LEDA PERNULA (Müller).

(Plate LXXXII, fig. 2.)

Leda pernula G. O. SARS, Mollusca Reg. Arcticæ Norvegiæ, p. 35, pl. 5, figs. 1 *a–d*, 1878.—JEFFREYS, Proc. Zoöl. Soc., London, p. 574, June, 1879.—VERRILL, Proc. U. S. Nat. Mus., III, p. 401, 1881; Trans. Conn. Acad., V, p. 572, 1882; not VI, p. 280, pl. XXX, figs. 14, 14*a*, 1884.—Not DALL, Bull. U. S. Nat. Mus., No. 37, pl. XLV, figs. 14, 14*a*, 1889.

Found at a number of stations between N. lat. 46° 23′, W. long. 52° 45′, and N. lat. 37° 8′, W. long. 74° 33′, in 25 to 471 fathoms, 1872–1885.

LEDA CAUDATA (Donovan).

(Plate LXXXII, fig. 1.)

Arca caudata DONOVAN, British Shells, pl. LXXVIII; Chenu ed., p. 50, pl. XVII, figs. 8–12.

Leda caudata LOVÉN, Ind. Moll. Scand., p. 34.—GOULD, Rep. on Invert. of Mass., Binney's ed., p. 165, fig. 471, 1870.—TRYON, Amer. Mar. Conch., p. 182, pl. XXXVIII, figs. 494, 495, 1873.

Leda pernula VERRILL, Trans. Conn. Acad., V, p. 572, 1882, in part; VI, p. 280, pl. XXX, figs. 14, 14*a*, 1884.—DALL, Bull. U. S. Nat. Mus., No. 37, pl. XLV, figs. 14, 14*a*, 1889.—(?) BUSH, Bull. Mus. Comp. Zoöl., XXIII, p. 234, 1893.

Leda caudata VERRILL and BUSH, Amer. Journ. Sci., III, p. 54, fig. 19, January, 1897.

This deeper-water form, previously identified as *Leda pernula*, was found at a very few stations between N. lat. 42° 57′, W. long. 69° 50′, and N. lat. 37° 16′ 30″, W. long. 74° 20′ 36″, in 102 to 641 fathoms, 1874–1885.

LEDELLA Verrill and Bush, 1897.

Junonia SEGUENZA, Nuculidi terziarie merid. d' Ital., R. Acad. Lincei, p. 1175, 1877 (not of HÜBNER).

Ledella VERRILL and BUSH, Amer. Journ. Sci., III, pp. 54, 62, January, 1897.

Type.—*Ledella messanensis* (Seguenza).

This group includes a large number of small species, both living and fossil, in which the shell is rather short, usually ovate or swollen, with a small, acute or subacute unicariate rostrum, situated medially or submedially, and defined below by an emargination or undulation in the postero-ventral margin. The postero-dorsal margin is convex. The escutcheon or ligamental area is very distinctly defined by the carina, but is not sunken. The chondrophore is usually small but distinct. The siphon tubes are separate, at least in some species. It includes numerous minute tertiary species referred by Seguenza to the section of *Leda* named by him *Junonia*, and also a considerable number of recent deep-water species generally described by authors under *Leda*. As the name *Junonia* was preoccupied, the group, which seemed to be of generic value, required a new name.

The following species appear to belong here:

L. seminula (Seguenza), *L. nicotræ* (Seguenza), *L. peraffinis* (Se-

guenza), *L. rectidorsata* (Seguenza), *L. confusa* (Seguenza), fossil; *L. solidula* (Smith) and *L. semen* (Smith), from off Brazil; *L. confinis* (Smith), off the Azores; *L. inopinata* (Smith), *L. prolata* (Smith), and *L. ultima* (Smith), from the Pacific; *L. messanensis* (Seguenza), from off the Barbados, northward; *L. messanensis* (Seguenza) var. *sublevis* Verrill and Bush, off Delaware Bay, northward; and *L. parva* Verrill and Bush, off Marthas Vineyard.

LEDELLA MESSANENSIS (Seguenza).

