AXINOPSIS CORDATA, new species.

(Plate XCVII, figs. 5, 6.)

Shell small, white, smoothish, rounded or somewhat cordate, longer anteriorly, with small, little prominent beaks curving forward. Antero-dorsal margin a little convex, sloping gradually and passing somewhat abruptly into the anterior margin, which is broadly and obtusely rounded; ventral margin strongly convex, somewhat produced in the middle; posterior margin pretty evenly rounded, except in the middle, where there is a slightly produced portion corresponding to the plication; postero-dorsal margin strongly convex in the middle. The surface is marked by fine, microscopic, concentric striæ and irregular lines of growth which, on the umbo, appear as slight undulations. The ligamental area is relatively large, prominent in the middle, and defined by a distinct groove, beyond which there is a well-marked but low radiating ridge or plication which forms an inconspicuous projection at the margin; anterior to this there is a very slight wave-like depression of the surface, much as in most species of *Cryptodon*. The hinge-margin is decidedly thickened; in both valves there is a rather large, obtuse tooth just below the beak, from which it is separated by a rather large space for the ligament which runs backward for a short distance in a conspicuous submarginal groove, becoming internal distally; anteriorly the groove is narrow and outside the margin.

Length, about 2 mm.; height, the same.

This species is referred to the genus *Axinopsis* with some doubt, although it has the distinct cardinal tooth and ligament-groove. It has, however, a single posterior plication similar to that seen in some species of *Cryptodon;* but the character of the plications vary in that genus, in some cases being very strong and in others obsolete, or nearly so. In fact, the genus *Axinopsis* can hardly be distinguished from it except by the distinctly developed cardinal tooth, which is only partially differentiated from the proximal end of the anterior hinge-plate.

A few separate valves and two live young were found at six stations between N. lat. 40°, W. long. 71° 14′ 30″, and N. lat. 35° 42′, W. long. 74° 54′ 30″, in 43 to 202 fathoms, 1880–1884.

The young specimens from stations 870 and 943 are referred to this species with considerable doubt, as they have a much more rounded outline, although the hinge-margin is similar.

AXINODON, new genus.

Type.—Axinodon ellipticus, new species.

Shell thin, rounded or ovate, without plications. Hinge with one or two small or subrudimentary teeth. Ligament internymphal, posteriorly so far internal that its inner end, distally, is attached below the inner edge of the hinge-plate, and therefore covers its entire breadth.

AXINODON ELLIPTICUS, new species.

(Plates XC, figs. 5, 6; XCII, fig. 1.)

Shell small, nearly smooth, swollen, transversely elliptical and somewhat oblong, with rather prominent umbos and with the beaks considerably behind the middle and curved forward. The antero-dorsal margin is decidedly convex and somewhat excurved, the anterior end is longer and a little broader than the posterior; both are nearly evenly rounded; the ventral margin is broadly rounded and nearly straight for a short distance along the middle; the postero-dorsal margin is convex and merges into the posterior end in a regular curve. The lunular area is rather distinct, but without any very definite boundary. The surface is nearly smooth, covered only with fine, close lines of growth, which, under the microscope, appear as delicate, raised lines, separated by grooves of about the same width; this sculpture is very regular over most of the surface, but on the umbos some of the ridges are so large as to appear like small undulations. The interior surface is smooth and white; the muscular scars are indistinct; the hinge-margin is rather thin; the posterior ligament is prominent, wedge-shaped, widest distally, and occupies a distinct groove covering the whole breadth and extending about one-third the length of the postero-dorsal margin and running forward under the beaks. In the left valve there are two slightly raised, minute, obscure, rounded teeth under the beak, of which the anterior is a little more distinct than the other; farther forward, and separated from the latter by a slight notch, there is an elongated thickening of the margin forming a sort of lateral tooth or lamina and separated from the outer edge by a narrow groove. In the right valve the anterior tooth-like thickening is less distinct and there is only a very slight rounded swelling of the lunular margin under the beak.

Length, 3.5 mm.; height, 3 mm.

Two live specimens (No. 35175), station 2096, N. lat. 39° 22′ 20″, W. long. 70° 52′ 20″, in 1,451 fathoms, 1883.

LEPTAXINUS, new genus.

Type.—Leptaxinus minutus, new species.

Shell small, short-ovate, inequilateral, with the anterior end the longer, and rounded, and the posterior end tapered and angulated, with a slight plication. Hinge-plate well developed, with a delicate, lateral tooth on both sides of the beak in the right valve, and one posterior lateral tooth in the left valve; in both valves with the proximal end of the hinge-plate enlarged and thickened near the beak, that of the left valve most developed and rising into a blunt tooth-like prominence. Ligament commencing under the beak and running back on the ventral side of the posterior hinge-plate, so that for the greater part of its length it is internal.

This genus differs from *Cryptodon* in the more internal position of the ligament and in having distinct lateral teeth. From *Axinodon*, in the stronger hinge-plate, in the presence of the lateral teeth, in having a posterior plication, and in lacking distinct cardinal teeth.

LEPTAXINUS MINUTUS, new species.

(Plate LXXXIX, figs. 3–5.)

Shell minute, broadly ovate, with a slightly produced obtuse point near the middle of the posterior end, and a somewhat produced, broadly rounded anterior end. Beaks behind the middle, rising a little above the dorsal margin and turned forward, leaving a small, rather deep lunular area. Antero-dorsal margin a little convex, sloping but little; anterior margin broadly and evenly rounded, forming nearly a semicircle, and passing continuously into the ventral margin, which is a little more broadly rounded; the posterior margin is somewhat angular, with a distinct prominence a little below the middle, where the radial ridge terminates, below this for a short space the margin is nearly straight or slightly incurved; above, the postero-dorsal margin is straight as far as a slight angle in the ligamental area, above which it is convex to the beak. The hinge-margin is a little thickened, and in the left valve forms a rather prominent and somewhat angular tooth just below and slightly in front of the beak; the ligamental groove is barely visible on the inner face of the posterior hinge-margin, and runs forward as a narrow groove beneath the beak; in the right valve there is a somewhat less prominent tooth just under the beak, behind which the ligamental groove forms a distinct notch in the margin. Under the microscope there is seen in both valves a distinct submarginal ridge with a conspicuous groove behind it, commencing a considerable distance behind the beak and running in and along the inner hinge-margin; there is also in the right valve a short, indistinct groove along the end of the hinge-margin in front of the beak. Externally a rather shallow, depressed undulation runs from the beak to the postero-ventral margin; behind it is a narrow, but slightly prominent, radial ridge running to the posterior angle; back of or above this a rather short ligamental area projects beyond the margin. The surface is covered with a thin, greenish yellow epidermis and is marked by fine, pretty regular, parallel, raised lines of growth, and also faint and rather numerous radiating lines which are not visible except under a high power.

