,608 f.* Eu., Med.

Glomus nitens Jeff. vi, 231.
B. range, 1,608 f.† Eu.

Nucula delphinodonta Mighels.
B. range, 10 to 1,290 f. N., Arc., Eu.

Nucula proxima Say.
B. range, 3 to 302 f.*; 310 to 516 f.† S.

Nucula tenuis (Mont.) Turton.
B. range, 75 to 266 f.†; 302 to 1,255 f.* N., Arc., Eu., Med., Cb., P., As.

Nucula cancellata Jeff. vi, 231.
B. range, 858 f.†; 906 to 2,033 f.* Eu., Azores.

Nucula granulosa Verrill. vi, p. 280.
B. range, 487 to 858 f.*

Arca pectunculoides Sc. v, 573, pl. 44, f. 6.
B. range, 79 to 640 f. N., Eu., Med., Cb.

Arca pectunculoides, var. *septentrionalis* Sars. v, 573.
B. range, 79 to 640 f. N., Arc.

Limopsis minuta (Phil.). v, 576.
B. range, 64 to 115 f.†; 120 to 2,221 f.* N., Arc., Eu., Med., Af., Azores.

Limopsis cristata Jeff. v, 577; vi, 231.
B. range, 549 f.† Eu., Med.

Limopsis plana Verrill, 1885.
B. range, 197 to 2,221 f.

Limopsis tenella Jeff. vi, 232.
B. range, 1,731 to 2,033 f. Eu.

Mytilus edulis Linné.
B. range, 0 to 57 f.*; 1,608 f.† (perhaps from surface *Fuci*). Oc., S., N., Arc., Eu., Med., P., Antarctic.

Modiola modiolus (Linné) Turton.
B. range, 0 to 115 f.*; 202 f.† N., Arc., Eu., P., As.

Modiolaria discors (Linné) Lovén.
B. range, 15 to 90 f. N., Arc., Eu., Med., P., As.

Idas argenteus Jeff. v, 579; vi, pl. 30, f. 16, 16*a*.
B. range, 335 to 2,033 f.* in wood. Surface? (in wood). Eu.

Dacrydium vitreum (Möll.) Torell. v, 579, pl. 44, f. 8, 8*a*.
B. range, 300 f.†; 312 to 1,555 f.* N., Arc., Eu., Med., Af., Azores.

Pecten Clintonius Say. vi, 261.
B. range, 8 to 349 f.†; 13 to 146 f.* N.

Pecten Islandicus Müller.
B. range, 33 to 122 f.*; 124 to 194 f.† N., Arc., Eu., P., As.

Pecten glyptus V. v. 580.
B. range, 69 to 156 f.†

Pecten vitreus (Gmel.) Wood. v, 580, pl. 42, f. 21.
B. range, 57 to 64 f.†; 100 to 787 f.* N., Arc., Eu., Med., Af.

Pecten pustulosus V. v, 581, pl. 42, f. 22, 22*a*; vi, 261. Figs. 142, *a*.
B. range, 99 to 321 f.*; 365 to 547 f.† N., Eu.?

Pecten leptaleus V. vi, 232.
B. range, 142 f. Off Cape Hatteras.

Pecten fragilis Jeff. vi, 232.
B. range, 843 f. Off Cape Hatteras. Arc., Eu., Azores.

Limæa subovata (Jeff.) Monteros. v, 580.
B. range, 100 to 1,362 f.†; 252 to 1,290 f.* Eu., Arc., Med., Azores.

Avicula hirundo, var. *nitida* V. v, 582, pl. 58, f. 43.
B. range, 64 to 192 f. Oc.

Avicula squamulosa? Lam. vi, 233.
Surface. S., Oc.

Anomia aculeata Müll.
B. range, 4 to 640 f. N., Arc., Eu.

BRACHIOPODA.

Terebratulina septentrionalis (Couth.)
B. range, 16 to 396 f. N., Arc., Eu., Af.

Waldheimia cranium (Müller) Davidson. vi, 234.
B. range, 1,362 f.†. Arc., Eu., P.

Discina Atlantica King. vi, 233.
B. range, 1,251 to 1,467 f.† Eu., Arc., Med., Australia.

FAUNA OF THE SHALLOW WATER NEAR CAPE HATTERAS.

The first and the last trips of the season were made to the wáters off Chesapeake Bay and Cape Hatteras. In that region, besides some interesting hauls that were made in deep water, a few were made in shallow water, during the stormy weather encountered on the last trip. These were near the coast, in 15 to 145 fathoms (stations 2107 to 2109, 2112 to 2114). They proved to be of great interest, for scarcely anything had been previously known respecting the fauna inhabiting the outside waters, in moderate depths, off our Southern Atlantic coasts north of Florida, most of the inshore collecting in that region having been carried on in the harbors and sheltered sounds, while the dredgings by the "Blake" and "Fish Hawk" were mostly in deep water far from the shore.

From these few shallow-water dredgings made by the "Albatross" a large number of interesting additions to the known Mollusca of the Atlantic coast have been obtained. Many of these are West Indian species, not known before from north of Cuba, while a considerable number are undescribed. Among the interesting discoveries was a handsome living *Conus* of good size, from 48 fathoms. It resembles the *Conus Delessertii* Recluz. The general character of the Mollusca is decidedly more tropical, or rather "warm-temperate," than that of the shore fauna of the adjacent coast. But with the southern forms, such as species of *Conus*, *Oliva*, *Olivella*, *Marginella*, *Cancellaria*, *Semicassis*, *Solarium*, &c., there are also many northern species, common on the New England coast, but hitherto not known to live so far south. It appears very strange to see West Indian and northern or even Arctic species mingled together in the same haul of the dredge. The mildness and unusual uniformity of temperature during the whole year, due to the greatly diminished volume, or absence of the arctic current, over

the inshore plateau, and to the effect of the Gulf Stream in winter, are doubtless the causes of this peculiar assemblage.

These shallow-water shells, which are mostly of small size, have been studied with care by Miss K. J. Bush, who has identified many of the known species and described several of the new ones. I am greatly indebted to her for the accompanying list of the species already determined, but the study of these shells is not yet completed, and this list must, therefore, be regarded only as a partial one.‡

The representatives of other groups were of less importance than the shells, but several interesting southern species of Echinoderms and Anthozoa were taken, of which the bathymetrical range is little known. Among these were specimens of the branched coral, *Oculina implicata* V., and the leaf-like *Renilla reniformis* Cuv. The southern shallow-water star-fishes, *Luidia clathrata* Say and *Astropecten articulatus* Say, also occurred in these localities, in 14 to 25 fathoms. During the more extended explorations in the same region in 1884, *Ophiothrix angulata* and *Amphiura elegans* (= *tenuis* Ayres) occurred in 16 fathoms, while the curious West Indian *Astroporpa annulata* occurred several times, of large size, clinging to the Gorgonian, *Titanidcum suberosum* V., in 48 to 68 fathoms.

LIST OF THE SHALLOW-WATER MOLLUSCA DREDGED OFF CAPE HATTERAS BY THE "ALBATROSS" IN 1883.

