

horizontal, slightly convex or nearly straight; the ligament is very prominent behind the beak, extending backward in a conspicuous groove nearly to the posterior end, and terminates anteriorly in a deep narrow groove directly under the beak. In the left valve the inner edge of the posterior hinge-margin is somewhat sinuous; just behind the beaks, opposite the most prominent part of the umbos, it is thickened and somewhat revolute, decreasing both in thickness and elevation to a shallow indentation of the margin; back of this, it increases regularly in thickness and prominence and is again revolute along the posterior part of the ligamental furrow. There is no central tooth nor any distinct resilium. In the right valve the posterior hinge-margin is even more thickened and revolute just back of the beaks, and the indented, thinner portion, at the end of the prominent part of the ligament, is more marked. The ligamental groove is consequently less conspicuous, being partially concealed by the revolute margin. The antero-dorsal margin is compressed and projects strongly upward, rising distinctly above the umbos in a side view and is more convex than in the left valve. There is also a slight elevation within the dorsal margin directly below the beaks, which might be considered the rudiments of a tooth.

The largest specimen, when perfect, would be about 15 mm. long.

Two very much broken valves, station 2229, N. lat.  $37^{\circ} 38' 40''$ , W. long.  $73^{\circ} 16' 30''$ , in 1,423 fathoms, 1884.

This species somewhat resembles *Cetochonca nitida* (Verrill)<sup>1</sup> Dall.<sup>2</sup> It is however more oblong, with the umbos much smaller and less prominent and the beaks less spiral and nearer together. The granulation of the surface is somewhat stronger and more generally distributed. The ligamental groove is longer, deeper, and the ligament itself is more prominent behind the beaks. The angulation of the hinge-margin of the left valve in a horizontal plane is a peculiar feature not found in the other related species and indicates that the valves are decidedly unlike in form, but the right valve is too much broken to show the anterior margin.

#### CETOMYA species.

A broken left valve (No. 52013) from station 2481, N. lat.  $44^{\circ} 7' 30''$ , W. long.  $57^{\circ} 16' 45''$ , in 116 fathoms, resembles *Poromya* (*Cetomya*) *elongata* Dall, from the West Indies and Barbados, in 100 to 119 fathoms. It is, however, too incomplete for determination without direct comparison with authentic specimens.

It is larger and more strongly truncate posteriorly than *Poromya granulata* (Nyst) Forbes and Hanley, and the granules are coarser and not so numerous. It differs, moreover, very strongly in the hinge characters, for the hinge-plate is much thinner and the large tooth in the left valve is wanting in our species.

<sup>1</sup> *Thracia nitida* Verrill, Trans. Conn. Acad., VI, p. 221, pl. xxxii, fig. 22, 1884.

<sup>2</sup> *Cetochonca nitida* Dall, Bull. Mus. Comp. Zool., XII, p. 281, 1886.

## Family VERTICORDIDÆ.

## VERTICORDIA GRANULIFERA (Verrill) Dall.

(Plates LXXXVII, fig. 2; XCV, figs. 2, 3, 4.)

*Pecchiolia granulifera* VERRILL, Trans. Conn. Acad., VI, pp. 434, 448, 450, 1885.*Verticordia granifera* DALL, Bull. Mus. Comp. Zoöl., XII, p. 286, 1886.*Verticordia granulifera* DALL, Bull. U. S. Nat. Mus., No. 37, p. 66, 1889.

In addition to the published description, it should be stated that in the type-specimen (No. 44838), the lunular area is small, deeply sunken, with the corresponding internal margin very much thickened, forming a strong, curved, tooth-like projection having a rounded summit, reaching strongly above the margin of the shell when seen in a profile view; behind this, directly under the beak and beneath the overhanging margin, there is a triangular space or notch for the reception of the prominent tooth of the opposite valve; this is followed posteriorly by a short, triangular, shelf-like projection, a little beneath the margin, which has a depression on its upper surface for the reception of its ligament but shows, in this specimen, no notch or scar corresponding to the ossicle. Directly under the strongly incurved beak there is a slight, thin groove in which the front part of the ligament was attached. The postero-dorsal edge is a little thickened and projects inward beyond the general line of the margin; its outer surface has a smooth, slightly excavated groove, extending parallel with the edge, for some distance; this portion was overlapped by the projecting edge of the opposite valve.

A very large specimen (No. 78679) from station 2713, which measures 21 mm. in length, 22½ mm. in height, and 10 mm. in thickness, has, in the right valve, directly beneath the beak, a very strong, high, curved, pointed, angular tooth attached by a very broad, thick base, a considerable distance within the margin. Behind the ossicle, well within and nearly parallel with the margin for its entire length, is a conspicuous shelf-like ridge against which the projecting edge of the opposite valve rests. The ossicle is strong, somewhat rectilinear in outline, with the posterior end deeply forked, the inner surface strongly convex, the outer strongly concave, with thick, somewhat beveled edges, to which the ligament is attached. Interior surface somewhat pearly. Scars and pallial line not very clearly defined.

But four specimens, beside the type, have been found at four stations between N. lat. 40° 9' 30'', W. long. 67° 9', and N. lat. 36° 47', W. long. 73° 9' 30'', in 1,356 to 1,859 fathoms, 1884-1886.

## Family LYONSIELLIDÆ.

## LYONSIELLA SUBQUADRATA (Jeffreys.)

(Plate LXXXVII, fig. 3.)

*Pecchiolia subquadrata* JEFFREYS, Proc. Zool. Soc. London, p. 932, pl. LXX, fig. 3, November, 1881.—Not DALL, Bull. Mus. Comp. Zool., XII, p. 272, 1886.

Our specimen seems to agree in every respect, except size, with the original description and figure as given by Jeffreys, ours being considerably larger.

The umbo is prominent and the beak is curved strongly forward, producing a deep lunular area which is defined neither by a groove nor a ridge. The surface is everywhere covered with small but prominent granules which are numerous, pretty evenly spaced, and arranged somewhat distinctly in radiating rows which, under the microscope, are defined by slight radial ridges uniting those of the same row. The granulations are easily visible with slight enlargement. Under the compound microscope they have the form of elevated, acute cones and blunt tubercles, their height usually greater than their diameter, except on the umbo, where they are low and rounded. Internally the surface is everywhere marked with small, deep pits looking like punctures made by a fine needle, and corresponding to the external granules. The hinge margin is thickened and entirely edentulous, as described by Jeffreys. Posterior to the beak there is a distinct groove in the thickness of the margin for the reception of a ligament. Beneath the beak there is a slight, oblique, marginal notch or slit for the reception of the resilium, running back within and underneath the dorsal margin, so that it is scarcely visible in a direct front view.