Length, nearly 2 mm.; height, $1\frac{3}{4}$ mm.

One live specimen (No. 45686), station 949, N. lat. 40° 3′, W. long. 70° 31′, in 100 fathoms, 1881.

Family ASTARTIDÆ.

ASTARTE NANA (Jeffreys?) Dall.

Astarte nana DALL, Bull. Mus. Comp. Zoöl., XII, p. 261, pl. VII, figs. 6*a*, 6*b*, 1886; Bull. U. S. Nat. Mus., No. 37, p. 46, pl. VII, figs. 6*a*, 6*b*, 1889.

A single valve, which agrees perfectly with Dall's figures, quoted above, was found at station 2307, off Cape Hatteras, North Carolina, in 43 fathoms, 1884. South to Sombrero, in 22 to 196 fathoms.—Dall.

Family CUSPIDARIDÆ.

In the classification of this family we have adopted the groups proposed by Messrs. W. H. Dall and E. A. Smith as defined by Mr. Dall.[1] We, however, consider his two subgeneric groups, *Cardiomya* and *Halonympha*, as distinct genera.

CUSPIDARIA UNDATA Verrill.

(Plates LXXII, fig. 1; LXXVIII, figs. 3, 4.)

Neæra undata VERRILL, Trans. Conn. Acad., VI, pp. 223, 277, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 574, 1885.

Not *Myonera undata* DALL, Bull. Mus. Comp. Zoöl., XII, pp. 302, 304, 1886; Bull. U. S. Nat. Mus., No. 37, p. 68, 1889 (in part).

Three live specimens and two valves were found at stations 2098 and 2566, off Chesapeake Bay, in 2,221 and 2,680 fathoms, 1883 and 1885.

Fragments obtained by the *Blake* near Havana, Dominica, and St. Vincent, in 450 to 611 fathoms, are erroneously referred by Mr. Dall to this species. Our shell is certainly not a *Myonera*.

We have a fragment of a left valve from station 2655, N. lat. 27° 22′, W. long. 78° 7′ 30″, in 338 fathoms, found among Foraminifera, which belongs to a strongly undulated species, with a short, angular, subacute rostrum defined below by a rather deep groove at which the concentric sculpture changes abruptly. The beak is prominent and turns strongly backward. The cartilage-plate is strong, deeply concave, and directed backward; a moderately elevated internal rib runs backward from the umbonal region to the posterior muscular scar. The shell is thin and has deep internal grooves corresponding to the external ridges. Judging by the lines of growth, the shell was short-ovate, broadly rounded anteriorly, and having posteriorly a short, angular, subacute rostrum; the escutcheon is concave and well-defined by a small, sharp ridge. This fragment seems to belong to an undescribed species of *Myonera*. It can, however, hardly be the same as Mr. Dall's species, as he states that in his "there is no buttress or appearance of an internal rib."

[1] Bull. Mus. Comp. Zoöl., XII, p. 292, 1886; XVIII, p. 441, 1889.

CUSPIDARIA LAMELLOSA (M. Sars) Dall.

(Plate LXXIV, fig. 10.)

Neæra lamellosa VERRILL, Trans. Conn. Acad., V, p. 561, 1882; VI, p. 277, pl. XXX, fig. 3, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 574, 1885.

Cuspidaria lamellosa DALL, Bull. Mus. Comp. Zoöl., XII, p. 294, 1886; Bull. U. S. Nat. Mus., No. 37, p. 66, pl. XLV, fig. 3, 1889.

Comparatively few specimens, at twelve stations, between N. lat. 40° 2′ 49″, W. long. 68° 49′, and N. lat. 37° 59′ 30″, W. long. 73° 48′ 40″, in 319 to 555 fathoms, 1880–1886.

A few specimens occurred which differ from the typical form in having but five or six concentric lamellæ visible on the antero-ventral portion of each valve and only conspicuous unequal lines of growth on the rest of the surface.

CUSPIDARIA TURGIDA, new species.

(Plates LXXII, fig. 7; LXXVII, fig. 4.)

Shell rather large, thin, delicate, translucent, of a pinkish white color within, long-oval, with prominent, posteriorly directed umbos, and narrow, rather long posterior rostrum. The beaks are central, rather acute and turned distinctly forward. The antero-dorsal margin is slightly convex, forming a broad curve; the anterior end is a little prolonged in the middle but otherwise pretty evenly rounded; the ventral margin forms a regular, broad curve becoming strongly incurved at the base of the rostrum; the postero-dorsal margin is straight at first, but slightly concave along the rostrum. The cartilage-plate is small and very oblique, and in the right valve, is separated by a distinct notch from the lateral tooth, which is long and low, with a rounded summit and a long, gradual, posterior slope; there is no trace of buttress or clavicle. In the left valve the hinge-margin is thin, and nearly simple both anteriorly and posteriorly. The exterior surface is covered with a thin, yellowish gray epidermis and is marked with irregular, rather conspicuous lines of growth; on the rostrum there is a distinct diagonal ridge running from the beaks to the lower margin.

Length, 22 mm.; height, 12 mm.; breadth, 11 mm.; distance from center of beak to end of rostrum, 12 mm.; to extreme anterior end, 12 mm.

In form, general appearance, and length of rostrum, this species is intermediate between *C. glacialis* and *C. rostrata*, but the umbos are more oblique and there are obvious differences in the hinge.

One live specimen (No. 78789), station 2714, N. lat. 38° 22′, W. long. 70° 17′ 30″, in 1,825 fathoms, 1886.

CUSPIDARIA ROSTRATA (Spengler) Dall.

(Plate LXXII, fig. 6.)

Neæra rostrata VERRILL, Trans. Conn. Acad., V, p. 562, pl. LVIII, fig. 39, 1882; VI, p. 277, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 574, 1885.—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XII, p. 35, 1885.

Cuspidaria rostrata DALL, Bull. Mus. Comp. Zoöl., XII, p. 294, 1886; XVIII, p. 444, 1889; Bull. U. S. Nat. Mus., No. 37, p. 66, 1889.—LOCARD, Campagne du *Caudan*, Annales de l'Université de Lyon, p. 177, 1896.

This species was obtained at about fifteen stations between N. lat. 40° 6′ 50″, W. long. 70° 34′ 15″, and N. lat. 38° 31′, W. long. 73° 21′, in 65 to 156 fathoms. South to Barbados in 65 to 1,639 fathoms.—Dall.