By Miss K. J. Bush.

The following list is not intended as a complete list of the shells of this region, but is nearly complete for the work of 1883. Many additional species were dredged in the same region, in the autumn of 1884. The bathymetrical range refers only to the collection of 1883. Most of the common species also occur in very shallow water in the harbor of Beaufort, N. C., or even at low-water mark. An asterisk (*) indicates specimens living; a dagger (†), dead shells only.

CEPHALOPODA.

Sthenoteuthis Bartramii (Lesueur) Verrill.
Surface.*

GASTROPODA.

TOXOGLOSSA.

Conus Delessertii (?) Recluz.
B. range, 48 fathoms.*

‡Another and more extensive series of dredgings in shallow water in the same region was made by the "Albatross" in 1884, by which a much larger collection was obtained, including, besides many additional Mollusca, a great variety of interesting Crustacea, among which there are many species not before known from the Atlantic coast of the United States. The additions to the Brachyura are especially interesting and numerous. Many are Floridian and West Indian species.

Mangilia rubella Kurtz and Stimpson.

B. range, 14 fathoms; † 15 fathoms.*

Mangilia cerina (Stimp.) Verrill.

B. range, 14 to 15 fathoms.†

Mangilia ephamilla Bush, sp. nov.

B. range, 14 to 15 fathoms; † 48 fathoms.*

Shell of moderate size, rather stout, with a regularly tapered, acute spire, consisting of about five sharply angulated whorls below the nucleus. Suture marked by a distinctly raised, rounded, undulating, spiral thread. Nucleus small, prominent, semi-transparent, glassy, composed of about two and a half turns, with a small, rather prominent apical whorl, which, with the second, is very smooth; the third is crossed by delicate, curved, transverse riblets, which are rendered somewhat nodulous by the intersection of a single, faint, revolving, median thread; the others have about nine broad, prominent, acute, straight, longitudinal ribs extending from suture to suture, and separated by deep, concave interspaces about equal in width to the ribs. The whole surface is covered with distinctly raised, rounded cinguli and microscopic threads, which are roughened by the intersection of the fine lines of growth, and, under the microscope, have the appearance of being covered with minute grains of sand. The cingulus at the center, defining the shoulder of the whorls, is the most conspicuous; above this there are about five finer ones, and below, on the whorls of the spire, two or three, the number increasing to ten or twelve on the body-whorl. The aperture is a little less than half the length of the shell, narrow, oblong, broadest at its posterior third, pinched up anteriorly into a straight, slightly elongated canal. Outer lip thin (broken); inner lip inconspicuous. No operculum.

Color in alcohol deep yellow, with white ribs and canal.

Length of largest specimen, 6.5^{mm}; breadth, 3^{mm}; length of aperture, 3^{mm}; its breadth, .5^{mm}.

One living specimen (No. 35,404) was taken at station 2,108; also, young dead specimens at stations 2,112 (No. 35,884), and at 2,114 (No. 35,515).

This species is closely allied to *M. cerina*, but differs in having a stouter form, more angularly shouldered whorls, and especially in having very prominent, straight ribs extending from suture to suture.

Mangilia melanitica Dall, var. *oxia* Bush.

B. range, 14 to 15 fathoms.*

Shell small, slender, fusiform, lustrous, transparent, glassy, with a tall, regularly tapered, acute spire; whorls eight, slightly convex, angulated, carinated, with the suture defined by a distinct, smooth, rounded thread; nucleus large, acute, consisting of three and a half rapidly tapering coils, with a small, very prominent, decidedly upturned apical

whorl, smooth, with the exception of a distinct median keel on the two lower whorls. Sculpture consists of about seventeen very thin, slightly raised, strongly recurved riblets extending from suture to suture, rendered nodulous by the intersection of a rather broad, smooth, rounded median carina. The greatest curvature of the transverse riblets is above the carina on the wide, slightly concave subsutural band, which is crossed also by the lines of growth, and in some specimens by numerous microscopic revolving striæ. On the body-whorl, from the posterior end of the aperture to the end of the canal, there are about twelve rather fine, smooth, rounded cinguli; the first, situated just above the suture and a little wider and more prominent than the others, is rendered nodulous by the crossing of the transverse riblets, at which they abruptly end, and is separated from the second by a rather wide, smooth space, crossed only by the microscopic lines of growth; the space between the others decreases so that, on the canal, they are rather close together. On some of the specimens, there is an additional cingulus midway between the carina and the first cingulus; and three or four of the transverse riblets, and sometimes all of them, on the dorsal surface, extend as nearly straight lines to the base of the canal. The aperture, in immature specimens, is rather broad-ovate, with a thin, slightly curved outer lip, having a very shallow, wide posterior sinus, and the columella has a slight sigmoid curvature, most decided at its posterior third, while in more mature specimens the aperture is very narrow-oblong, with a very much thickened outer lip, forming a conspicuous white varix with a thin brown edge bending in and partly closing the aperture, and with a deep, narrow, oblique sinus considerably below the suture. Some specimens have about four smooth, raised, rounded, revolving threads on the interior of the aperture, which form, by their abrupt terminations, conspicuous nodules within the margin of the outer lip. The outer lip also increases posteriorly and joins the inner lip a little below the suture, thus considerably shortening the aperture. Columella nearly straight, with a row of from four to six very minute white crenulations just within the thin free edge of the inner lip; canal very short, narrow at its base, but suddenly widened by the abrupt outward turning of the lip.

Color of fresh specimens, when dry, amber, with lighter tinted carina, and red-brown edged aperture; some specimens are also irregularly spotted with red-brown.

Length of a medium-sized mature specimen, 5^{mm}; its breadth, 2^{mm}; length of aperture, 1.75^{mm}; its breadth, .5^{mm}. A specimen without the thickened lip has an aperture 2^{mm} long and nearly 1^{mm} broad.

Found in large numbers, both living and dead.

Mr. W. H. Dall considers this shell identical with a species from Florida to which he has given the name, *melanitica* (MSS.), but admits a varietal difference.

Mangilia oxytata Bush, sp. nov.

B. range, 48 fathoms.†

At station 2,108, a single dead specimen (No. 35,395), somewhat resembling the preceding, was taken.

It consists of about eight whorls; those of the spire strongly angulated just below the middle, and ornamented with about nine rather prominent, straight, transverse ribs, commencing at the periphery and extending to the suture; these, with their wide, concave interspaces, are crossed by three rather strong, nearly smooth, rounded, equally distant carinæ, the third defining the suture. Smooth, oblong nodules are formed by the intersection of these with the ribs, those on the periphery being the most conspicuous, as the first carina is slightly wider than the other two. The subsutural band is wide, slightly concave, crossed by delicate, excurved, raised lines or riblets extending from the suture to the median carina, and by three or four fine, slightly raised, equally distant, revolving threads. The nucleus is large, semi-transparent, shining, composed of four and a half turns, with a small, exceedingly prominent, decidedly upturned, apical whorl, which, with the two following, is smooth and glassy; the next two have a fine, smooth median carina. On the body-whorl the ribs continue to the base of the siphon, and are crossed by small, nearly smooth, rounded, equally distant cinguli, which commence a little below the third principal carina and continue to the end of the canal. The entire surface is covered with very minute microscopic granules. Aperture narrow-ovate, pinched up anteriorly into a short, rather narrow, straight canal. Outer lip very much thickened, with a conspicuous varix and a thick, smooth, rounded, very irregularly curved, light brown edge, and a deep, narrow sinus considerably below the suture, at the angle of the shoulder; inner lip inconspicuous; columella slightly curved.