This shell appears to be identical with the species originally described and figured by Jeffreys under the name of *Pecchiolia subquadrata*. Mr. Dall has evidently found an entirely different species in the Jeffreys's collection under this name, which he has referred to the genus *Callocardia* and subgenus *Vesicomya*, belonging to an entirely different family from our shell. In order to avoid confusion the shell examined and described by Mr. Dall should receive a distinct specific name; we therefore propose *Callocardia (Vesicomya) dalli*. Mr. Dall states that "the sparsely set, microscopic tubercles can only be observed with a magnifier; to the eye the surface looks shining and smooth," which shows the surface to be quite different from that of our shell. In his shell there are also two cardinal teeth in each valve.

One valve (No. 78800), station 2714, N. lat. 38° 22', W. long. 70° 17' 30'', in 1,825 fathoms, 1886.

North of the Hebrides, in 542 fathoms; and off Cape Mondego in Vigo Bay, in 740 to 1,095 fathoms. "Porcupine Expedition, 1869-70."—Jeffreys.

## LYONSIELLA CORDATA, new species.

(Plate XCV, figs. 7, 8.)

Shell rather large and firm for the genus, somewhat translucent bluish white, swollen, cordate, with a posterior obtuse prominence. Umbos prominent, turned forward spirally; beaks small, strongly incurved. Lunule small, cordate, defined only by one of the ordinary fine radial ridges; the part that lies immediately under the beak is deeply sunken with the edge pinched up into a prominent keel. The antero-dorsal margin is strongly convex and prominent in the lunular region, but not so high as the umbos; the anterior margin is but slightly convex and nearly perpendicular to the axis of the shell; the ventral margin is strongly convex and somewhat produced in the middle, farther back it is but slightly convex; the posterior end is obtusely rounded, decidedly prominent but not angular; the postero-dorsal margin is a little convex and slopes gradually. The surface is covered with about sixty delicate, radiating, raised lines or riblets which are crossed by fine lines of growth, the thin, brownish or grayish green epidermis often rising into small points at their intersection, especially anteriorly and posteriorly; these riblets become coarser and more distant anteriorly, and are lacking on the lunule. The ligament is thin and strong and extends backward along nearly the whole of the dorsal margin and curves spirally under and around the beak in the region of the resilium, so that the two come almost in contact. The hinge margin, in front of the beak and lunular area, is strongly convex and protuberant, rising nearly to the height of the umbo; posteriorly it is convex and thin in both valves; in the left one it is strengthened by a slight marginal rib within the ligamental furrow; both of these are less evident in the right valve. There are no teeth in either valve. The ossicle is relatively large, oblong, somewhat saddle-shaped, narrowest and truncated anteriorly, broadest and forked posteriorly, the divisions acute. The resilium beneath the ossicle is well developed, dark brown, and extends forward and upward to the margin, beneath the beak.

Length of the largest specimen, 11 mm.; height, 12 mm. Another is 11 mm. long; 11.5 mm. high; 9 mm. broad.

Two living specimens and one valve, at three stations between N. lat.  $39^{\circ} 15'$ , W. long.  $68^{\circ} 8'$ , and N. lat.  $37^{\circ} 38' 40''$ , W. long.  $73^{\circ} 16' 30''$ , in 1,423 to 1,825 fathoms, 1884-1886.

## Family LYONSIDÆ.

## LYONSIA GRANULIFERA, new species.

(Plate XCV, fig. 1.)

Shell oblong, truncated posteriorly, narrowed and rounded anteriorly. Umbo rather prominent with the beak in front of the middle and curved forward; lunular area considerably sunken. Anterior end evenly

rounded with the dorsal margin rapidly sloped; ventral margin broadly and evenly rounded; posterior end somewhat obliquely truncated without any definite boundary, but with a distinct depression extending from under the beak to about the middle of the posterior margin; postero-dorsal margin nearly straight, longer, and sloping less rapidly than the anterior. The entire surface is covered with minute, irregular, raised, granules and pretty distinct, but irregular, lines of growth and slightly raised, distant, thin, radiating lines running from the umbo to the margin, except on the posterior end where the lines of growth become more prominent; these radial lines are however, in many places, rather faint and seem to consist mainly of the thin, brownish epidermis, which is lacking in certain parts. Minute grains of sand and shells of Foraminifera are firmly adherent to the surface, mainly along the radial lines, and especially posteriorly. The interior is white, lustrous and but slightly nacreous. Muscular and pallial scars indistinct. The hinge-margin is thin; in the left valve the anterior border is somewhat thickened in the lunular area and terminates abruptly in a rounded, tooth-like shoulder just under the beak; the posterior margin shows a slightly raised elongated, roughened area for the attachment of the resilium, commencing under the beak and running back for some distance within the margin, on its nearly vertical inner surface, so that it is scarcely visible in a front view. Ossicle not observed. Ligament very thin, occupying a groove along the posterior margin.

Length, 19 mm.; height, 13 mm.; breadth, 9 mm.; from the beak to the antero-dorsal angle, 7 mm.; to the postero-dorsal angle, 12 mm.

One valve (No. 52561), station 2492, N. lat.  $45^{\circ} 22'$ , W. long.  $58^{\circ} 43' 45''$ , in 75 fathoms, 1885.

This species is allied to *L. arenosa* (Moller) with which it agrees very closely in the character of the external surface and structure of the hinge. It differs in its longer, more ovate form, in its more produced anterior end, and in its less swollen umbo.

#### Family PANDORIDÆ.

##### CLIDIOPHORA INORNATA, new species.

(Plate XCV, figs. 5, 6.)