CUSPIDARIA GLACIALIS (G. O. Sars) Dall.

(Plates LXXI, fig. 9; LXXIII, fig. 5; LXXV, fig. 9.)

Neæra glacialis G. O. SARS, Mollusca Reg. Arcticæ Norvegiæ, p. 88, pl. 6, figs. 8, *a–c*, 1878.—VERRILL, Trans. Conn. Acad., V, p. 562, pl. XLIV, figs. 10, *a–b*, 1882; VI, p. 277, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 574, 1885.—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XIII, p. 35, 1885.

Cuspidaria glacialis DALL, Bull. Mus. Comp. Zoöl., XII, pp. 294, 303, 1886; Bull. U. S. Nat. Mu , No. 37, p. 66, 1889.

Cuspidaria arctica var. *glacialis* DALL, Bull. Mus. Comp. Zoöl., XVIII, p. 444, 1889; Proc. U. S. Nat. Mus., XII, p. 280, 1889.

Cuspidaria glacialis BUSH, Bull. Mus. Comp. Zoöl., XXIII, p. 226, 1893.

Not *Cuspidaria artica* (M. SARS).

This very common species was dredged at many stations from N. lat. 44° 26′, W. long. 62° 10′, to N. lat. 37° 8′, W. long. 74° 33′, in 62 to 828 fathoms. South to the Gulf of Mexico, in 64 to 1,467 fathoms.—Dall.

CUSPIDARIA MEDIA, new species.

(Plates LXXI, figs. 5, 6; LXXIII, fig. 6.)

Shell of moderate size, resembling a medium-sized *C. glacialis* (Sars), in form, but decidedly more swollen, with the rostrum narrower and more distinctly defined by a stronger ventral emargination. Umbos large, prominent, and swollen, with strongly incurved and very prominent beaks. The antero-dorsal margin is a little convex and slopes rapidly to the evenly rounded anterior end; the ventral margin is regularly curved and is rather more convex than in *C. glacialis*, and shows a very decided emargination at the base of the rostrum; the postero-dorsal margin is nearly straight but slopes from the beak to the end of the rostrum which is of moderate length and tapers from the base to the narrow, subtruncated end; it has no distinct diagonal ridge, but is separated from the body of the shell by a strongly marked depression. The surface is nearly smooth but is covered with fine lines of growth

which are most distinct on the rostrum. The hinge-margin is thin. The right valve has a thin, low, much elongated posterior lateral tooth which runs nearly parallel with the dorsal margin, above which it projects in a broad curve; the cartilage-plate is small, very oblique, and closely united with the tooth from which it is separated by a faint, curved notch; no buttress. In the left valve there is no lateral tooth, and the cartilage-plate is very small, slightly prominent, with a curved inner edge. The inner surface of the shell is smooth and the muscular scars are faint.

Length of an average specimen, 13 mm.; height, 8 mm.; breadth, 6.5 mm.; beak to end of rostrum, 8.5 mm.; beak to anterior end, 6 mm.

This species is allied to *C. glacialis*, from which it differs in its more swollen form, more oblique anterior end, more prominent ventral margin, more clearly defined rostrum, and straighter postero-dorsal margin. The hinge shows still more decided differences; the lateral tooth of the latter is stouter, more prominent, and less prolonged; the cartilage-plate is smaller and less distinctly defined. From *C. fraterna* it differs in being less produced ventrally and in having a longer rostrum with much straighter dorsal margin and a much longer lateral tooth.

This is a common species off Marthas Vineyard and has been taken at about fifteen stations between N. lat. 40° 10′ 15″, W. long. 70° 26′, and N. lat. 39° 56′, W. long. 70° 54′ 18″, in 63 to 155 fathoms, 1880–1884. A broken valve, station 362, N. lat. 42° 1′, W. long. 69° 34′, in 106 fathoms, 1879, is also referred to this species.

CUSPIDARIA PARVA, new species.

(Plates LXXIV, fig. 9; LXXVII, fig. 7.)

Shell small, delicate, elongated, inequivalved, having a general resemblance in form to the very young of *C. obesa* and *C. fraterna*. Umbos small, rather prominent; beaks small and incurved. The antero-dorsal margin is moderately convex and slopes regularly to the evenly rounded anterior end; ventral margin very broadly rounded, with a decided incurvature at the base of the rostrum, corresponding to the marked depression of the surface; postero-dorsal margin slopes rapidly at first and is usually concave along the rostrum, which is moderately long (the length varies in different specimens), narrow, with an obtusely rounded or subtruncated end. It is crossed by a distinct diagonal ridge, above which there are several small, raised, radial lines; the surface is elsewhere nearly smooth or presents a microscopic, faintly granulose appearance. The left valve is the larger and considerably overlaps the right along the ventral margin and siphonal region; the right overlaps the left along the postero-dorsal margin; the rostrum is a little bent toward the left in some specimens. The hinge-margin is delicate, with the anterior margin a little everted; cartilage-plate minute, sunken, in the right valve well separated from the prominent,

rather elongated lateral tooth; the left valve also has a small, elongated, tooth-like expansion posterior to the cartilage-plate.

Length, 4.5 mm.; height, 2.25 mm.; breadth, 1.5 mm.

This species may easily be mistaken for the young of *C. obesa* and *C. fraterna;* the structure of the hinge is, however, characteristic.

A comparatively few specimens, at seven station, between N. lat. 41° 28′ 30″, W. long. 65° 35′ 30″, and 35° 49′ 30″, W. long. 74° 34′ 45″, in 515 to 1,290 fathoms, 1883–1886.

CUSPIDARIA VENTRICOSA, new species.

(Plates LXXII, fig. 5; LXXVI, fig. 6.)

Shell large, rather solid, swollen, with a ventral enlargement and a moderately elongated, tapered rostrum. Umbos swollen and prominent; beaks incurved. Antero-dorsal margin at first nearly straight, then broadly rounded with the extreme anterior end a little prominent; ventral margin decidedly excurved in the middle, corresponding to the exterior swelling; at the base of the rostrum slightly concave; postero-dorsal margin somewhat concave, the most so at the base of the rostrum, which is obtusely rounded at the end. Exterior covered with very distinct lines of growth and irregular, stronger, concentric grooves. On the rostrum there is an obtuse, diagonal ridge running to the ventral angle of the tip; between this and the dorsal margin there are two others less distinct. The anterior hinge-margin is decidedly thickened in both valves and projects inward with a thick, rounded edge, most conspicuous in the right valve, in which it is abruptly much narrowed near the cartilage-plate; in this valve the lateral tooth is short, stout, obtuse, very prominent, and situated close to the beak, its length along the margin not much exceeding its height; cartilage-plate small, relatively wide, oblique, directed backward and downward, and closely united to the lateral tooth, there being only a slight, rounded notch between.