Color yellowish white, tinged with brown just below the suture, and on the anterior part of the body-whorl.

Length, 5^{mm}; breadth, 2.5^{mm}; length of aperture; 2^{mm}; its breadth, 1^{mm}.

This species, although closely resembling the preceding, is sufficiently characterized in having a much stouter form, more acute apex, more angularly shouldered whorls, fewer and more prominent ribs, more numerous cinguli, and especially in having its entire surface microscopically granulated.

Mangilia ? glypta Bush, sp. nov.

B. range, 48 fathoms.†

Shell small, semi-transparent, fusiform, with about five slightly convex whorls below the nucleus, which consists of three and a half smooth, transparent, white, glassy, regularly increasing turns. The apical whorl is small, not very prominent, somewhat oblique. The sculpture consists of about ten rather indistinct, narrow, longitudinal ribs, and broad,

rounded, very conspicuous cinguli, which, in crossing the ribs, form prominent, smooth, white, oblong beads or nodules; there are three rows of these on the whorls of the spire, and five or six on the body-whorl, the second and third below the suture being more prominent and farther apart than the others. Cinguli without nodules continue to the end of the canal, the transverse ribs disappearing at its base. Aperture a little more than one-third the length of the shell, narrow-ovate, pinched up anteriorly into a very narrow, short canal; outer lip thickened, forming a slight varix, with a thin, white edge and a shallow sinus, close to the suture, with one or two minute white crenulations just within its posterior edge; there are also about five similar but much larger crenulations on the inner margin of the lip, extending from the sinus to the base of the canal. Inner lip continuous with the outer, with a free, thin, white edge, having four or five minute white crenulations just within its inner margin. Canal short, narrow, bent slightly backward at its anterior end, with a decided, but shallow, notch.

Color of dead specimens, in alcohol, light brown; when dry, dirty white. One fresh specimen has a light brown, lamellose epidermis. It may belong to *Pisania*.

Length of a specimen with imperfect nucleus, 5^{mm}; its breadth, 2.5^{mm}; length of aperture, 2.5^{mm}; its breadth, 1^{mm}.

Three imperfect specimens, (No. 35,363) were taken at station 2,108.

Acus dislocatus (Say).
B. range, 14 to 15 fathoms.†

Acus concavus (Say).
B. range, 14 to 15 fathoms.†

Acus protextus (Conrad) Dall.
B. range, 48 fathoms.†

Cancellaria reticulata (Linné).
B. range, 14 fathoms.†

RACHIGLOSSA.

Oliva literata Lamarck.
B. range, 14 to 15 fathoms.*

Olivella mutica (Say).
B. range, 14 to 15 fathoms;* 48 fathoms.†

Fulgur carica Conrad.

Nassa consensa Ravenel.
B. range, 14 to 48 fathoms.†

Tritia trivittata (Say) H. & A. Adams.
B. range, 14 to 15 fathoms.†

Eupleura caudata (Say) H. & A. Adams.
B. range, 15 fathoms.†

Anachis avara (Say) Perkins.
B. range, 14 fathoms;† 48 fathoms.*

Columbella ornata Ravenel.
B. range, 14 to 15 fathoms.†

Astyris pura Verrill.
B. range, 14 fathoms;* 15 fathoms.†

Astyris lunata (Say) Dall.
B. range, 14 to 15 fathoms;† 48 fathoms.*

TÆNIOGLOSSA.

Semicassis granulosa (Bruguiere).
B. range, 15 fathoms, fragment.

Neverita duplicata (Say) Stimpson.
B. range, 0 to 14 fathoms†; 15 fathoms.*

Natica pusilla Say.
B. range, 14 to 15 fathoms.*

Sigaretus perspectivus Say.
B. range, 15 fathoms.†

Crepidula fornicata Lamarck.
B. range, 15 fathoms;† 48 fathoms.*

Crepidula plana Say.
B. range, 15 to 48 fathoms.†

Crepidula convexa Say.
B. range, 15 fathoms.†

Cerithiopsis Emersonii (Adams).
B. range, 14 to 15 fathoms.†

Cerithiopsis terebralis (Adams).
B. range, 14 fathoms.†

Triforis turris-thomæ (D'Orbigny) Dall.
B. range, 14 fathoms.†

Vermetus radicula Stimpson.
B. range, 14 to 15 fathoms.†

Cœcum pulchellum Stimpson.
B. range, 14 to 15 fathoms.†

Cœcum Cooperi Smith.
B. range, 14 to 15 fathoms.†

Skenea trilix Bush, sp. nov.
B. range, 14 to 15 fathoms.*
This species closely resembles *Adeorbis supranitida* Wood, in form and sculpture, but it has a thin, horny operculum and an animal like *Skenea*.

PTENOGLOSSA.

Scalaria lineata Say.
B. range, 14 to 15 fathoms.†

Scalaria multistriata Say.
B. range, 14 to 15 fathoms.†

Scalaria angulata Say.
B. range, 14 to 15 fathoms.†

Solarium granulatum Lamarck.
B. range, 48 fathoms.*

RHIPHIDOGLOSSA.

Fissurella alternata Say.
B. range, 14 fathoms.†

GYMNOGLOSSA.

Obeliscus crenulatus Holmes.
B. range, 15 fathoms;† 48 fathoms.*

Eulima oleacea Kurtz and Stimpson.
B. range, 15 fathoms.†

Niso œgleës Bush, sp. nov.
B. range, 14 to 15 fathoms.*

Shell of moderate size, regularly tapered, conical, thin, semi-transparent, smooth, shining, consisting of about twelve closely coiled, flattened whorls, with the suture indistinct, defined by a thread of dark, chestnut-brown, above and below which there is an indefinite band of yellowish-white, gradually shading, towards the center of the whorls into light yellow or brown, sometimes mingled with purple. The nucleus is small, consisting of about three regularly coiled whorls of a light purple or amethystine color. Base prominent, angulated, with a moderately large and deep umbilicus, margined by a dark chestnut-brown thread. Aperture nearly quadrangular, the angles being formed at the termination of the dark threads, defining the base and the umbilical region, somewhat produced at the anterior angle, forming an indistinct notch. Outer lip thin, with a dark chestnut-brown edge; inner lip regularly curved, slightly reflected over the umbilicus, with a somewhat thickened, dark chestnut-brown edge; just back of this there runs across the base, from within the umbilicus to the sutural thread, a thread or streak of the same dark chestnut-brown color, and throughout the entire length of the shell, with the exception of the nucleus, similarly colored streaks occur, crossing the whorls at irregular intervals. In specimens somewhat eroded, fine but distinct lines of growth cross the whorls at pretty regular intervals, and even in fresh specimens indications of them are occasionally seen. Operculum horny, very thin, light yellow.