Shell small, much compressed, very inequilateral, posterior end narrowed, somewhat acuminate, the right valve flat or slightly convex and the left valve a little swollen. Umbos not prominent; beaks small and appressed. The antero-dorsal margin is slightly convex and slopes rapidly to the bluntly rounded anterior end; the ventral margin is broadly rounded and slightly prominent, considerably behind the middle, beyond which it is incurved to meet the posterior rostral angulation; the posterior end is produced into a short, narrow, sub-truncated, slightly upturned rostrum, its lower angle formed by a somewhat prominent, radial rib or ridge, extending from the beak (on the

left valve); the postero-dorsal margin is usually slightly concave, but is sometimes nearly straight, and in some cases decidedly concave, and slopes gradually to the superior angulation of the rostrum; the ligamental area is narrow, deep, and long, extending for nearly the entire length of the dorsal margin, and is clearly defined by a marginal ridge which is sharper on the left valve. In most specimens this valve is marked by a slight, ill-defined groove running from the beak to the antero-ventral margin, where it often forms a slight emargination, but is often scarcely discernible, except by the change in the direction of the lines of growth and character of the epidermis. The surface of the left valve is covered with irregular concentric ridges and rather uneven lines of growth; the right valve usually shows rather regular, concentric undulations on which are numerous fine, pretty regular, lines of growth; this valve is also usually marked by faint, and rather indistinct, radiating, impressed lines which are more or less broken and often branched or forked; these are scarcely visible without a lens. Epidermis thin, brownish yellow, usually mostly peeled off in dry specimens, but on the anterior end, in front of the radial groove, it is a little more persistent. In the left valve the anterior tooth is strong and prominent, with the proximal end the thicker, more elevated, rounded or clavate; distally it is curved and diverges considerably from the antero-dorsal margin; between this tooth and the resilial pit, there is a small central tooth only a little elevated. The resilial pit is directed obliquely backward, and its cavity is obliquely upturned, forming a distinct excavation on the inner surface of the posterior tooth with which it is confluent; this posterior tooth is simply a distinctly thickened and slightly elevated portion of the postero-dorsal margin, which forms the boundary of the ligamental area, it is often, but not always, opposite the position of the resilial pit. In the right valve the anterior tooth is a slightly raised, somewhat curved ridge on the inner surface of the shell, running to the middle of the anterior muscular scar; the central tooth is shorter and much more elevated, most prominent at its inner end; between these two teeth there is an additional, slightly raised, tooth-like ridge; the posterior tooth is about as long as the anterior, and much more elevated and stouter, its distal end being the thicker and higher, with a distinct angular summit; the oblique resilial pit is excavated out of its anterior surface. The ossicle is somewhat elongated, curved or crescent shaped. The interior of the shell is only slightly lustrous and shows but little iridescence.

Length of one of the largest specimens, 19 mm.; height, 11 mm.; thickness, about 3 mm.

Found in considerable numbers at twenty-three stations, north of Cape Cod, off Stellwagens Bank, and off Chatham, in 10 to 43 fathoms, 1872-1881.

This species, which is common in the vicinity of Cape Cod, has probably been confounded, hitherto, with *C. trilineata* Say, and *C. gouldiana* Dall. From the latter, which occurs abundantly in the same

region, it differs in its much smaller size, much less iridescent interior, straighter postero-dorsal margin, less upturned rostrum, and narrow, or more acuminate, posterior half of the shell. The hinge also differs in several respects.

**KENNERLIA BREVIS**, new species.

(Plate LXXXVIII, figs. 7, *a*, *b*.)

*Kennerlia glacialis* VERRILL, Notice of Recent Add. to Mar. Invert., Pt. 2, Proc. U. S. Nat. Mus., III, p. 397, 1881; Trans. Conn. Acad., V, p. 567, 1882; VI, p. 277, 1884.—DALL, Bull. U. S. Nat. Mus., No. 37, p. 68, 1889 (in part).

Shell short, sublunate, very inequilateral, obtuse at both ends, slightly narrowed anteriorly. The antero-dorsal margin is short and slopes rather rapidly to the anterior end, where it forms an obtuse angle with the ventral margin which is broadly and nearly evenly rounded, and passes into the rounded posterior margin without angulation, but sometimes with a slightly sinuous curve below; there is also, sometimes, a very slight sinuosity anteriorly; the postero-dorsal margin is nearly straight. The left valve is rather convex, moderately thick, nearly smooth, with a distinct, narrow radial ridge running from the beak to the posterior end. The right valve is smaller, concave or nearly flat, lunate, widest behind the middle, regularly curved ventrally or faintly sinuate anteriorly; its surface is marked by lines of growth and crossed by radial grooves, of which about ten are very distinct, while many others, much finer, can be seen with a lens. In the right valve the hinge consists of two small, divergent teeth, both of which are directed posteriorly. The rather thin, elongated posterior one, in a profile view, is obtusely triangular, its highest point distal to the middle; the slender resilium is attached to this, nearly the whole length of its anterior side, and carries a long, narrow ossicle. The cardinal tooth directly under the beak, is much shorter and somewhat thicker, with its highest point near the proximal end which is close to the dorsal margin. There is also a slightly elevated, rather indistinct, anterior submarginal ridge, parallel with the margin, which supports a slender ligamental groove. In the left valve the hinge consists of a submarginal, thickened, blunt anterior tooth, running forward subparallel with the margin, and a posterior submarginal thickening or ridge having the resilium attached to its anterior side; the V-shaped space is relatively very wide and is not divided by any distinct intermediate ridges, such as occur in typical *Pandora*. The resilium appears to be simple, not divided in a V-shaped form as in the latter genus.

Length of one of the largest specimens, 11.5 mm.; height, 7 mm.; thickness, 3 mm.

Found in small numbers at about ten stations between N. lat. 40° 15' 30'', W. long. 70° 27', and N. lat. 35° 10' 40'', W. long. 75° 6' 10'', in 58 to 100 fathoms, 1880-1886.

This species, which is southern in its range, is closely related to the

northern *K. glacialis* (Leach) with which it was formerly identified. It is a smaller, shorter, and more inflated species, with a shorter and more sloping antero-dorsal margin and a more evenly curved ventral margin, without the distinct antero-ventral indentation seen in that species. The convex valve has a distinct, posterior radial ridge which is faint or lacking in *K. glacialis*. There are also differences in the hinge, in the right valve of the latter the teeth are more divergent, etc.

Doctor Carpenter, who established the group *Kennerlia*, defined it as differing from typical *Pandora* in having an ossicle on the cartilage or resilium, and radial grooves on the right valve. Perhaps the simple linear form of the resilium in *Kennerlia* and its forked or V-shaped form in true *Pandora* (type *P. rostrata* Lamarck) may be of more importance. The intermediate ridge in the left valve of *Pandora* fits between the two divisions of the V-shaped resilium. There is also in *Kennerlia* a small, buttress-like projection within the margin, under the beak, which supports an inward projecting portion of the ligament, darker in color than the resilium.

#### Family PERIPLOMIDÆ.

##### PERIPLOMA AFFINIS, new species.

(Plate LXXXVII, fig. 4.)