(Plate LXXXI, fig. 9.)

Leda acuminata JEFFREYS, Ann. Mag. Nat. Hist., p. 69, July, 1870 (not VON BUCH).—SEGUENZA, Nuculidi terziarie merid. d'Ital., R. Acad. Lincei, 1877, p. 1175, pl. III, figs. 15, 15*a*, 15*e*.

Leda messanensis JEEFREYS, Proc. Zoöl. Soc. London, p. 576, June, 1879.—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XIII, p. 237, 1885.—DALL, Bull. Mus. Comp. Zoöl., XII, p. 249, 1886; Bull. U. S. Nat. Mus., No. 37, p. 44, 1889.

The shell which is here regarded as the true *messanensis* is small, swollen, ovate, nearly equilateral, with a distinct, short, oblique rostrum bent downward at the tip and separated from the body of the shell by a distinct depression and marginal indentation. The shell is thick and solid for so small a species; its surface is covered with fine, regular, raised, thin, concentric lines separated by wider concave grooves. The hinge-margin is thick, strong, with about seven or eight, mostly strong, nearly erect, and not crowded, teeth in each series. The chondrophore is relatively large, triangular, and projects on the inner margin. The epidermis is pale yellow. According to Jeffreys the siphon tubes are long and separate.

Length, about 2.6 mm.; height, about 2 mm.

A few specimens, at three stations between N. lat. 38° 29′, W. long. 73° 9′, and N. lat. 37°, W. long. 71° 54′, in 965 to 2,620 fathoms, 1884–85. South to the Barbados, in 32 to 2,033 fathoms.—Dall.

LEDELLA MESSANENSIS (Seguenza) variety SUBLEVIS, new.

(Plate LXXXI, fig. 7.)

Yoldia messanensis, variety VERRILL, Trans. Conn. Acad., VI, pp. 227, 280, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 576, 1885.

Ledella messanensis, variety VERRILL and BUSH, Amer. Journ. Sci., III, p. 60, fig. 13, January, 1897.

This variety differs from the form above described, principally in having the concentric sculpture wholly or partially obsolete and in its somewhat more elongated form. It has nine or ten teeth in each series, due perhaps to the larger size of the specimen.

Comparatively few specimens, at thirteen stations, between N. lat. 42° 47′, W. long, 61° 4′, and N. lat. 38° 20′, W. long. 70° 8′ 30″, in 1,188 to 2,033 fathoms, 1883–1886.

LEDELLA PARVA Verrill and Bush.

(Plate LXXXI, fig. 1.)

Ledella parva VERRILL and BUSH, Amer. Journ. Sci., III, p. 54, fig. 18, January, 1897.

Shell minute, narrow-ovate, the anterior end the longer and obtusely rounded, and the posterior end with a short, subtruncate, median rostrum. Umbos somewhat swollen; beaks a little prominent and turned slightly backward. The surface is nearly smooth, showing only microscopic lines of growth. The antero-dorsal margin is elongated, slightly convex, and slopes very gradually to the rounded anterior end; the ventral margin is broadly and evenly convex, but somewhat pinched up posteriorly to form a slight emargination below the rostrum, which is short, narrow, subtruncate at the tip, and is defined by a slight, inconspicuous ridge; the postero-dorsal margin is nearly straight and slopes rapidly to the upper angle of the rostrum. The hinge-plate is strong, considerably thickened, with a very obtuse angle at the beak; the anterior portion is the longer with the inner margin convex, and the posterior portion is the wider, more oblique, with the inner margin strongly concave; the plain outer margin is sharp and projects considerably above the teeth which are strong, stand nearly erect, and are less V-shaped than usual. There are about fifteen in the anterior series, of which three or four proximal ones are quite small, and nine stouter ones in the posterior series, including one very small one next the beak. The chondrophore is rather small and deep with a distinctly projecting inner edge.

Length, 3 mm.; height, 2 mm.

One valve (No. 78365), station 2689, off Marthas Vineyard, in 525 fathoms, 1886.