Length of the largest specimen, 7.5^{mm}; its breadth, 3.5^{mm}; length of aperture, 2.5^{mm}; its breadth, 2^{mm}.

A few living and several dead specimens were taken.

Odostomia cancellata (D'Orbigny).
B. range, 14 to 15 fathoms.†

TECTIBRANCHIATA.

Philine Sagra (D'Orbigny).
B. range, 15 fathoms.†

Cylichna biplicata (Lea).
B. range, 14 to 15 fathoms.*

Volvula, sp. nov.
B. range, 14 to 15 fathoms.*

Bulla Candei D'Orbigny.
B. range, 15 fathoms.†

Utriculus canaliculatus (Say) Stimpson.

Pleurophyllidia Cuvieri Meckel.
B. range, 15 fathoms.*

HETEROPODA.

Atlanta Peronii Lesueur.
B. range, 15 to 843 fathoms.†

Atlanta inclinata Souleyet.
B. range, 15 to 843 fathoms.†

PTEROPODA.

Cavolina uncinata (D'Orbigny) Gray.
B. range, 48 to 843 fathoms.†

Cavolina longirostris Lesueur.
B. range, 14 to 938 fathoms.†

Cavolina quadridentata (Lesueur).
B. range, 15 to 192 fathoms.†

Diacria trispinosa Gray.
B. range, 15 to 843 fathoms.†

Clio pyramidata Linné.
B. range, 48 to 938 fathoms.†

Styliola virgula (Rang).
B. range, 15 fathoms.†

Styliola subulata (Quoy and Gaimard).
B. range, 15 to 843 fathoms.†

Styliola recta Blainville.
B. range, 15 fathoms.†

SOLENOCONCHA.

Dentalium leptum Bush, sp. nov.
B. range, 14 to 15 fathoms.†

Shell of moderate size, very slender, slightly curved posteriorly, rather thin, delicate, with a very smooth and glossy surface, destitute of sculpture, except at the posterior end, which is covered with numerous,

crowded, very fine, raised, longitudinal lines visible only under the lens. Anterior aperture round with a sharp, thin edge; posterior aperture somewhat thickened, very small, round, slightly oblique, with a deep, narrow, dorsal notch. Color delicate salmon, or yellow, gradually shading into white toward the anterior end. Several dead specimens.

Length, 31.5^{mm}; diameter of anterior aperture, 2^{mm}; posterior aperture, about .5^{mm}.

Cadulus Carolinensis Bush, sp. nov.

B. range, 14 fathoms;† 15 to 48 fathoms.*

Shell of medium size, semi-transparent, very glossy, white, circular throughout its entire length. Greatest diameter at about the anterior third, diminishing slightly to the round, very oblique, anterior aperture, and backward to the posterior end, at first very gradually and farther back very rapidly. Curvature well marked in some specimens, very slight in others, nearly uniform dorsally; but ventrally, most decided in the posterior third. Posterior aperture very small, round, a little oblique, with four small, distinct notches, two on each side. A few living, and many dead specimens.

Length, 9.5^{mm}; greatest diameter, about 2^{mm}; diameter of anterior aperture, 1^{mm}; posterior aperture, .4^{mm}.

LAMELLIBRANCHIATA.

Ensatella Americana (Gould) Verrill.

B. range, 15 fathoms.†

Corbula disparilis D'Orbigny.

B. range, 14 to 15 fathoms.†

Corbula Swiftiana C. B. Adams.

B. range, 14 to 15 fathoms;† 48 fathoms.*

Nexra costata Bush, sp. nov.

B. range, 48 fathoms.*

Shell moderately thick, compressed, triangular-ovate, with a contracted and somewhat elongated rostrum, and with three or four very prominent, curved, distant, radiating ribs on the convex part of the valves, and with a few smaller and closer ones anteriorly. Umbos high, smooth; beaks somewhat curved backward. The dorsal margin, from the beaks to the end of the rostrum, is strongly and regularly concave, the rostrum being a little upturned or straight at the tip; anteriorly, the dorsal margin is convex, and falls off abruptly to the obtusely rounded anterior end. The ventral margin is broadly rounded and projects outward in an acute angle at the projection of each of the principal ribs; the intervals between these angles are usually concave, and beyond the hindermost rib the outline recedes in a concave curve to the origin of the rostrum, which is rapidly narrowed to near the tip. Of the three principal radiating ribs, the middle one runs from the beak nearly to

the middle of the ventral margin, curving a little backward; the hindermost terminates about midway between the former and the end of the rostrum, curving strongly backward; the most anterior one ends about midway between the middle one and the anterior end of the shell; midway between this and the middle one, there is a smaller secondary rib. These three primary ribs are strongly elevated, not very broad, with the summit rather thin, finely notched by the concentric lines of growth; the most posterior rib is the largest and highest, and projects most at the margin. Between these ribs the spaces are wide and strongly concave, marked by numerous and regular lines of growth. On the anterior end of the shell there are two or three smaller radiating ribs, which are separated by intervals about equal to their own breadth, and give the margin a slightly crenulated appearance. The rostrum is narrow, strongly compressed, with both the dorsal and ventral outline concave. Two small ridges run from the beak to the tip of the rostrum, separated by a very narrow, flattened area. The right valve has two well-marked lateral teeth, the posterior one considerably longer and larger than the anterior; between these there is a small, ovate cartilage-pit. The inner surface of the valves shows deeply indented grooves corresponding to the primary external ribs. Color, opaque white. Epidermis indistinct.

Length of the largest specimen, 6^{mm}; height, 4^{mm}; thickness, 4^{mm}.

Four living and one dead specimens (No. 35,362) were found at station 2,108.

This species bears considerable resemblance to *N. ornatissima* D'Orb., but the ribs are less numerous, more curved, and the primary ones are much larger and more widely separated, and the shell is less convex. There is no other similar species known from the Atlantic coast.

Clidiophora trilineata (Say) Carpenter.

B. range, 14 to 15 fathoms.†

Pandora, sp.

B. range, 14 to 48 fathoms.†

Spisula solidissima (Dillwyn) Gray.

B. range, 14 to 15 fathoms.†

Macha strigillata (Linné), var. (?)

B. range, 15 fathoms.†

Tellina alternata Say.

B. range, 15 fathoms.†

Tellina lintea Conrad.

B. range, 14 to 15 fathoms.†

Tellina iris Say.

B. range, 15 fathoms.*

Angulus tener (Say) Adams.

B. range, 14 to 15 fathoms;* 48 fathoms.†

Strigilla flexuosa (Say).
B. range, 15 fathoms.†

Abra æqualis Say.
B. range, 14 fathoms;* 15 to 48 fathoms.†

Mulinia lateralis (Say) Gray.
B. range, 14 to 15 fathoms.†

Venus mercenaria Linné.
B. range, 14 to 15 fathoms.†

Dosinia discus Reeve.
B. range, 14 to 15 fathoms.†

Dosinia obovata (Conrad).
B. range, 14 to 15 fathoms.†

Chione trapezoidalis? (Kurtz).
B. range, 14 to 15 fathoms.†

Chione alveata (Conrad).
B. range, 15 to 48 fathoms.†

Callista convexa (Say) H. & A. Adams.
B. range, 15 to 48 fathoms.†

Callista gigantea Chemnitz.
B. range, 15 fathoms.†

Callista maculata (Linné).
B. range, 15 fathoms.† (Young.)