Shell thin, fragile, broad-ovate, with the beaks behind the middle and with a short, narrowed posterior end. The antero-dorsal margin is broadly convex; anterior end nearly evenly rounded, but slightly produced in the middle; ventral margin evenly convex to the base of the rostral region where it becomes slightly incurved; posterior end much narrowed, compressed and produced into a short, blunt rostrum with the edges gaping slightly at the end; postero-dorsal margin nearly straight, sloping rapidly to the angle of the rostrum; a faint diagonal ridge extends to the lower rostral angle, posterior to which the shell is smoother than elsewhere and marked with several faint, radial riblets. The general surface is covered with irregular, uneven and often rather faint, concentric undulations, separated by rather wide concave intervals which, like the elevations, are covered by thin, elevated lines of growth. The undulations are most regular on the umbos and become less distinct and more irregular toward the margin and anteriorly, and show by transparency on the interior of the shell. The chondrophore is small, but very prominent, spoon-shaped, narrow at the base and expanded distally, with a nearly round resillial pit. The ossicle is well developed, bent into a crescent shape, and so formed as to fit into the small rounded notch in the shell margin in front of the chondrophores. A somewhat elevated submarginal ridge extends forward from the notch and serves to support the thin ligament; a similar but less prominent ridge extends backward from the chondrophores and defines a distinct ligamental groove.

Length of the largest specimens, 13 mm.; height, 10 mm.; breadth, 8 mm.

Three specimens were found at three stations, off Marthas Vineyard, in 100 to 115 fathoms, 1880-81.

This species resembles *P. undulata* in sculpture, but the latter is narrower and longer in form, and has a more decidedly longer rostrum; its chondrophore is shorter and broader, and not so distinctly spoon-shaped distally, while the marginal notch in front of it is relatively much smaller.

#### PERIPLOMA UNDULATA Verrill.

(Plates LXXIX, fig. 1; LXXXVII, fig. 5.)

*Periploma undulata* VERRILL, Trans. Conn. Acad., VI, pp. 433, 448, 1885.

A few specimens were found at six stations between N. lat.  $39^{\circ} 9'$ , W. long.  $73^{\circ} 3' 15''$ , and N. lat.  $36^{\circ} 42'$ , W. long.  $74^{\circ} 30'$ , in 541 to 816 fathoms, 1884-1887.

#### Family LIMIDÆ.

##### LIMATULA REGULARIS, new species.

Shell small, thin, nearly equilateral, much higher than long, with the hinge-line straight and rather long. Umbos and median part of the shell swollen. Beaks rather prominent, directly incurved. Ligamental area relatively large, elongated, diamond-shaped, with the pointed end extending nearly to the angles of the hinge-margin, with a central, more sunken, short, rhomboidal ligament-pit which, on a separate valve, forms nearly an equilateral triangle. The anterior and posterior ends are nearly equally curved, a little convex, but slightly narrowed where they join the hinge-margin and form a distinct obtuse angle; on one side, supposed to be anterior, below the angle the margin is slightly incurved for a short distance, making this angle less obtuse than the other. The ventral margin is nearly evenly rounded, forming nearly the segment of a circle. The surface is covered with small, elevated, radial ridges separated by concave grooves of greater breadth; in the middle of the shell between ten and twelve of the ridges are distinctly higher and thicker; on each side their size diminishes outwardly, so that near the angles of the hinge they become nearly or quite obsolete, the last ones being mere raised, microscopic threads; in some cases smaller ones alternate with the larger ones, so that the total number can not be definitely determined, but fifty or more can often be counted. There is often no very evident median external sulcus, such as occurs in several related species, but the two or three central radii are often, but not always, distinctly larger than the rest. The radii are crossed by very fine lines of growth not sufficiently strong to render them at all nodulose. The inner margin is

distinctly crenulated along the prominent ventral edge, the crenulations corresponding to the external grooves and ridges, but at the ends it is smooth. There is often a distinct, median internal groove, extending from near the beak to the middle of the ventral margin, bordered on each side by a distinct raised ridge, sometimes having an additional groove on their outer sides. The hinge-margin is rather thin, nearly straight, and a little excavated or incurved along the ligamental pit; on each side and considerably within the margin there is a small triangular buttress or shelf-like process extending to the anterior and posterior margins as in the allied species, but rather larger than usual.

Length of one of the largest species, 6 mm.; height, 9.6 mm.; thickness, about 5 mm.; length of hinge-margin, 3.6 mm.

A number of separate valves, station 2265, N. lat.  $37^{\circ} 7' 40''$ , W. long.  $74^{\circ} 35' 40''$ , in 70 fathoms, 1884.

This species is allied to *Limatula subovata* (Jeffreys) Smith,<sup>1</sup> which is distinguished by its shorter hinge-margin, more contracted form, with stronger and higher radial ribs and well-marked median sulcus. It also lacks the incurvature of the margins below the angles of the hinge.

#### LIMATULA NODULOSA, new species.

Shell small, nearly equilateral, vertically ovate, narrowed above, with a comparatively short, straight, hinge-margin. Umbos prominent, a little compressed. Beaks small, a little prominent, directly incurved. Surface covered with radial ribs which are very fine and even on the anterior and posterior ends, but in the middle region, become much stronger and are rendered nodulose by strongly marked, raised, concentric lines and grooves. The two median ones are much stronger than the others and are separated by a distinct median sulcus. The inner surface is marked by radial ridges and grooves of which the median ones are much the stronger; inner margin crenulated ventrally by the ends of the ribs and grooves. Ligamental area diamond shape with a small, short, rhomboidal ligament-pit in the middle. The hinge-margin forms an obtuse angle at each end, the two nearly or quite equal; internal buttress well developed with the inner margin regularly curved and continuous across the middle, so as to thicken the hinge in this part.

Length, 4.5 mm.; height, 7 mm.; thickness, about 4 mm.; length of the hinge-margin, 2 mm.

A single valve, among Foraminifera, at station 2385, N. lat.  $28^{\circ} 51'$ , W. long.  $88^{\circ} 18'$ , in 730 fathoms, 1885.

This species agrees with *L. subovata* (Jeffreys) Smith almost completely in size and form, but differs very decidedly in the strong, nodulose, radial ribs which cover the middle portion of the shell.

<sup>1</sup> *Limæa subovata* Verrill, Notice of Recent Add. to Mar. Invert., Pt. 2, Proc. U. S. Nat. Mus., III, p. 402, 1881.