Length of the larger specimen, 30 mm.; height, 29 mm.; breadth, 18 mm.; beak to end of rostrum, 16 mm.; beak to anterior end, 17 mm. Another specimen is 25 mm. long; 17 mm. high; 12 mm. broad.

Four valves, at three station, between N. lat. 40° 29′, W. long. 66° 4′, and N. lat. 38° 27′ 30″, W. long. 70° 54′ 30″, in 349 to 1,769 fathoms, 1882–1886.

This species has some resemblance to *C. glacialis*, but is a stouter and more swollen shell, with a relatively larger rostrum, much more elongated and less prominent lateral tooth, and very different cartilage-plate. The latter does not have the swollen ventral region, characteristic of our species, nor the diagonal ribs on the rostrum.

CUSPIDARIA ARCTICA (M. Sars) Dall.

(Plates LXXI, fig. 2; LXXIV, fig. 7.)

Neæra arctica SARS, G. O., Mollusca Reg. Arcticæ Norvegiæ, p. 85, pl. 6, figs. 5, *a–c*, 1878.—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XIII, p. 35, 1885.

Cuspidaria arctica DALL, Bull. Mus. Comp. Zoöl., XII, p. 294, 1886.

Not *Neæra arctica* VERRILL, Amer. Journ. Science, VI, p. 440, 1873.

A single imperfect valve from station 70, south of Halifax, Nova Scotia, in 190 fathoms, is referred to this species. Though worn and slightly broken, it agrees closely with Sars' figure, but it cannot be fully grown, for it measures but 14 mm. in length and 11 mm. in height.

CUSPIDARIA FORMOSA, new species.

(Plates LXXIV, fig. 6; LXXIX, fig. 9.)

Shell short, high, and swollen. Umbos prominent; beaks incurved. Anterior portion broadly rounded, a little produced at the end, with the dorsal margin convex and a little excurved; the ventral margin is broadly and evenly rounded; the rostrum is short, broad at base, much tapered; the postero-dorsal margin is nearly straight at first, then slightly concave and a little upturned. The exterior is covered with uneven lines of growth between which the surface is microscopically striated and more or less iridescent. The color of the single specimen is pale pink, externally and internally. The right valve has a prominent, triangular lateral tooth with its base prolonged parallel to the margin of the shell; it is separated by a decided notch from the cartilage-plate, which is of moderate size, ovate, somewhat oblique, with its inner edge rounded and prominent.

Length, about 16 mm.; height, 13 mm.; breadth, 10 mm.; beak to end of rostrum, about 9 mm.; beak to anterior end, 8 mm.

A single, much broken, specimen (No. 78313), station 2706, N. lat. 41° 28′, W. long. 65° 35′, in 1,188 fathoms, 1886.

CUSPIDARIA FRATERNA, new species.

(Plates LXXI, figs. 7, 8; LXXV, fig. 6.)

Shell similar to *Cuspidaria obesa* (Lovén), moderately large, considerably swollen, rather thick and firm for the genus, with a moderately long, tapered rostrum. The umbos are rather prominent and swollen, with the strongly incurved beaks nearly in contact. The anterior end is broadly rounded with a regularly curved, convex dorsal edge which rises nearly to the height of the umbos; the ventral margin is a little protuberant. The postero-dorsal line slopes with a slightly concave outline to the end of the rostrum; on the ventral margin there is a distinct incurvature corresponding to a wave-like depression on the surface,

defining the base of the rostrum. The surface is nearly smooth and somewhat glossy, covered with fine lines of growth which become more prominent and irregular on the rostrum, which has no distinct diagonal line. The hinge-margin is somewhat thickened; the right valve has a rather short, prominent, obtuse, triangular lateral tooth only slightly separated from the cartilage-plate by a concave margin; the cartilage-plate is small, very oblique, with the inner edge curved and not at all angulated. Muscular scars and pallial line indistinct; no buttress.

Length, 13 mm.; height, 9 mm.; breadth, 6 mm.; from beak to end of rostrum, 8 mm.; from beak to anterior end, 7 mm.

Found at about thirty stations between N. lat. 40° 2′ 49″, W. long. 68° 49′, and N. lat. 37° 23′, W. long. 73° 53′, in 302 to 984 fathoms.

This species resembles *C. obesa* (Lovén) in form; it is, however, a larger species with a firmer and more swollen shell; the ventral margin is more prominent, so that it has a relatively higher form and is broader at the base of the rostrum. The hinge shows more decided differences, for in *C. obesa* the lateral tooth is smaller, shorter, and closely approximated to the cartilage-plate which is distinctly angulated, the inner end being acute and separated from the tooth by a small angular notch.

CUSPIDARIA OBESA (Lovén) Dall.

(Plate LXXV, fig. 7.)

Neæra obesa LOVÉN, Ind. Moll. Scand. Occid., p. 48, 1846.—VERRILL, Trans. Conn. Acad., V, p. 563, pl. XLIV, fig. 10*c*, 1882; VI, p. 277, 1884 (in part); Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 574, 1885 (in part).—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XIII, p. 43, 1885.

Cuspidaria obesa DALL, Bull. Mus. Comp. Zoöl., XII, p. 295 (not pl. III, fig. 1), 1886; Bull. U. S. Nat. Mus., No. 37, p. 66 (not pl. III, fig. 1), 1889.

Not *Neæra pellucida* STIMPSON.

This species has been found at about twenty-four stations between N. lat. 43° 23′, W. long. 68° 30′, and N. lat. 35° 12′ 10″, W. long. 74° 57′ 15″, in 96 to 811 fathoms, 1873–1887.

It is recorded by Mr. Dall from off Barbados in 100 fathoms and off the coast of California in 16 fathoms.

After a careful study and comparison of the numerous species belonging to the family Cuspidaridæ we have been able to satisfactorily prove that the form described by Stimpson as *Neæra pellucida* is quite distinct from that described by Lovén as *N. obesa*, with which it has been so long confounded.

CUSPIDARIA PELLUCIDA (Stimpson).

(Plates LXXV, fig. 8; LXXVI, fig. 8.)