Venericardia tridentata Say.
B. range, 15 fathoms.†

Cardium magnum Born.
B. range, 14 to 15 fathoms.†

Cardium pinnulatum Conrad.
B. range, 15 to 48 fathoms.†

Chama congregata Conrad.
B. range, 14 fathoms.†

Lucina filosa Stimpson.
B. range, 48 fathoms.†

Lucina crenulata Conrad.
B. range, 14 to 15 fathoms;† 48 fathoms.*

Lucina nassula Conrad.
B. range, 14 to 15 fathoms.†

Cyclas dentata (Wood).
B. range, 14 to 15 fathoms.†

Cryptodon obesus Verrill.
B. range, 15 to 48 fathoms.†

Diplodonta punctata Say.
B. range, 14 fathoms.†

Montacuta bidentata (Montagu).
B. range, 48 fathoms.*

Leda unca Gould.
B. range, 14 to 48 fathoms.†

Nucula proxima Say.
B. range, 14 to 15 fathoms;† 48 fathoms.*

Scapharca transversa (Say) H. & A. Adams.
B. range, 14 to 15 fathoms.†

Argina pexata (Say) Gray.
B. range, 14 to 15 fathoms.†

Pinna seminuda Lamarck.
B. range, 14 to 48 fathoms.†

Pecten dislocatus Say.
B. range, 14 to 15 fathoms;† 48 fathoms.*

Anomia glabra Verrill.
B. range, 15 fathoms.†

Ostrea equestris Say.
B. range, 14 fathoms.†

FAUNA OF THE SURFACE WATER OF THE GULF STREAM.

Collections of the invertebrate surface fauna were made at many localities during this and previous seasons in the waters of the Gulf Stream, both by means of hand-nets and towing nets, while porpoises (*Delphinus delphis*), sharks, and fishes of various kinds have been taken by the use of harpoons and hooks. By the use of muslin nets, known as "trawl-wings," attached to the ends of the trawl frame, so as to be somewhat above the bottom, many pelagic species have been obtained which have not occurred in the surface nets. It is impossible, however, in many cases to know whether such species actually live at or near the bottom, at the surface, or in intermediate depths, for they are liable to enter these nets at any time during the descent or ascent of the trawl, as well as during the time that it is on the bottom. The trawl-wings have, however, furnished a large number of species, of various groups, which we have never taken in any other way, and it is probable that many of these live swimming free, either near the bottom or at various depths intermediate between the surface and bottom, where the temperature may best suit them. In the surface nets a great many eggs and young of fishes of various kinds are usually taken, the young fishes varying in size from those just hatched up to 2 or 3 inches in length.

Copepod crustacea are usually the most abundant forms of small surface animals, occurring in great quantities and of many genera and species. Various species of the genus *Calanus* are the most common.

Several species of the genus *Saphirina* were taken, some of them very brilliant in colors; also many small shrimp belonging to the Macrura and Schizopoda, and various species of Amphipoda and Isopoda.

The Isopods are usually found clinging to floating sea-weeds (*Sargassum* and *Fucus*) or other floating objects, but are capable of swimming about free. The most common species is *Idotea robusta*, which is a particularly oceanic species, remarkable for its metallic luster and bluish color. The commonest Amphipods are *Themisto bispinosa*, which often occur in vast numbers, both at the surface and in the trawl-wings, and *Calliopius læviusculus*, which is very common and often abundant at the surface. There are also several species of *Hyperia* and allied genera that live parasitic on jelly-fishes.

The most interesting and beautiful Amphipod is a species of *Phronima* (fig. 163). It is almost transparent and colorless, with the exception of the black eyes. It is about an inch long and lives in a transparent, gelatinous, tubular case or dwelling, which is open at both ends, and usually about an inch in length and nearly as much in diameter. By forcing a current of water through this tube it swims about with considerable rapidity. Clusters of pinkish young ones are often seen attached to the inside of the case. The curious structures or cases inhabited by this species are not all alike, some being smooth and others longitudinally ribbed or keeled, the ribs having serrated edges. The ribbed cases are evidently made from the posterior half of the test of a large *Salpa*, common in the same waters, and having the same serrated ribs. Perhaps the smooth ones are made from other species of *Salpa* and *Doliolum*. Among the surface crustacea are delicate species of the curious genus *Lucifer* (*L. typus?*). Among the common small shrimp are *Latreutes ensiferus*, which is very abundant, and *Leander tenuicornis*, of somewhat larger size. The Schizopod shrimp, *Nyctiphanes Norvegica*,* is often taken in the trawl-wings with several other related species. Sometimes it is very abundant at the surface, especially northward.

Two species of free-swimming oceanic crabs (*Nautilograpsus minutus* and *Neptunus Sayi*) are of common occurrence, usually clinging to the clusters of floating sea-weeds, which they imitate in colors, but swimming rapidly away when disturbed. The young of various crabs in the zoëa and megalops stages are taken in the surface nets, as well as the curious larval forms of *Palinurus*, *Squilla*, and allied genera.

Several oceanic barnacles, especially *Lepas pectinata* and *L. fascicularis*, occur attached to floating drift-wood and other objects, and in one case a small barnacle of this group occurred attached to a living siphonophorous jelly-fish (*Porpita*). Several oceanic annelida were taken, while larval forms of annelids are not uncommon. Among the latter was a very large larva, probably of *Chætopterus*, but much larger than that of the shore species. The larval forms of Echinoderms are not uncommon.

* Prof. G. O. Sars refers this species to a new genus (*Nyctiphanes*) recently established by him. It is the *Thysanopoda Norvegica* Krüyer

The oceanic mollusca are numerous in the Gulf Stream, even as far north as our explorations extended, though doubtless far less abundant than farther south. More than twenty-five species of Pteropods occur living in the region explored, and many of them were taken in the surface nets, though other species were caught only in the trawl-wings, which they probably entered, in most cases, when the trawl was at or near the surface. Most of these Pteropods are very delicate and beautiful forms, with glassy or amber-like transparent shells of various shapes. Those taken in 1883 are all enumerated in the general list of mollusca (p. 70).

At least a dozen species of the curious Heteropods have also been taken by us in the same region. The most abundant of these are the flat, spiral, glassy, and broadly-keeled shells of several species of *Atlanta* (figs. 110, 111). Two transparent naked species, belonging to *Firola* (fig. 112) and *Firoloides* are not uncommon, and *Carinaria*, with its glassy, slipper-like shell, is sometimes taken. Several species of naked mollusks (Nudibranchiata) also occur in the same region. One of the largest and most frequent of these is the *Scyllæa Edwardsii* V. (fig. 109), which clings to the floating fucus and sargassum, and imitates in a marvelous manner the colors, forms, and ornamentation of these sea-weeds. Another large and interesting species (*Fiona nobilis*) has been found several times among the brown and yellow stems of barnacles (*Lepas*) attached to floating timber. It deposits its eggs in inverted cup-shaped, or funnel-shaped, clusters, attached by a little pedicel at the small end.