## LIMATULA HYALINA, new species.

Shell small, thin, translucent, vertically ovate, somewhat oblique, and produced postero-ventrally. Hinge-line straight, rather short, forming a well-marked angle at each end owing to the outline of each margin becoming somewhat concave below. Beaks small, acute, incurved. Umbos prominent, smooth, beyond which the shell is covered with numerous, clearly defined, rather sharp radial ridges, separated by wider concave intervals; from twenty to twenty-five of the radii can be easily counted; toward the posterior margin they become faint and indistinct, while the extreme margin, on both sides, is smooth. The anterior margin is broadly rounded and slopes backward below the middle; the posterior margin is nearly straight or even a little incurved in its upper half, but becomes slightly convex below; the ventral margin is evenly rounded and the edge is slightly scalloped by the radial ribs and furrows. There is no distinct median sulcus or larger ribs. The ligamental area is rather short and broad with a relatively large and thick central ligament which occupies a distinctly excavated pit in the hinge-margin.

Length of one of the largest specimens, 4.5 mm.; height, 7.5 mm.; thickness, 3 mm.

A number of live specimens, among Foraminifera, stations 2367 to 2374, N. lat. 29° +, W. long. 85° +, in 25 to 27 fathoms, 1885.

This species somewhat resembles *Limatula confusa* Smith, which was also taken in the north Atlantic and West Indian areas, in 450 to 1,450 fathoms. Our species is, however, more compressed and more oblique, and the radial ribs do not extend to the extreme margins as in the latter. The hinge-margin is also relatively shorter and the ligamental area larger, so that the beaks are more separated.

## Family PECTINIDÆ.

In this family the classification adopted is that proposed by the senior author in a recent paper on the group.<sup>1</sup> We give here a brief abstract of the existing genera and subgenera therein described. For fuller discussions of the characters and interrelations of these groups and illustrations of typical species of most of them, reference should be had to that article.

In the following synopsis the generic groups are arranged in chronological order, without regard to their zoölogical affinities.

<sup>1</sup> "A study of the family Pectinidæ, with a revision of the Genera and Subgenera." By A. E. Verrill, Trans. Conn. Acad. of Sciences, X, pp. 43-95 (six plates), July, 1897.

## PECTEN Müller, 1776.

*Pecten* (1st section) KLEIN, 1753 + *Vola*.

*Pecten* MÜLLER, Prod. Zoöl. Dan., 1776 (*pars*).—DACOSTA, 1778.—BOLTEN, 1798 (restricted).—CUVIER, 1798.—LAMARCK, Syst., 1801.—VERRILL, Trans. Conn. Acad., , pp. 56, 89, 91, 1897.

*Janira* SCHUMACHER, 1817.—DALL, 1886 (*pars*).—FISCHER, 1887.

*Vola* H. and A. ADAMS (after KLEIN), 1858.—STOLICZKA, Mem. Geolog. Survey of India, Cretaceous Pelecypod Fauna, III, p. 426, 1871.—ZITTEL, 1881.

*Vola* + *Janira* CHENU, 1862.

*Type*.—*Pecten maximus* (Linnæus).

Since Bolten, in 1798, definitely restricted the name *Pecten* to this group, his restriction has precedence over that of Schumacher.

The shells are generally large and heavy, and the valves are very unequal, even when very young. The right valve is strongly convex with a large and much incurved umbo and beak, while the left valve is flat or even concave. It is usually smaller than the right, and shuts closely inside of its scalloped margin, and its umbo is nearly or quite obsolete. The auricles are of moderate size and not oblique, and in the right valve they are strongly convex or excurved in the middle. This valve has a sinuous, excurved byssal notch, with obsolete pectinidial teeth. The surface of both valves has strong radial ribs interlocking at the margin. Internally there are angular, thickened, and fluted radial ribs opposite the external grooves; these ribs become more prominent and bicarinate or fluted near the margins.

## AMUSIUM Bolten, 1798.

*Amusium* BOLTEN, 1798.—MUEHLFELDT, 1811.—SCHUMACHER, 1817.—WOODWARD, 1866.—DALL, 1886.—VERRILL, Trans. Conn. Acad., X, pp. 57, 90, 92, 1897.

*Amussium* H. and A. ADAMS, 1858 (*pars*).—STOLICZKA, Mem. Geolog. Survey of India, Cretaceous Pelecypod Fauna, III, p. 426, 1871.—FISCHER, 1887.—ZITTEL, 1881.

*Pleuronectia* SWAIN, 1840.—CHENU, 1862.

*Type*.—*Amusium pleuronectes* (Linnæus).

In this very distinct genus the shell is round, thin, nearly smooth, and strongly compressed. The surface is often polished, sometimes lightly radially striated, never strongly ribbed. The margins are simple and thin. The valves may be a little unequal in convexity and usually differ in color and somewhat in sculpture. The valves come together ventrally, but usually gape at both ends. The auricles are small, symmetrical, nearly equilateral, often with lateral cruræ; the byssal notch is small or absent, pectinidial teeth nearly or quite abortive. The adult probably has no byssus. Hinge-plate simple. Interior of valves strengthened by a number of raised divergent ribs, or liræ, independent of any external sculpture.

## CHLAMYS Bolten, 1798.

*Chlamys* BOLTEN, Mus. Bolt., 1st ed., p. 165, 1798, restricted.—FISCHER, 1887 (*pars*).

*Pecten* SCHUMACHER, 1817 (restricted).—VERRILL, Trans. Conn. Acad., X, pp. 58, 89, 91, 1897.

*Pecten (pars)* and *Chlamys (pars)* H. and A. ADAMS, 1858.—CHENU, 1862.—ZITTEL, 1881.

*Pecten* STOLICZKA, 1871 (restricted).

*Type*.—*Chlamys islandica* (Müller).

The original type of this genus is identical with *P. islandicus* (Müller). Therefore this should be adopted, without question, as the true type, as has been done by Fischer and others.

The typical species of *Chlamys* are high, rounded, somewhat oblique, nearly equivalve shells, with large inequilateral and oblique auricles, a large byssal notch, and several pectinidial teeth. The surface is strongly radially sculptured, with both primary and numerous interpolated ribs, increasing in number with age. The ribs are generally crossed by concentric sculpture, often forming rough, scale-like projections. The margins are scalloped and the shell closes rather tightly except at the byssal area. The inner surface has ribs and double flutings, corresponding to the external grooves and radii. The hinge-plate has generally two slightly divergent ribs on each end.

## PALLIUM Schumacher, 1817.

*Pallium* SCHUMACHER, 1817.—H. and A. ADAMS, 1858.—CHENU, 1862.—STOLICZKA, 1871.—ZITTEL, 1881.—FISCHER, 1887.—VERRILL, Trans. Conn. Acad., X, pp. 59, 89, 91, pl. XXI, fig. 4, 1897.