This species seems to be closely allied to *L. semen* (Smith) from off the coast of Brazil (Voyage of the *Challenger*), but that species, although of the same size, has fewer teeth, nine of which are said be anterior and twelve posterior.

PORTLANDIA Mörch, 1857.

Portlandia VERRILL and BUSH, Amer. Journ. Sci., III, pp. 54, 62, January, 1897.

Type.—Portlandia arctica (Gray) 1819 = *Leda portlandica* (Hitchcock).

We consider this a distinct genus, but would restrict it to the original type, unless a few species, which we have not seen, should prove to belong to it. In any case it does not appear that any of the northern species of Europe and America that have been referred to it are really closely allied to the type. In many respects this genus is intermediate between *Leda* and *Yoldia*. In its closed shell, definite rostrum, etc., it agrees more nearly with the former, but in general outline, with the latter.

YOLDIA Möller, 1842.

Yoldia VERRILL and BUSH, Amer. Journ. Sci., III, pp. 55, 62, figs. 12, 16, January, 1897.

Type.—*Yoldia hyperborea* Torrell = *Yoldia arctica* Möller (not Gray).

We have restricted this genus to the typical forms, such as *Y. limatula* (Say), *Y. sapotilla* (Gould), *Y. myalis* (Couthouy), and many closely allied foreign species.

These have a nearly smooth, compressed, lanceolate, gaping shell, more or less prolonged and tapered posteriorly, with a poorly defined, wide rostrum, generally without carinations. The external ligament is marginal, feebly developed, continuous under the beaks, and not much differentiated from the general epidermis. The chondrophore is large, concave, and projects within the margin. The pallial sinus is large and deep. The siphon tubes and posterior pallial tentacle are long. The palpal tentacles are long and tapered; in life they may extend nearly to the end of the expanded siphon.

ADRANELLA, new subgenus of Yoldia.

Type.—*Adranella casta*, new species.

This subgenus is allied to *Yoldia*, but is distinguished by its oblong-ovate, compressed form, with a broadly rounded, posterior end, having a very small, nearly obsolete, rostrum. Surface sculptured with distinct, raised, concentric lines. Hinge-plate and teeth strong. Resilium occupying a distinct pit in the apex of a large shelf-like, triangular chondrophore.

YOLDIA (ADRANELLA) CASTA, new species.

(Plate LXXX, fig. 4.)

Shell small, oblong-ovate, somewhat compressed, inequilateral, with the posterior end a little the longer and considerably the broader. Umbos small; beaks curved inward and slightly backward. Antero-dorsal margin slightly concave near the beak, a little convex opposite the distal teeth; anterior end a little narrowed, obtusely rounded; ventral margin broadly and evenly rounded with a very faint undulation posteriorly; postero-dorsal margin a little convex, sloping less than the anterior, and turning up at the end so as to form a slight, hardly distinct rostrum. The hinge-plate is rather large and thick, especially distally on each side, becoming narrow and turning upward at the beak, where it is interrupted by a small, rather deep resilial pit, which is bordered interiorly by a thickened extension of the hinge-margin forming a sort of shelf, the whole constituting a broadly triangular chondrophore with the pit near its apex. The anterior series of teeth contains twelve, of which three or four proximal ones are very small, and form a series which curves upward, exterior to the chondrophore, and terminates at the superior margin of the shell; the teeth

become large, strong, and thick distally, with broad V-shaped bases separated by deep pits. In the posterior series, which is a little the longer, there are eleven teeth corresponding in form and arrangement with those of the anterior series. The exterior surface is regularly sculptured with prominent, sharp, concentric, raised lines separated by wider intervals. Interior very glossy. Muscular scars and pallial line not visible. Exterior sculpture clearly seen through the shell.

Length, 4.2 mm.; height, 2.8 mm.

One valve, among Foraminifera, station 2150, N. lat. 13° 34′ 45″, W. long. 81° 20′ 10″, in 382 fathoms, 1884.

ORTHOYOLDIA Verrill and Bush, 1897.