A very curious and beautiful free-swimming species (*Glaucus margaritaceus*, figs. 113, *a*, *b*) was taken in 1884. It is bright blue and silvery in life.

Some of the species of Cephalopods are taken alive at the surface, but most of them are difficult to capture. One living specimen of the paper-nautilus (*Argonauta argo*, figs. 63, *a*, *b*) was caught in 1882 in a hand-net by Dr. Kite, on the "Fish Hawk." The most abundant Gulf Stream species is *Sthenoteuthis Bartramii*, known as the "flying squid," because it sometimes shoots out of the water with such force as to fall upon the decks of vessels. Very large specimens of this were caught off Cape Hatteras at the surface, and during the last season (1884) they were taken in large numbers and of large size off Martha's Vineyard by jigging them with hooks after attracting them to the side of the steamer by an electric light lowered to the surface of the water. It was not previously known north of Cape Hatteras. A small squid, furnished with sharp claws on its long arms (*Onychia agilis* V.), was also taken at the surface last summer. Many dead and more or less mutilated examples of the great, gelatinous, Octopus-like *Alloposus mollis* V. were several times observed floating at the surface, and sometimes also large specimens of a curious squid (*Calliteuthis reversa* V.). Both of these are probably true deep-sea species, which only rise to the surface when dead or disabled.

The various pieces of drift timber found floating in the Gulf Stream have always been found filled with the burrows of a large species of *Teredo* (*T. megotara*, fig. 127), which seems to be the only common species in that region.

Among the most abundant forms of pelagic life are several species of *Salpa*. One of these is the common species of the New England coast (*Salpa Caboti*, figs. 147, *a*), which grows to be only about an inch long, in the solitary form, but it often occurs in vast quantities, completely filling the sea, so that surface nets are quickly filled and clogged up with it. In this there are delicate reticulations of clear blue lines on the edges of the mantle, gills, and other internal organs, and the nucleus is usually deeply tinged with blue.

A much larger species, which is also very abundant on most trips, often grows in the solitary form to the length of 3 to 4 inches or more, with a diameter of 1 to 1.25 inches, while the chained individuals are sometimes even longer, with each end running out into a long, tapering, acute tip, while both ends are abruptly terminated in the solitary individuals. The body has eight longitudinal angles or keels, serrated along their edges. The chains often become several feet long, but easily break up when disturbed. This species (figs. 148–150) is related to *S. maxima* Forskal, but is apparently distinct. It is, however, probably identical with *S. clostra*, M. Edwards, of the Mediterranean, well figured in the illustrated edition of Cuvier (Plate 121, figs. 2–2*d*).

In this the whole body is nearly colorless, except the nucleus, which is dull orange or orange-brown, but whitish on the sides. On many occasions a bushel or more of this species has been caught in the trawl, evidently from near the surface. In the summer of 1884, this species was taken in Vineyard Sound and Buzzard's Bay, August 25 to September 5, in considerable numbers, but not so large as those found in the Gulf Stream. This must be an unusual occurrence, however. A special collection of this species was made in 1882, by hardening in chromic acid, to be used by Professor Brooks for making sections in studying its anatomy and embryology, and were found by him very satisfactory.

Another very interesting species (*S. pinnata*), previously known from the Mediterranean, was taken in 1883, off Cape Hatteras. In this species the chained individuals are united together in such a way as to form circular or wreath-like groups. Species of *Doliolum* (fig. 146) and of *Appendicularia* were also taken, but have not been studied with care.

Large specimens of *Pyrosoma* have also been taken on several occasions. Some of these were 15 to 18 inches long, and nearly 2 inches in diameter at the larger end, tapering gradually to the small end.

The floating masses of sea-weeds (*Sargassum* and *Fucus*) are nearly always covered with various species of Hydroids and Bryozoa. Among the latter is an encrusting species which covers the fronds and bladders with a delicate calcareous network, and when the *Sargassum* is dried

the bladders often shrink away and leave the encrusting Bryozoa in the form of very elegant hollow balls. Among the Hydroids the most abundant are *Obelia geniculata* and several small species of *Aglaophenia*.

The jelly fishes are very abundant and very interesting in the Gulf Stream water. Among the most common and conspicuous is the "Portuguese man-of-war" (*Physalia arethusa*), remarkable for its curious form and habits, as well as for its brilliant blue and crimson colors and its virulent stinging powers. Related to this, and not less beautiful, is the *Porpita Linnæana*, which has a very beautiful, circular, radiated, pinkish floating disk, bordered with bright blue, while the delicate zooids hanging from its lower surface form an elegant blue and green fringe around it. This has been taken several times, but the best lot was obtained at station 2039. Specimens of the allied form (*Velella mutica*), which is beautifully varied with blue, green, and pink, and has a thin oblong disk, with an oblique, diagonal crest or sail, were taken, but they were not full grown. Several other species of Siphonophores were obtained, among which were *Gleba hippopus* and a species of *Cuboides*. Of the medusæ, *Pelagia cyanella*, *Stomolophus meleagris*, *Periphylla hyacinthina*, *Trachynema digitale*, *Calycopsis typa* Fewkes, and a large species of *Zygodactyla* were among the most prominent.

A large and conspicuous medusa, with distant, stout, and rather stiff-looking tentacles, and broad, deep marginal lobes, was taken in several localities. (Stations 2034, 2037, 2039, 2040, 2045, 2079, 2104.) It grows to be over 6 inches in diameter, and the stomach and genital organs have a deep purplish brown color when recently placed in alcohol, but its color in life was not noted. Mr. Fewkes considers this a new species of the rare genus, *Atolla* (*A. Verrillii*). The specimens of *Stomolophus meleagris* were large and handsome. According to the observations of Mr. William Nye, jr., on the "Albatross," the disk in this species contracted, when first taken, 102 times per minute. It was taken near stations 2085 and 2088.

Among the most abundant and characteristic of the forms of pelagic life are the curious, transparent-finned worms belonging to the genus *Sagitta* (figs. 196, *a*). These have a well-marked head with two eyes, and with broad groups of sharp, curved spines on each side of the head, while there is a well-developed caudal fin, like that of a fish in form, and other fins on the sides of the body. They swim through the water with great rapidity and are so transparent that they are not easily seen. They are usually taken in large numbers in our surface nets, of all sizes, from a small fraction of an inch up to 2 or 3 inches in length. Probably there are several species among them. They are equally abundant in the trawl-wings from all depths, and among those that have been taken only in the trawl-wings there is one large species, nearly 3 inches long, which is deep salmon or orange in color, while the surface species are colorless.

A very different but equally transparent worm (*Tomopteris*) is also frequently taken. In this genus there are bilobed swimming-feet along

each side, with a pair of long curved appendages on the sides of the head. Some singular forms of Turbellarian worms have also been taken, one of which is about 2 inches long, and flat, with a pair of long lateral appendages extending back from the head. Its color in life was orange.