*Dentipecten* RUPPEL, 1835.

*Type*.—*Pallium plica* (Linnaeus).

The special feature of this very distinct group is the development of several (usually three) well-marked, nearly transverse, blunt teeth, alternating with distinct pits on each end of the hinge-plate. The shell is elevated, rather thick, with external, large, obtuse or rounded radial ribs or corrugations, and with internal, angular, double or bicarinate ribs opposite the external grooves, near the margin. The auricles are small, but high. The hinge-teeth are marked with distinct cross lines.

## HINNITES DeFrance, 1821.

*Hinnites* VERRILL, Trans. Conn. Acad., X, pp. 59, 89, 91, 1897.

*Type*.—*Hinnites cortessi* DeFrance.

Shell free and much like *Chlamys*, when young, but later in life it becomes attached by the right valve and irregular.

## HEMIPECTEN Adams and Reeve, 1849.

*Hemipecten* VERRILL, Trans. Conn. Acad., X, pp. 60, 89, 91, 1897.

*Type.*—*Hemipecten forbesianus* Adams and Reeve.

This group includes species with thin, irregular shells attached by the right valve, like *Hinnites*, but the attachment is effected mainly by a permanent modified byssus. The posterior auricles are nearly obsolete. The byssal notch becomes irregular and nearly inclosed, as in *Anomia*.

## PSEUDAMUSIUM H. and A. Adams, 1858.

*Pseudamusium (pars)* H. and A. ADAMS, 1858 (after KLEIN).—CHENU, 1862.—STOLICZKA, 1871.—ZITTEL, 1881.—FISCHER, 1887.—DALL, 1886 (*pars*).—VERRILL, Trans. Conn. Acad., X, pp. 60, 90, 92, pl. XVII, figs. 8, 8a, 1897 (restricted).

*Type.*—*Pseudamusium exoticum* (Chemnitz, Lamarck).

The typical species of this group have nearly smooth, round, symmetrical, closed shells with well defined, small, straight, obtuse-angled auricles. The valves are nearly equal and have nearly simple, even margins. The external sculpture consists of small radial striae or riblets, without strong angular ribs and grooves, and it may differ on the two valves. Some of the species show the fine divergent "camptonectes sculpture" on one or both valves, especially when young. The margin is not scalloped, or but faintly so, and there are no definite internal ribs. The hinge-plate has usually but one longitudinal fold on each end which is feeble and nearly parallel with the marginal ligamental groove and is usually cross-lined. The byssal notch is small and the pectinidial teeth vary from one up to five in number, or sometimes may be lacking.

## CAMPTONECTES Meek, 1864.

*Camptonectes* MEEK, 1864.—STOLICZKA, 1871.—ZITTEL, 1881 (type, *arenatus* Goldfuss).—VERRILL, Trans. Conn. Acad., X, pp. 62, 90, 91, 1897.

*Type.*—*Camptonectes lens* (Sowerby).

Shell subovate, plain, not corrugated, and without strong radial ribs; margin nearly plain. Valves subequal. Auricles unequal; byssal notch well developed. Surface of the shell covered with fine, obliquely divergent, curved, crenulated or vermiculated riblets with intervening, narrow, punctate grooves.

The curious vermiculated sculpture is not peculiar to this division, but is more or less obvious on the shells of some species of *Pseudamusium*, and on species of several other groups, both with and without radial ribs. It is a structural feature that runs obliquely across the ribs and grooves. Most of the species are Mesozoic fossils.

The recent *Pecten striatus* and *P. tigrinus* Lamarck, of Europe, apparently belong to this group, and *P. testæ* might also well be referred to it. The latter is one of the types of *Palliolium* which might well be regarded as a section of this genus.

## LYROPECTEN Conrad, 1867.

*Lyropecten* of several later authors.

*Lyropecten* CONRAD, 1867.—VERRILL, Trans. Conn. Acad., X, pp. 63, 89, 91, 1897.

*Type.*—*Lyropecten nodosus* (Linnæus).

Shell large and strong, corrugated, with large, fluted, and usually nodose, primary radial ribs, which do not increase in number, and with coarsely scalloped margins. Valves somewhat unequal. Auricles of medium size, unequal. Hinge-plate with several, usually three, oblique, divergent ribs on each end. This is one of the best defined groups, and may be regarded as of generic value. It is allied to *Pallium*.

## PROPEAMUSIUM Gregorio, 1883.

*Propeamusium* (subgenus) DALL, Bull. Mus. Comp. Zool., XII, p. 210, 1886.—FISCHER, 1887.—(genus) VERRILL, Trans. Conn. Acad., X, pp. 64, 90, 92, pl. XX, figs. 5-9, 1897.

*Type.*—*Propeamusium inequisculpta* (Tiberi) = *Propeamusium fenestratum* (Forbes).

This group is allied to *Amusium*. It includes small, mostly deep-sea species, with thin, rounded shells, having the valves unequal in size and sculpture; the lower and flatter one is concentrically grooved, and usually turns up at the thin margin to meet the upper valve, as in *Cyclopecten*. The upper valve may be cancellated or radially sculptured. When full grown there are several well-formed, raised, internal ribs; these may be absent in the young.

This division differs from *Amusium* in the sculpture of the valves and in having the auricles and byssal notch well developed.

The species closely resemble those of *Cyclopecten*; the only obvious difference in the shells is in the presence of internal ribs.

## PALLIOLUM Monterosato, 1884.

*Palliolum* (subgenus or section) VERRILL, Trans. Conn. Acad., X, pp. 65, 90, 91, pl. XVIII, figs. 6-14, 1897.

*Types cited.*—*Palliolum testæ* (Bivona) and *Palliolum vitreum* (Chemnitz).

This group is separated from *Pseudamusium* H. and A. Adams, and can scarcely be distinguished from *Camptonectes* by any known characters.

The two species named by its author as types agree in having thin, rounded, nearly equivalved shells, with the posterior auricle poorly developed, and with fine camptonectes sculpture on both valves, with small radial riblets, and usually with rows of small scales. The margins are plain and come evenly together, without flattening.

## ÆQUIPECTEN Fischer, 1887.

*Æquipecten* (subgenus of *Chlamys*) VERRILL, Trans. Conn. Acad., X, pp. 59, 67, 89, 91, pl. XVI, figs. 6-11; pl. XX, figs. 1-3, 6, 6a, 1897.

*Type.*—*Æquipecten opercularis* (Linnæus).