Neæra pellucida STIMPSON, Invert. Grand Manan, p. 21, pl. 1, fig. 13, 1853.—GOULD, Invert. Massachusetts (2d ed.), p. 61, fig. 378, 1870.—VERRILL, Check-list, p. 24, 1879.

Neæra sp. VERRILL, Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 574, 1885.

Not *Neæra obesa* LOVÉN.

Shell small, much swollen, with a strongly tapered, somewhat produced rostrum. Umbos relatively large and prominent, beaks minute, strongly incurved. The anterior portion is broadly and evenly rounded, the margin forming nearly a semicircle, with the dorsal margin strongly convex and excurved, rising nearly as high as the umbos; the ventral margin is broadly rounded but distinctly incurved at the base of the rostrum which is rather narrow distally, obtusely rounded at the tip and slightly upturned; the postero dorsal margin slopes considerably, is nearly straight at first but becomes slightly concave on the rostrum. External surface nearly smooth but usually showing more or less prominent lines of growth, most distinct on the distal part of the rostrum which is destitute of a distinct diagonal line. The right valve has a short, very prominent, strongly curved lateral tooth rising close to the beak, the most prominent part being near the proximal end which rises rather abruptly from the very minute cartilage-plate from which it is not separated by a notch; just in front of the beak, the hinge-margin is distinctly thickened, sinuous, and a little prominent, forming a sort of tooth, separated from the lateral tooth only by the minute sunken cartilage-plate; the left valve also has a slight, sinuous thickening of the margin in front of the cartilage-plate.

Length of one of the largest specimens, 4.5 mm.; height, 3 mm.; breadth, 3 mm.; beak to end of rostrum, 3 mm.; beak to anterior end, 2.5 mm.

This species has been taken at Eastport Harbor; Bay of Fundy, near Grand Manan Island; and at about twenty-one stations between N. lat. 47° 40′, W. long. 47° 35′ 30″, and N. lat. 35° 14′ 20″, W. long. 74° 59′ 10″, in 52 to 516 fathoms, 1868–1886.

The specimens here described are from the Bay of Fundy, near Grand Manan Island and Eastport Harbor, very near the locality where Doctor Stimpson's types were obtained. In former articles we have united this species with *C. obesa* (Lovén). A careful reexamination of a large series of specimens of both forms has convinced us that they are distinct but closely related species. In *C. obesa* the anterior portion is more produced, giving the shell a more ovate outline; the rostrum is broader and rather more upturned; the cartilage-plate is relatively much larger, more prominent, and angular at the edge, and in the right valve is separated from the lateral tooth by an

angular notch; while the tooth itself is relatively smaller, shorter, less prominent, and more distinctly triangular in form.

CUSPIDARIA SUBTORTA (Sars).

(Plates LXXIII, fig. 1; LXXIV, figs. 4, 5.)

Neæra subtorta SARS, G. O., Mollusca Reg. Arcticæ Norvegiæ, p. 87, pl. 6, figs. 6, *a–c*, 1878.—JEFFREYS, Ann. Mag. Nat. Hist., p. 234, September, 1877; Proc. Zoöl. Soc., London, p. 937, November, 1881.—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XIII, p. 35, 1885.

Shell inequivalve, rather short, relatively high, much swollen in the middle, with tumid umbos and a short, tapered, somewhat upturned rostrum. The anterior portion is broadly rounded, the margin forming nearly a semicircle; the antero-dorsal margin is strongly convex and slightly excurved; the ventral margin is evenly rounded, except at the base of the rostrum where it is distinctly incurved, especially in the right valve; the postero-dorsal margin is very strongly concave in the left valve and less so in the right. The rostrum is separated from the body of the shell by a sinuous depression and has a poorly defined diagonal ridge; it is a little bent to the left and, when viewed from above, appears slightly twisted. The surface of the shell is nearly smooth, but shows distinct lines of growth anteriorly, and especially on the superior part of the rostrum; the epidermis is very thin, yellowish white, more or less wrinkled on the rostrum; the hinge-margin is rather strong; the lateral tooth in the right valve is large, rather elongated, rather prominent, obtusely triangular, and not separated from the very small, narrow, oblique, sunken cartilage-plate by a notch; in the left valve there is a small, short, prominent tooth arising from the posterior margin of the cartilage-plate and separated from the posterior hinge-margin by a distinct angular notch.

Length, 8 mm.; height, 6 mm.; breadth, about 5 mm.

One live specimen (No. 52545), station 2499, N. lat. 44° 46′ 30″, W. long. 59° 55′ 45″, in 130 fathoms, 1885.

This species appears to be identical with the European *subtorta*. It differs from all of our other species in having a distinct tooth-like tubercle behind the cartilage-plate in the left valve. The inequality of the valves and the twisted rostrum give the shell a peculiar aspect.

CARDIOMYA ABYSSICOLA, new species.

(Plates LXXIII, fig. 4; LXXIV, fig. 1; LXXVII, fig. 9.)

Shell rather large, swollen, with tumid umbos; outline elongate-ovate, with a narrow, rather elongated, tapered, slightly excurved posterior rostrum, the tips divergent and gaping; the anterior end is broadly round, with the dorsal and ventral margins convex, the latter narrowing gradually posteriorly with a slight sinus at the base of the rostrum; the postero-dorsal margin is concave, so that the end of the rostrum is

somewhat upturned. The entire body of the shell is covered with numerous narrow, elevated, radiating ribs, separated by much wider concave interspaces, some of the widest of which have a small secondary rib in the center toward the margin; the ribs increase in elevation and strength posteriorly, toward the base of the rostrum, but never become broad; for a short distance on the base of the rostrum the ribs are nearly obsolete but become prominent again on its dorsal and terminal portions; this part is also crossed by irregular raised lines of growth which cross the ribs obliquely; the inner surface is covered with rounded grooves corresponding to the external ribs, separated by convex ribs of about the same width; these become obsolete anteriorly and posteriorly. The hinge-margin in the left valve is only a little thickened and slightly excurved, the cartilage-plate is central, stout, regularly ovate in form, with a thickened inner margin; in the right valve there is a prominent, rather stout, elongated posterior tooth, the anterior end of which joins closely the cartilage-plate, leaving scarcely any notch between; the highest part of the tooth is near the middle, the slope, however, is a little steeper anteriorly; a deep groove separates the tooth from the thin, slightly excurved dorsal margin; anteriorly the margin is but slightly thickened, and shows a very narrow, beveled edge externally for the attachment of the thin ligament; a similar but more distinct ligamental groove extends from the beak to the base of the rostrum; there is a short, rather stout, rib-like clavicle or buttress running from beneath the middle of the tooth obliquely backward and downward in the direction of the base of the rostrum; a less prominent buttress is also present in the left valve.