Orthoyoldia VERRILL and BUSH, Amer. Journ. Sci., III, pp. 55, 62, January, 1897.

Type.—Orthoyoldia scapina (Dall).

Shell oblong, gaping, blunt or rounded at both ends, without a distinct rostrum; no carina. Pallial sinus large and broad. Teeth numerous in both series. *O. scapina* (Dall), from off Brazil and *O. solenoides* (Dall) from the West Indies.

MEGAYOLDIA Verrill and Bush, 1897.

Megayoldia VERRILL and BUSH, Amer. Journ. Sci., III, pp. 55, 62, fig. 17, January, 1897.

Type.—Megayoldia thraciæformis (Storer).

We have established a new generic group for this large and well-known species, which has sometimes been referred to *Yoldia* and sometimes to *Portlandia*. No closely allied species is known. It is probably the largest known species of this family and is remarkable for its broad, short, compressed form, with a very short, blunt, indefinite, postero-dorsal rostrum, and with a low radial ridge, ending in a postero-ventral marginal lobe. The chondrophore is remarkably large and strong, concave, striated within, and projects much within the margin of the hinge-plate. The pallial sinus is large and deep. In outline it somewhat resembles typical *Portlandia*, but differs in being broader, flatter, and gaping at both ends, and in having a strongly developed external ligament. From *Yoldia* it also differs in the last character, as well as in outline, but agrees with it in its compressed gaping shell.

The postero-ventral margin of the mantle forms a pouch-like protrusion, corresponding to the radial ridge. The siphon tubes are long and united; the posterior pallial tentacle is long and slender. The palpi are very large. The palpal tentacles originate from the body-wall at the base of the outer palpi; they are long and thick, with a large furrow on one side.

MICROYOLDIA Verrill and Bush, 1897.

Microyoldia VERRILL and BUSH, Amer. Journ. Sci., III, pp. 56, 62, January, 1897.

Type.—Microyoldia regularis (Verrill).

Shell small, tightly closed, veneriform, with the anterior end shortest and with the beaks turned forward. A posterior marginal ligament in a distinct groove, continued under the beaks. Hinge-plate and teeth rather strong; the anterior series of teeth the shorter, forming a marked angle with the posterior series. Resilium supported by a relatively large and strong chondrophore, placed on the surface of the hinge-plate, distinctly behind the beaks and at the proximal end of the posterior series of teeth. Pallial line indistinct.

The curious little shell for which this genus is proposed is remarkable for its form and the size and position of the cartilage and chondrophore, as well as for its few blunt teeth. If we are correct in our conclusions as to the anterior and posterior ends, the beaks turn forward as in *Tindaria.* The principal reason for considering the longer end posterior is the existence of a well-formed ligament and groove along that end and not on the shorter one.

MICROYOLDIA REGULARIS (Verrill).

(Plate LXXVIII, figs. 5, 6.)

Yoldia regularis VERRILL, Trans. Conn. Acad., VI, pp. 228, 279, 1884.
Microyoldia regularis VERRILL and BUSH, Amer. Journ. Sci., III, p. 56, figs. 5, 6, January, 1897.

This species closely resembles the very young of *Megayoldia thraciæformis* (Storer) Verrill and Bush, in the character of the hinge. Specimens of the latter measuring 3.5 mm. in length have the relatively large, concave, cartilage-plate just before the beaks, which curve strongly backward and are nearer the center of the shell, and the teeth are more numerous and more slender.

In *M. regularis* the shell is cordate-ovate or veneriform. The beaks curve strongly toward the short (anterior ?) end. There is on this end a sunken lunular area defined by a slight groove which indents the hinge-margin. The anterior (?) part of the hinge-margin is thickened and incurved along the lunule and bears an inner ridge and four or five, small, blunt teeth of which the proximal two project above the margin in a dorsal view, the others are low and rather obscure. Under the beak the hinge-plate is thickened, sinuous, edentulous for a short distance; back (?) of this there is a large, thick, oblique, concave chondrophore which occupies the whole breadth of the hinge-margin and projects inward beyond it as a shelf-like border; beyond this there is a series of six or seven prominent, blunt teeth. The external ligament lies in a distinct grove along a large part of the edge of the longer (posterior?) dorsal margin and runs under the beak, but fades out in front of it. The pallial sinus is not visible, consequently it is not possible to decide which is the anterior end.