Shell broadly rounded, with the valves nearly equal and symmetrical. Auricles well-formed, angular; byssal notch well-developed. The sculpture consists of a moderate number of large and nearly equal primary radial ribs, which increase in size, but are not much increased in number with age, by the interpolation of new ones. Internal ribs or flutings correspond to external grooves, but each one is bicarinate or double, especially near the margins. Hinge-plate with one or two slightly divergent ribs at each end, often crossed by strong transverse incisions. Pectinidial teeth abortive in the type, but present in most species. The foot of the type species is subcylindrical, well-developed, with a byssal fissure and a terminal, deeply bilobed "scooped-shaped" disk, which can be expanded. In *Æ. irradians*<sup>1</sup> the foot has a similar structure, but the terminal disk appears to be smaller.

## PECTINELLA Verrill, 1897.

*Pectinella* VERRILL, Trans. Conn. Acad., X, pp. 68, 90, 92, 1897.

*Type.*—*Pectinella sigsbei* (Dall).

Shell small, thin, swollen, nearly smooth, with convex and slightly unequal valves. Auricles very unequal, oblique, the anterior larger, with a deep byssal notch in the right valve, but without pectinidial teeth; posterior auricle small. The surface is smooth except for fine lines of growth. *Camptonectes* sculpture is not present. The texture is not hyaline.

The only known species is *Pectinella sigsbei* (Dall)<sup>2</sup> which was taken by the *Blake* Expedition in the West Indies, in 158 fathoms.

## LISSOPECTEN Verrill, 1897.

*Lissopecten* (subgenus of *Chlamys*) VERRILL, Trans. Conn. Acad., X, pp. 68, 90, 91, 1897.

*Type.*—*Lissopecten hyalinus* (Poli).

Shell slightly inequivalve, broadly rounded, not oblique, thin, translucent, nearly smooth. The external sculpture consists of faint, nearly obsolete radial ridges and obscure riblets, but one or both auricles may have a more or less cancellated sculpture. The interior sculpture consists of very distinct, simple, raised ribs. Auricles angular, well-developed. Byssal notch deep. Pectinidial teeth prominent. Margin not scalloped, nearly plain and simple.

<sup>1</sup> Trans. Conn. Acad., X, pl. xx, fig. 6.

<sup>2</sup> Bull. Mus. Comp. Zoöl., XII, p. 223, pl. IV, fig. 2, 1886.

Although this group agrees with *Amusium* in having internal ribs without corresponding external grooves, it seems to be allied rather to *Chlamys*. It may be regarded as a division of the latter in which the external radial ribs have degenerated.

LEPTOPECTEN Verrill, 1897.

*Leptopecten* (subgenus of *Chlamys*) VERRILL, Trans. Conn. Acad., X, pp. 69, 89, 91, 1897.

*Type.*—*Leptopecten monotimeris* (Conrad).

Shell thin, translucent, oblique, broadly rounded, with strong, rounded radial ridges or folds, like corrugations, which appear in reverse on the interior surface. The internal ribs are not angulated by a deposit of shell, nor distinctly thickened. Margin with broad scallops. The exterior surface is covered with fine divergent camptonectes sculpture, both on the ribs and intervals. The ribs do not increase in number with age but become broader and more flattened. Auricles large and broad, thin, corrugated. Byssal notch large and deep. Pectinidial teeth prominent. Hinge-plate thin and but little differentiated. Cardinal ridge thin and small, close to the ligament, crossed by fine incisions.

PLACOPECTEN Verrill, 1897.

*Placopecten* (subgenus of *Chlamys*) VERRILL, Trans. Conn. Acad., X, pp. 69, 89, 91, pl. xviii, figs. 1-7; pl. xx, figs. 7, 8, 8a; pl. xxi, figs. 1-2a, 1897.

*Type.*—*Placopecten clintonius* (Say).

Shell large, compressed, broadly rounded, rather thin, with simple sharp edges, meeting evenly ventrally, but gaping considerably at both ends, especially when adult. Valves only slightly unequal in form, the right one being a little flatter, but they differ in color and somewhat in sculpture, the right one being smoother and paler. Both have fine radial lines or riblets, and they have vermiculated divergent riblets when young. Auricles small, symmetrical, nearly equal. Byssal notch small, simple. Pectinidial teeth generally obsolete, except when young. No internal ribs. Inner surface often with more or less pearly luster and a crystalline structure. Hinge-plate with two feeble, slightly divergent ribs on each end, crossed by fine transverse incisions. The foot<sup>1</sup> is well developed, oblique, slightly narrowed distally and enlarged at the end, where it is divided into two lobes by a rather deep, oblique, longitudinal fissure, so that the lobes can be spread apart or closed at will, thus resembling somewhat the foot of *Ledida*. Toward the base, on the anterior side, there is also a short, deep byssal slit, terminating at a prominent tubercle about the middle of the front side.

<sup>1</sup>Trans. Conn. Acad., X, pl. xx, fig. 8.

## CYCLOPECTEN Verrill, 1897.

*Cyclopecten* VERRILL, Trans. Conn. Acad., X, pp. 70, 90, 92, pl. XVI, fig. 1; pl. XIX, figs. 1-4, 1897.

*Types.*—*Cyclopecten pustulosus* Verrill and *Cyclopecten imbrifer* (Lovén).

Shells thin, rounded, scarcely oblique, with symmetrical auricles and simple margins. The two valves are unlike in sculpture. The right valve is a little flattened and upturned at the flexible margin, so as to fit tightly against the upper valve. The thin lower valve has, in the typical species, regular, thin, elevated, concentric lamellæ, which aid in the adaptation of the edge to that of the upper valve; the margin is usually flattened or bevelled. The upper (left) valve is radially sculptured, rarely smooth; it usually has radial rows of arched scales, pustules, or points, and also concentric raised lines; it is sometimes cancellated. No radial ribs, nor interlocking points at the margin. Auricles well-developed, subequal, angulated and well-defined at both ends; byssal notch well-defined; few or no pectinidial teeth. Cardinal folds single, rather feebly developed, often cross-lined. Eyes few. Byssus small, and of few threads.

This genus includes a large number of small species, mostly from deep-water.

## HYALOPECTEN Verrill, 1897.

*Hyalopecten* VERRILL, Trans. Conn. Acad., X, pp. 71, 90, 92, pl. XVIII, fig. 5, 1897.

*Type.*—*Hyalopecten undatus* Verrill.

Shell compressed, thin, hyaline. Valves nearly equal, with concentric undulations or corrugations, affecting the entire thickness; margins simple; sculpture none, or consisting of fine radial lines on one or both valves, without camptonectes sculpture. Hinge-plate thin and nearly plain; auricles well-developed, unequal; byssal notch distinct.