Length of one of the largest specimens, 25 mm.; height, 15 mm.; thickness, 14 mm.; from beak to end of rostrum, 13 mm.; to antero-ventral margin, 12 mm. One badly broken valve is considerably larger than this. There are also two young live specimens which measure about 6 mm. in length and 3.5 mm. in height. Their form is somewhat narrower and longer than in the adult, and the rostrum appears rather longer and narrower; the postero-dorsal margin is nearly straight; the ventral margin is decidedly concave at the base of the rostrum; the shells are very thin, somewhat transparent and glossy, and have about twenty-six sharply defined, considerably elevated, nearly equal, narrow ribs on the body of the shell, separated by much wider spaces; the edge of the left valve overlaps that of the right, especially along the base of the rostrum.

In general appearance this species greatly resembles *C. multicostata* Verrill and Smith. It differs, however, in having a regularly more ovate form with the anterior region somewhat narrower and more prolonged and the postero-ventral margin less incurved at the base of the rostrum, so that the latter is broader and less differentiated. The external costæ differ in being narrow and sharp, separated by broad concave interspaces, and of nearly uniform size, there being no marked contrast between those on the anterior and posterior portions of the shell,

although the elevation and distance between them gradually increase posteriorly, while in the former they are broadly rounded and separated for the most part by narrow interstices. The hinge also differs considerably; the cartilage-plate is less prominent and broader than that of *multicostata*, and the tooth in the right valve is longer and not so prominent and scarcely forms a notch at its junction with the cartilage-plate; anteriorly the margin is very thin and simple with a very narrow, linear, ligamental groove along its outer edge, while in the former the groove is broader and its inner edge is raised almost in the form of a lateral tooth.

It also resembles *C. costellata* var. *corpulenta* Dall in the character of the costæ, but the latter is much shorter and higher in form and has a very short, ill-defined rostrum.

Two young live specimens, two separate valves, and some fragments were taken at three stations, between N. lat. 40° 29′, W. long. 66° 14′, and N. lat. 36° 47′, W. long. 73° 9′ 30″, in 1,685 to 1,813 fathoms, 1885–86.

CARDIOMYA MULTICOSTATA Verrill and Smith.

(Plate LXXIII, fig. 3.)

Neæra multicostata VERRILL, Trans. Conn. Acad., V, p. 559, pl. LVIII, fig. 40, 1882; VI, p. 277, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, pl. XXX, fig. 129, 1885.—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XIII, p. 36, 1885.

Not *Cardiomya striata* DALL, Bull. Mus. Comp. Zoöl., XII, p. 298, pl. III, fig. 10, 1886; Bull. U. S. Nat. Mus., No. 37, p. 66, pl. III, fig. 10, 1889; Proc. U. S. Nat. Mus., XII, p. 281, 1889.

Cardiomya striata DALL, Bull. U. S. Nat. Mus., No. 37, pl. LXV, fig. 129, 1889.

Not *Cardiomya costellata* (DESHAYES) var. *curta* DALL, Bull. Mus. Comp. Zoöl., XII, p. 297, 1886.

Neæra multicostata var. *curta* VERRILL, Trans. Conn. Acad., V, p. 560, 1882.

This comparatively rare species was found at but eight stations off Marthas Vineyard, in 85 to 158 fathoms, 1880–1882.

Although this species resembles *Cardiomya striata* (Jeffreys) in the character of its sculpture, the marked difference in outline, especially in its clearly defined rostrum, render it advisable to keep the two forms separate until a careful comparison of the hinges can satisfactorily decide the question of their identity.

The two valves designated as variety *curta* have the radiating ribs rounded and not angular, but fewer in number than the typical form, and must be distinct from *curta* of Jeffreys, which Mr. Dall makes a variety of *costellata* of Deshayes.

CARDIOMYA PERROSTRATA Dall.

(Plates LXXIII, fig. 2; LXXIV, fig. 3.)

Neæra perrostrata VERRILL, Trans. Conn. Acad., V, p. 561, 1882; VI, p. 277, 1884.
Cardiomya perrostrata DALL, Bull. Mus. Comp. Zoöl., XII, p. 296, pl. II, figs. 3*a*, 3*b*, 1886; Bull. U. S. Nat. Mus., No. 37, p. 66, pl. II, figs. 3*a*, 3*b*, 1889.

Only a few specimens were obtained from seven stations between N. lat. 40° 15′ 30″, W. long. 70° 27′, and N. lat. 39° 46′ 30″, W. long. 70° 54′, in 58 to 325 fathoms, 1880–1884.

South to Granada, in 339 to 416 fathoms.—Dall.

CARDIOMYA GEMMA, new species.

(Plates LXXI, figs. 3, 4; LXXIV, fig. 11.)

Neæra paucistriata BUSH, Trans. Conn. Acad., VI, p. 473, 1885.
Not *Myonera paucistriata* DALL, Bull. Mus. Comp. Zoöl., XII, p. 302, 1886; Bull. U. S. Nat. Mus., No. 37, p. 68, 1889; Proc. U. S. Nat. Mus., XII, p. 233, pl. XIII, fig. 12, 1889.
Cardiomya sp. BUSH, Bull. Mus. Comp. Zoöl., XXIII, p. 227, 1893.

Shell small, inequivalved, thin, fragile, translucent, bluish white, somewhat ovate, with a well-defined rostrum. Umbos smooth, a little prominent; the beaks small, inconspicuous. The antero-dorsal margin is convex and rises distinctly above the beaks so that the greatest height of the shell is in front of them; thence it slopes rapidly to the somewhat prominent anterior end; the ventral margin is broadly rounded with a slight angle at the termination of each radial rib, decidedly incurved at the base of the rostrum which is a little elongated, nearly straight, somewhat tapered, and rather upturned distally; the postero-dorsal margin is depressed and somewhat concave. Each valve has three conspicuous, prominent, thin, elevated, distant, radial ribs on the posterior half and a fourth less distinct one at about the middle; this is rudimentary in the left valve; none of them reach the umbos. The surface is also covered with very delicate lines of growth; the rostrum does not have a diagonal ridge. The hinge-margin is thin and delicate; the right valve has a small but prominent, moderately long lateral tooth separated from the very minute cartilage-plate by a distinct notch. The lateral tooth is supported by a small buttress.

Length, 5 mm.; height, 3 mm.

A few specimens off Cape Hatteras, North Carolina, in 16 and 17 fathoms, 1884.