The Protozoa are also well represented by various species of Radiolaria and Foraminifera. Among the latter are several small species of *Globigerina* and allied genera that are nearly always taken in the surface nets, and the shells of these are also among the most abundant of those that constitute the "Globigerina ooze" of the bottom.

It is certain that all this vast assemblage of surface-life must be constantly dying and sinking to the bottom, thus furnishing food for the numerous inhabitants of the deep sea, directly or indirectly. Although these soft-bodied creatures would quickly decay in water so warm as the surface of the Gulf Stream, it is necessary to remember that at the depth of less than 150 fathoms the temperature falls to about 40° F., so that decomposition would go on very slowly after they had fallen to that depth. However, it is probable that such creatures begin to sink into the cold depths as soon as they are injured or weakened in any way, and thus they would reach the cold zone before life is extinct. In fact it may be that the cold itself in most cases is the actual or immediate cause of the death of those weakened or partially disabled creatures that are unable to keep their places at the surface. As a matter of fact, I have taken from the stomachs of bottom-dwelling creatures, like Actiniæ and star-fishes, various surface animals, including *Salpa* and *Lepas*, which showed no signs of decomposition. Yet it is estimated that it would take several days for such things to sink to the bottom in 2,000 fathoms.

Hitherto we have not met with small forms of plant life in the Gulf Stream in any abundance. The microscopic plant life seems to be much less abundant there than near the coast. In fact, the small amount of such organisms hitherto observed seems to indicate that the vast numbers of the small forms of animal life cannot depend mainly upon plants for their primary food-supply, and renders it more than probable that many of the Protozoa, at least, are capable of deriving their food directly from inorganic matter to a large extent, if not entirely. It is not necessary to believe that this power is restricted to the vegetable kingdom, but this question needs farther investigation.

PRELIMINARY LIST OF ACALEPHÆ COLLECTED BY THE "ALBATROSS" IN 1883 IN THE REGION OF THE GULF STREAM.

By J. W. Fewkes.

The following list includes nearly all the species obtained in 1883, with the exception of various minute hydroid gonophores, which have not yet been studied, and a few species too imperfectly preserved for

identification. A few species obtained in 1884 are also included in the list.*

Atolla Verrillii Fewkes, sp. nov.

The genus *Atolla* was described by Hæckel in his report on the deep-sea medusæ of the "Challenger," from the Antarctic Ocean, between the Kerguelen Islands and Melbourne, and from St. Mathias Bay, Patagonia.

Our species was collected in the following localities:

Station.	Locality— N. lat.	W. long.	Depth.
	° ′ ″	° ′ ″	*Fathoms.*
2034	39 27 10	69 56 20	1,346
2037	38 58 30	69 23 30	1,731
2039	38 19 26	68 20 20	2,369
2040	38 35 13	68 16 00	2,226
2042	39 33 00	68 26 45	1,555
2044	40 00 50	68 37 20	1,067
2045	40 04 20	68 43 50	373
2094	39 44 30	71 04 00	1,022

The genus is represented by eight specimens, three of which are over 45^{mm} in diameter. The "Challenger" collected five specimens. Our species is very closely related to the Antarctic one, *A. Wyvillii* Hæck. The depth recorded for *A. Wyvillii* is 1,950 and 2,040 fathoms. Our species ranges from 373 to 2,369 fathoms. My largest specimen, a little over 45^{mm} in diameter, although smaller than Hæckel's largest (66^{mm}) has twenty eight tentacles, marginal sense-bodies, and marginal lobes before bifurcation, while his has but twenty-two.

Nauphantopsis Diomedeæ, gen. et sp. nov.

A new genus, *Nauphantopsis*, one of the most important collected by the "Albatross," resembles *Nauphanta* in the sculpturing of the exumbrella, but while the latter has sixteen marginal lappets, *Nauphantopsis* has thirty-two; *Nauphantopsis* has thirty-two deep furrows across the corona; *Nauphanta* has sixteen deep and sixteen shallow coronal incisions; *Nauphantopsis* has twenty-four tentacles and eight sense-bodies, which are very imperfect. *Nauphanta* has eight tentacles and eight sense-bodies. Three tentacles are therefore side by side on the rim of the former, alternating with the sense-bodies. The single specimen was found at station 2038, in latitude 38° 30′ 30″ N. and longitude 69° 08′ 25″ W., in a depth of 2,033 fathoms.

This genus is morphologically one of the most valuable of the collection, and, like *Nauphanta*, probably belongs to the deep-sea fauna. It connects the family of Collaspidæ, of which *Atolla* is one of two mem-

* In most cases it is impossible to say whether the novel forms of medusæ taken in the trawl and trawl-wings are inhabitants of the bottom waters or the surface, or of intermediate depths. Eventually those that belong to the surface-fauna will doubtless be taken in the surface-nets, but this will require much more extensive collecting of the surface animals than has yet been attempted. A. E. V.

bers, with the Periphyllidæ. Its coronal furrow and sculpturing of the exumbrella recalls the former family, and the arrangement of the tentacles in threes and other features, the latter. Hæckel rightly says of *Nauphanta* that, like *Atolla*, "it is a true deep-sea form of high phylogenetic antiquity." The allied *Nauphantopsis* supports Hæckel's interpretation of the relationship of the Peromedusæ and the Collaspidæ.

Ephyroides rotaformis Fewkes, gen. et sp. nov.

A new genus, *Ephyroides*, has rounded elevations, from sixteen to thirty-two in number, on the exumbral side of the corona of the bell. It is a member of the Ephyridæ of Hæckel, and occurs at the following stations:

Station.	Locality— N. lat.	W. long.	Depth.
	° ′ ″	° ′ ″	*Fathoms.*
2042	39 33 00	68 26 45	1,555
2044	40 00 30	68 37 20	1,067
2051	39 41 00	69 20 20	1,106
2047	40 02 30	68 49 40	889

Periphylla hyacinthina Steenstrup.

The Periphyllidæ are represented by a fine suite of specimens of the medusa, *Periphylla hyacinthina* Steenstrup, and another species which may turn out to be a new genus closely allied to the latter. From these medusæ, of which there are fifteen specimens, I shall be able to study at length the development of the genus *Periphylla*, of which at present nothing is known.

Halicreas minimum Fewkes.

In 1880-'81 the "Albatross" collected a strange medusa, to which was given (Bull. Mus. Comp. Zool., vol. ix, No. 8) the name *Halicreas minimum* Fewkes. In the present collection this genus is represented by several specimens. The genus is a marked one, by the possession of eight prominences on the margin of the umbrella, from which radial ribs extend toward the center of the disk. These radial prominences bear two or more rows of small rounded tubercles. The velum is similar to that of *Solmaris*, *Cunina* and certain Narcomedusæ. It has eight rounded knobs on the subumbral surface of the disk, as in the young *Zygodactyla Grœnlandica*. The specimens of this genus in the collection will enable me to make out a good anatomy of this extraordinary medusa. They come from the following stations:

Station.	Locality— N. lat.	W. long.	Depth.
	° ′ ″	° ′ ″	*Fathoms.*
2034	39 27 10	69 56 20	1,346
2036	38 52 40	69 24 40	1,735
2039	38 19 26	68 20 20	2,369
2041	39 22 50	68 25 00	1,608
2042	39 33 00	68 26 45	1,555
2216	39 47 00	70 30 30	963

Halicreas is the type of a new family of medusæ, the Halicreasidæ, which stands intermediate between the Narcomedusæ and the Acraspeda.