For the possible relations of this group to the Mesozoic genus, *Synyclonema*, see the original article.

The species recorded are as follows: *H. dilectus* Verrill and Bush, from 1,813 fathoms, off Marthas Vineyard; *H. fragilis* (Jeffreys), from northern Europe and the Arctic Ocean, and off the United States coast, in 578 to 1,525 fathoms; *H. undatus* Verrill, off the United States coast, in 1,423 fathoms; and *H. pudicus* (Smith), off Marion Island, in 1,375 fathoms.

## PARAMUSIUM Verrill, 1897.

*Paramusium* VERRILL, Trans. Conn. Acad., X, pp. 72, 90, 92, 1897.

*Type.*—*Paramusium dalli* (Smith).<sup>1</sup>

Shell thin, rounded, much compressed; valves nearly equal; sculpture nearly obsolete, different on the two valves; the lower valve with concentric undulations. Auricles very small, equal. Byssal notch and

<sup>1</sup>*P. dalli* ranges from the Gulf of Mexico to Barbados, in 218 to 1,591 fathoms.

pectinidial teeth obsolete. The shell has a prismatic structure. Internal liræ and auricular cruræ well-developed.

The structure of the animal was described by Mr. Dall as very different from that of typical *Amusium*. According to his description it has a single pair of gills, with long, simple, separate filaments. The foot is slender, with a byssal groove; the end is much enlarged, with an oblique, expanded, concave terminal disk, striated within. No labial palpi. Ocelli without pigment.

A specimen, well preserved in alcohol, examined by us, had two rows of long, slender, reflected gill-filaments, as usual in this family. They were attached to a broad basal membrane, with a free, lanceolate, posterior portion. Two pairs of broad, foliaceous, incurved palpi, tinged with dark brown. Those of the anterior pair are united into a hood over the mouth; the others are smaller, curved inward, somewhat lanceolate at the tips. No ocelli could be found. The pallial tentacles are all in one row, numerous, of various sizes; from four to six large ones, with as many alternating small ones, correspond to each larger undulation or scallop of the mantle-margin. No guard-tentacles. Muscular pallial border is broad, thickened, radially striated, forming a ridge, as preserved, but not tentaculated. Free portion of rectum long and slender.

A synopsis of the Pectinidæ was recently published by Dr. Frederico Sacco.<sup>1</sup>

He recognized three genera: *Chlamys*, *Amusium*, and *Pecten*, with the same types given by Verrill. Under *Chlamys* he gives nine subgenera. Of these, four—*Chlamys* (restricted), *Hinnites*, *Æquiptecten*, and *Palliolum*—correspond with the groups of the same name given by Verrill; *Felipès* Locard (type, *pesfelis* L.), *Peplum* Bucquoy, Dantzenberg, and Dollfus, 1889 (type, *inflexum* Poli), *Macrochalmis* Sacco, 1897 (type, *latisima* Brocchi), *Flexopecten* Sacco, 1897 (type, *flexuosus* Poli), *Lissochlamis* Sacco, 1897 (type, *excisa* Bronn), are additional to those given by Verrill.

Under *Amusium* he has, besides the typical group, four subgenera. Of these, two are new—*Parvamusium* Sacco, 1897 (type, *duodecimlamellatum* Bronn), *Variamusium* Sacco, 1897 (type, *cancellatum* Schmidt). The two others are *Propeamusium* and *Pseudamusium*.

The three new subgenera of *Pecten* are *Amussiopecten* Sacco, 1897 (type, *burdigalensis* Lamarck); *Oöpecten* Sacco, 1897 (type, *rotundatus* Lamarck); and *Flabelliptecten* Sacco, 1897 (type, *flabelliformis* Brocchi).

<sup>1</sup> Bolletino dei Mus. Zool. ed Anat. Comp., Univ. di Torino, XII, p. 101. It was apparently issued at about the same time as that by Professor Verrill, here abstracted.

## CHLAMYS BENEDICTI Verrill and Bush.

(Plate LXXXIV, figs. 1, 2.)

*Chlamys benedicti* VERRILL and BUSH, in VERRILL, Trans. Conn. Acad., X, pp. 74, 91, 1897.

Shell small, higher than long; anterior auricle much larger than the posterior, with a deep byssal notch in the lower or right valve. The dorsal margin is straight and but slightly oblique; the posterior auricle in the right valve is decidedly angular, with its outer end slightly incurved and serrated by the termination of the radial ribs; the anterior auricle is considerably prolonged, angulated at the upper corner, obtusely rounded at the end and deeply notched where it joins the main shell; it has four strongly marked radiating ribs, besides the dorso-marginal fold; below these there is a slightly concave space corresponding to the byssal notch; on the body of the shell there are from four to seven sharp serrations along the lower margin of the notch. In the upper valve the anterior auricle is broad and decidedly angular, the dorsal and outer margins forming less than a right angle; its surface is covered with five or six strong radiating ribs decussated by more numerous, finer, concentric raised lines. The anterior and posterior margins of the body of the shell slope about equally and form an acute angle; the ventral margin forms a regular semicircular curve. The entire surface in both valves is crossed by strongly raised, rather close, radiating ribs separated by rather wide, deep grooves and are decussated by regular, raised, concentric lines, which are scarcely apparent on the ribs, except on very young shells, but there are rather strong, elevated, spine-like points arranged along the ribs in pretty regular, concentric lines, especially near the margins; these become higher and more pointed anteriorly and are frequently nearly obsolete in the middle portion of the lower valve; the ribs project at the margin as blunt points or serrations; on the inner surface there are radial grooves corresponding to the external ribs. The hinge-margin is thin, with a slender ligamental, submarginal groove and a small, triangular resilial pit in the center. The color is variable; the single valve from station 2571 is uniform lemon yellow; those from the other locality are chestnut or reddish brown and variegated with paler and sometimes white blotches.

Length of the largest specimen, 5.5 mm.; height, 6 mm.; length of dorsal margin, 4 mm.

A few live young specimens, among Foraminifera, stations 2369 to 2374, in 25 to 27 fathoms, and a single valve, station 2571, in 1,356 fathoms, 1885.

This species is a typical *Chlamys*, allied to *C. varia* of Europe, but when compared with young of that species of the same size the radial ribs are found to be fewer and coarser, and there are other differences which render it probably that they are distinct. It differs from the young of *C. islandica* in the number of ribs and shape of the auricles.