CARDIOMYA GLYPTA Bush.

(Plates LXXI, fig. 1; LXXVI, figs. 3, 7.)

Neæra costata BUSH, Trans. Conn. Acad., VI, p. 472, pl. XLV, fig. 21, 1885; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 587, 1885; not Sowerby, 1834.

Cardiomya ornatissima DALL, Bull. Mus. Comp. Zoöl., XII, p. 296, 1886; Bull. U. S. Nat. Mus., No. 37, p. 66, pl. XLI, fig. 21, 1889.

A few specimens were found at two stations off Cape Hatteras, North Carolina, in 48 fathoms. South to Guadaloupe, in 2 to 124 fathoms.—Dall.

In addition to the published description it should be stated that the antero-dorsal margin of the right valve rises into a distinct, prominent, obtuse lobe in front of the tooth; this lobe overlaps the margin of the left valve when the shell is closed. There is a small buttress beneath the posterior lateral tooth. One broken valve, considerably larger than the type, has in the intervals between the three primary ribs two or three small secondary ones; on the anterior end six ribs are visible, of which one or two are larger than the rest, so that altogether about thirteen or fourteen ribs can be counted; some of these are, however, very small and extend only part way to the umbo; even the largest do not extend over the extreme part of the umbo.

Mr. Dall considers this species to be identical with D'Orbigny's *ornatissima*, but we see no sufficient reason for uniting the two forms.

The name *costata* was used by Sowerby in 1834.

HALONYMPHA STRIATELLA, new species.

(Plates LXXII, figs. 2, 3; LXXVII, fig. 10.)

Shell small, thin, broadly and obliquely ovate, with a narrow, short rostrum. Umbo swollen. Beak behind the middle. The antero-dorsal margin is broadly and nearly evenly convex; the anterior end is evenly rounded; the ventral margin is broadly convex with a slight incurvature at the base of the rostrum, which is short, narrow, and obtuse at the end; the postero-dorsal margin is strongly concave and slopes rapidly. In the region of the umbo the surface is lustrous and nearly smooth, but marked with faint, parallel lines; elsewhere it is closely covered with very regular, fine, raised concentric lines separated by incised lines of about the same width or narrower; on the rostrum there is a faint diagonal ridge posterior to which the concentric lines are irregular. The interior surface is smooth and lustrous but the external lines show through by transparency. In the right valve there is a small, sharp, triangular tooth projecting inward with a very small cartilage-pit in front of and confluent with it; slightly farther forward there is another small, slender tooth rising nearly parallel with the

margin; external to this there are remnants of a small anterior ligament occupying a short furrow. Commencing behind the beak and extending to the base of the rostrum, there is a comparatively large and prominent lamelliform process rising from beneath the margin and projecting downward, with the face portion broadly rounded, and its upper surface concave. Above the base of this, and extending from near the beak to about the middle of the rostrum, is a narrow, slightly thickened ridge separated from the dorsal margin by a narrow furrow.

Length, 6 mm.; height, 4.5 mm.; breadth, about 3 mm.

One valve, station 2655, among Foraminifera, N. lat. 27° 22′, W. long. 78° 7′ 30″, in 338 fathoms, 1886.

This species has considerable resemblance to *H. claviculata* Dall, but the latter is more regularly ovate in form, and has a much shorter and broader rostrum, and somewhat coarser sculpture. The posterior shelf-like clavicle also differs in form, being quite narrow for a considerable distance next the cartilage-pit, and more expanded distally. The shell described and figured by Smith[1] under the same name appears to be a distinct species, and may be identical with our shell, for it has nearly the same form and agrees closely in the narrow tapered rostrum. The figure of the interior, however, in that case, is incorrect, owing to the omission of the clavicle, and apparently the substitution of the hinge of the left valve for the right.

MYONERA GIGANTEA Verrill.

(Plate LXXVI, figs. 4, 5.)

Neæra gigantea VERRILL, Trans. Conn. Acad., VI, pp. 223, 277, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 574, 1885.

Three imperfect, dead specimens have been found at three stations between N. lat. 38° 22′, W. long. 70° 17′ 30″, and N. lat. 37° 56′ 20″, W. long. 70° 57′ 30″, in 1,825 to 1,917 fathoms, 1883 and 1886.

MYONERA RUGINOSA (Jeffreys) Verrill and Bush.

(Plates LXXII, fig. 4; LXXIV, fig. 2.)

Neæra ruginosa JEFFREYS, Proc. Zoöl. Soc. London, p. 942, pl. LXXI, fig. 7, November, 1881.—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XIII, p. 35, 1885.

Shell small, short, broad-ovate, not much swollen, with a short, wide, gaping, obliquely truncate rostrum. Umbos small, prominent, not much swollen; beaks small, prominent, incurved, smooth and shining. The anterior portion is evenly rounded, nearly semicircular; the antero-dorsal margin is convex and prominent; the ventral margin is broadly and evenly rounded, except at the base of the rostrum where it is sinuous and incurved; the postero-dorsal margin is nearly straight to the

[1] Report Voy. *Challenger* Zoöl. Lamellibranchiata, XIII, p. 52, pl. IX, figs. 8–8*b*, 1885.

end of the short rostrum which has a distinct, median, diagonal ridge or angulation and another less distinct one at its base. The surface of the shell is thickly covered with very numerous, and crowded, concentric, more or less irregular, raised lines of growth which give it a finely lamellose appearance when viewed under a lens. These lines become more crowded, more prominent, and form two sinuous waves in crossing the rostrum. Color, in alcohol, white tinged with reddish brown. The hinge-margin is delicate; the right valve has no lateral tooth but shows a slight thickening of the posterior margin; the cartilage-plate is small, ovate, directed backward.

Length, 6 mm.; height, 4.5 mm.; breadth, 3 mm.

One live specimen (No. 52544), station 2570, N. lat. 39° 54′, W. long. 67° 5′ 30″, in 1,813 fathoms, 1885.

"*Porcupine* Expedition, 1870," off Cape Mondego, in 740 to 1,095 fathoms.—Jeffreys.

MYONERA LIMATULA Dall.

(Plate LXXIV, fig. 8.)

Neæra limatula DALL, Bull. Mus. Comp. Zoöl., IX, p. 112, 1881.—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XII, p. 35, 1885.

Myonera limatula DALL, Bull. Mus. Comp. Zoöl., XII, p. 304, pl. III, fig. 5, 1886; Bull. U. S. Nat. Mus., No. 37, p. 68, pl. III, fig. 5, 1889.