Among the smaller medusæ there are many Campanellidæ.

Solmaris incisa, sp. nov.

A giant *Solmaris* (50–60^{mm} in diameter) of a new species (*S. incisa*) is represented by three specimens from the following stations:

Station.	Locality— N. lat.	W. long.	Depth.
	° ′ ″	° ′ ″	*Fathoms.*
2094	39 44 30	71 04 00	1,022
2104	38 48 00	72 40 30	991

This species has thirty-two radial pits or furrows on the subumbral side of the disk. These indentations are confined to the corona.

HYDROIDA.

The hydroid gonophores are very numerous, and there are species of *Zygodactyla*, sp. nov., and *Mesonema*, *Staurophora laciniata* Ag., *Turris episcopalis* Fewkes, several Oceanidæ, and one or two minute genera which have not been satisfactorily examined.

The collection also contains specimens of *Porpita Linnæana* Less., *Velella mutica* Bosc, and *Rataria* (young *Velella?*). There is a single *Agalma* nectocalyx, a large *Gleba*, and fragments of Agalmidæ. *Cuboides* and *Sphenoides* were found for the first time in the Gulf Stream.

The indications are that there are several genera and species of Rhizophysidæ in the Gulf Stream. The collection contains fragments of three or four undetermined species, besides two species which could be identified. There is also a new genus of Rhizophysidæ in the collection. A new species of *Rhizophysa* is allied to *R. inermis* of Studer. In this species there are no tentacles, and the polypites and sexual organs arise in clusters at intervals on the axis, as in *Apolemia*. The float of another unknown *Rhizophysa* is 15^{mm} in shorter, 30^{mm} in longer diameter, *in alcohol*. This is the largest *Rhizophysa* float ever recorded. A short section of the stem of this giant still remains with the float, but the remainder, with its appendages, is broken and lost, so that identification is impossible.

Pterophysa grandis, gen. et sp. nov.

A magnificent new genus of Rhizophysidæ, which will be described under the name *Pterophysa*, is one of the most important additions made by the "Albatross" to our Medusan fauna. This genus has two lateral muscular wings on the polypites and no tentacles. The sides of the polypites are specialized into grasping organs, which, in conjunction with the lateral folds, convert these organs into suckers, by which

the animal clings to a foreign body. This specialization may also serve for the capture of prey, since *Pterophysa* has no tentacles for that purpose. The genus was found clinging to the "dredge rope" at station 2227. Collected in 1884.

Angelopsis globosa, gen. et sp. nov.

Lesson, in his "Histoire des Zoophytes Acalephes," figures and describes an interesting medusa, discovered by Rang, to which he gave the name *Angela*. This genus lies between *Physalia* and other Physophores, and, filling that gap, is of greatest interest. Unfortunately, since the original description by Lesson, *Angela* has never been rediscovered. The collection of the "Albatross" contains a Physophore closely allied to *Angela*, to which the name *Angelopsis* seems appropriate. There are two specimens of *Angelopsis* from station 2105, in latitude 37° 50′ 00″, N., longitude 73° 03′ 50″ W., in a depth of 1,395 fathoms. *Angelopsis* is intermediate in structure between *Rhizophysa* and *Physalia*, and in my judgment shows that Dr. Chun is right in separating these genera from the other Physophores with which they have so little in common.

Pelagia cyanella Per. et Less., *Stomolophus meleagris* Ag., *Aurelia flavidula* Per. et Les., and an unknown Aurelian are found in the collection. There are two specimens of the latter, which is probably a new genus.

In this brief enumeration I have simply made mention or touched upon the salient features of my new genera, without entering upon the many morphological considerations which such unusual forms suggest. I have not enumerated the new species of hydroid gonophores, since at this stage of my research it would be impossible for me to rightly estimate, in the case of most of them, whether their characters are generic or specific. From the nature of the case these small, almost microscopic, medusæ require a longer time for identification. The whole collection confirms a fact which every student of marine zoology who has collected in the Gulf Stream has long known, that these waters teem with a medusan life, of which only a small fraction has yet been described.

The following list contains the majority of the Medusæ sent to me. Several doubtful species are omitted. The majority of the latter are hydroid gonophores of small size and doubtful affinities.

ACRASPEDA.

Atolla Verrillii, sp. nov.
Aurelia flavidula Per. et Less.
Ephyroides rotaformis, gen. et sp. nov.
Nauphantopsis Diomedeæ, gen. et sp. nov.
Periphylla hyacinthina Steenstrup.
Periphylla, sp. nov., forsitan gen. nov.
Stomolophus meleagris Ag.
Aurelia, incertæ sedis.

TRACHYMEDUSÆ.

Campanella, sp. nov.
Halicreas minimum Fewkes.
Solmaris incisa, sp. nov.

SIPHONOPHORA.

Physalia Arethusa Til. Common.
Rhizophysa uvaria, sp. nov.
Rhizophysa, sp.?
Pterophysa grandis, gen. et sp. nov.
Angelopsis globosa, gen. et sp. nov.
Agalma, sp.?
Cuboides, sp.?
Sphenoides, sp.?
Gleba hippopus Forsk.

DISCOIDEA.

Porpita Linnœana Less.
Rataria (*Velella* young?).
Velella mutica Bosc.

HYDROIDA.

Mesonema, sp. nov.
Zygodactyla, sp. nov. Common.
Zygodactyla, sp. nov.
Turris episcopalis Fewkes.
Staurophora laciniata Ag.
Oceanidæ, incertæ sedis.

LIST OF ADDITIONAL GULF STREAM ACALEPHS COLLECTED IN 1880 AND 1881.

The following species were recorded by Mr. Fewkes in his former paper:*

CTENOPHORA.

Beroë, sp.
Station 920, 1881.

DISCOPHORA.

Periphylla hyacinthina Steenstrup.
Stations 936, 952, 954, 995, 1881.

SIPHONOPHORA.

Apolemia, sp.
Off Block Island, 1880.

* On the Acalephæ of the east coast of New England; II Acalephæ collected by the United States Fish Commission during the summer of 1880 and 1881. (Bulletin Museum Comp. Zool., vol. ix, p. 300, 1880.)

Agalma elegans Fewkes.
Gulf Stream, 1880.

Haliphyta magnifica Fewkes.
Station 953, 1881.

Diphyes, sp.
Gulf Stream, 1880.

HYDROIDA.

Trachynema digitale A. Ag.
Stations 985, 1026, 1881.

Calycopsis typa Fewkes.
Station 870, 1880; and stations 924, 945, 952, 1881.

Chromatonema rubrum Fewkes.
Stations 936, 954, 1881.

Halicreas minimum Fewkes.
Stations 954, 1029, 1881.