A single live specimen (No. 38171) was taken at station 2048, N. lat. 40° 2′, W. long. 68° 50′ 30″, in 547 fathoms, 1883.

MYONERA (?) PRETIOSA, new species.

(Plate LXXVII, fig. 5.)

Shell small, very thin and fragile, nearly transparent, compressed, elongate-oval with a well-defined, somewhat elongated rostrum. Umbo prominent, scarcely oblique and nearly smooth. The antero-dorsal margin is convex, anterior end evenly rounded; ventral margin broadly convex, becoming incurved at the base of the rostrum; postero-dorsal margin nearly straight. The antero dorsal region is distinctly excavated in front of the beaks. The body of the shell is ornamented with ten or more thin, distinct, slightly raised, concentric riblets separated by much wider interspaces. On the rostrum there are two well-marked minutely spinulous keels between which are delicate lines of growth; the first runs from the beak quite close to and parallel with the dorsal margin; while the second extends from the umbo diagonally across the rostum to its lower edge.

Length, 6 mm.; height, 3 mm.; breadth, about 2 mm.

This shell has no very close resemblance to any hitherto described.

One valve, station 2655, N. lat. 27° 22′, W. long. 78° 7′ 30″, in 333 fathoms, among Foraminifera, 1886.

As but a left valve was found, the true position of this species can not be decided.

Family POROMYIDÆ.

POROMYA SUBLEVIS Verrill, variety MICRODONTA Dall.

(Plates LXXVI, figs. 1, 2; LXXXVII, fig. 1.)

Poromya sublevis VERRILL, Trans. Conn. Acad., VI, pp. 221, 277, pl. XXXII, fig. 21, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 574, pl. XXX, fig. 128, 1885.—DALL, Bull. Mus. Comp. Zoöl., XII, pp. 281, 282, 1886; XVIII, p. 448, 1889 (variety?); Bull. U. S. Nat. Mus., No. 37, p. 68, pl. LXV, fig. 128, 1889.

Poromya microdonta DALL, Proc. U. S. Nat. Mus., XII, p. 290, pl. VIII, fig. 6, 1889 (variety?).

Shell rather large, thick, well-rounded, cordate, inequivalved, very tumid, with very large, prominent umbos which are strongly curved forward spirally; beaks large; lunule small, cordate, often not very distinct. The shell varies considerably in outline and size and elevation of the umbos; in most specimens the height equals or slightly exceeds the length; the outline of the cavity of the shell is usually somewhat elliptical, the length decidedly exceeding the height, but sometimes it is nearly circular. The anterior and posterior margins are usually pretty evenly rounded; the ventral margin usually projects a little in the middle; the beak is situated in front of the median line. Externally the shell is nearly smooth and is covered with a thin, closely adherent, brownish-yellow epidermis; under a lens the surface shows minute raised points or granules which are arranged in radial rows that become more distinct and crowded posteriorly but for the most part disappear on the most prominent part of the umbos. These granule-like points are variable in number and distinctness, in some specimens being nearly obsolete and in others distinct and regularly arranged; the epidermis often also shows fine lines of growth; the beaks are smooth and shining. The left valve has a posterior, wave-like, radial depression, and behind this a low, rounded ridge projecting at the margin as a slight siphonal lobe; in the right valve, the corresponding lobe and depression are only faintly marked in most cases. The right valve is larger than the left and overlaps it considerably along the ventral margin and both in front of and behind the beaks. The interior is pearly and often shows radial striations. The hinge-margin is considerably thickened and strongly curved; the right valve has a large, thick, somewhat rounded tooth just beneath the beak and adnate to the inner surface of the shell, for some distance within the cavity of the beak and to the thickened edge behind the beak, but separated from the anterior margin by a deep, curved furrow in the lunular area; the lunular margin is convex and somewhat everted, separated from the rest of the anterior margin by a slight notch. The ligament is rather long and well-rounded and its groove extends forward in a curved furrow under the beak; it extends backward in a curved line parallel with the margin of the shell for some distance

behind the tooth. External to the posterior part of the ligament there is a submarginal thickening or fold, especially in the right valve. In the left valve the central tooth is represented by an irregular, bilobed, or somewhat V-shaped thickening of the margin, of which the anterior part, situated just in front of the beak, is the more prominent; but this varies in form in different specimens. The postero-dorsal margin along the ligamental region is less thickened but has a distinct rounded ridge inside the ligament.

Length of one of the largest specimens, 16 mm.; total height, 16 mm.; height of cavity, 12 mm.; breadth, 16 mm. In a more rounded specimen the length is 15 mm.; total height, 16 mm.; height of cavity, 13.5 mm.; breadth, 14 mm.

A few dead specimens of the typical form (*sublevis*) have been taken at five stations between N. lat. 39° 15′, W. long. 68° 8′, and N. lat. 37° 56′ 20″, W. long. 70° 57′ 30″, in 1,594 to 1,917 fathoms, 1883–1886.

Several live and dead specimens of the varietal form (*microdonta*) have been taken at eight stations between N. lat. 39° 26′, W. long. 68° 3′ 30″, and N. lat. 36° 47′, W. long. 73° 9′ 30″, in 1,631 to 1,859 fathoms, 1885–1886.

Mr. Dall extends the range south to Patagonia, in 122 to 1,635 fathoms.

Our specimens show considerable variation in form as well as in the prominence of the cardinal tooth in the right valve, and thus unite the extreme forms *P. sublevis* Verrill, and *P. microdonta* Dall.

CETOCONCHA ATYPHA, new species.

Shell short-ovate, nearly equilateral, and nearly equally rounded at both ends, judging from the lines of growth. Umbos rather prominent, but less so than in several allied species. Beaks rather prominent and curved strongly forward, but not spiral. Surface somewhat shining and slightly iridescent where rubbed, covered with a very thin, yellowish epidermis with very numerous, minute, granule-like elevations which are arranged in regular radiating lines, and are much the most numerous on the posterior end where the radial rows are closely crowded and the granules in each are also near together; on the center the rows and granules are more distant, so that the number is only about half as great in the same space; on the anterior end they are so scattered that the radial rows are indistinct and the granules are a little larger; on the lunular area they are nearly obsolete. The anterior end and lunular area are marked by rather conspicuous lines of growth which, near the dorsal margin, take the form of distinct, raised, concentric ridges. The antero-dorsal margin is nearly horizontal and rises up, in a side view, in an acute edge, a little higher than the level of the beak, so as to produce a broad, compressed, lunular margin. When viewed from above, this part of the margin forms a very marked obtuse angle with the posterior hinge-margin. The postero dorsal margin is also nearly