But one specimen from station 199, off Thatchers Island, in 98 fathoms, 1878, has been referred to this species, besides the type specimens (No. 38420) station 1093, off Marthas Vineyard, in 349 fathoms, 1882.

YOLDIELLA Verrill and Bush, 1897.

Yoldiella VERRILL and BUSH, Amer. Journ. Sci., III, pp. 55, 63, January, 1897.

Type.—*Yoldiella lucida* (Lovén).

This group includes a large number of small, mostly deep-sea species with glossy, iridescent, ovate, and usually wedge-shaped shells, nearly always having a slight antero-ventral sinuosity, which feebly defines an obscure, blunt, rostal region, without any definite carination. The shells do not gape, but close tightly except that at the rostral angle of some species there may be a slight divergence. The internal cartilage, which is often relatively large, occupies a simple notch which interrupts the hinge-margin more or less completely and generally shows externally in a dorsal view; the notch usually terminates within, on the inner or inferior surface of the hinge-plate and is often bounded within by a slight ridge. A weak external ligament is present on the postero-dorsal margin. A relatively small pallial sinus has been observed in several of the species, but is usually indistinct. The siphon tubes, as observed in a few of the species, are slender and united for more than half their length.

The following are some of the species: *Y. lucida* (Lovén) Verrill and Bush, *Y. iris* Verrill and Bush, and var. *stricta* Verrill and Bush, *Y. inflata* Verrill and Bush, *Y. inconspicua* Verrill and Bush, and *Y. jeffreysi* (Hidalgo) Verrill and Bush, off Cape Hatteras, North Carolina, northward; *Y. dissimilis* Verrill and Bush, north of Cape Hatteras, North Carolina, northward; *Y. fraterna* Verrill and Bush, off Chesapeake Bay, northward; *Y. minuscula* Verrill and Bush, and *Y. subequilatera* Verrill and Bush, off Delaware Bay, northward; *Y. frigida* (Torell) Verrill and Bush, and *Y. curta* Verrill and Bush, off Marthas Vineyard, northward; *Y. subangulata* Verrill and Bush, and *Y. lenticula* (Möller) Verrill and Bush, var. *amblia* Verrill and Bush, Gulf of Maine; *Y. expansa* (Jeffreys) Verrill and Bush, off Grand Banks; *Y. pachia* Verrill and Bush, southern; *Y. hoylei* (Smith) Verrill and Bush, North Pacific.

YOLDIELLA LUCIDA (Lovén) Verrill and Bush.

(Plates LXXVII, fig. 2; LXXX, fig. 3.)

Yoldia lucida LOVÉN, Index Molluscorum, p. 34, 1846.

?*Leda obesa* STIMPSON, Proc. Boston Soc. Nat. Hist., IV, p. 113, 1851; Shells New Eng., p. 10, pl. II, fig. 1, 1851.

Leda lucida JEFFREYS, British Conchology, V, p. 173, pl. C, fig. 1, 1869.

Yoldia obesa GOULD, Rep. on Invert. of Mass., Binney's ed., p. 155, fig. 463, 1870.

Leda obesa TRYON, Amer. Mar. Conch., p. 184, pl. XXXVIII, figs. 500, 501, 1873.

Yoldia obesa VERRILL, Amer. Journ. Sci., VII, pp. 46, 412, 503, 1874.—SMITH and HARGER, Trans. Conn. Acad., III, pp. 18, 23, 1874.—VERRILL, Explorations Casco Bay, pp. 352, 368, 1874; Invert. Anim. Vineyard Sd., p. 396, 1874.

Portlandia lucida G. O. SARS, Mollusca Reg. Arcticæ Norvegiæ, p. 37, pl. 4, figs. 8*a*, 8*b*, 1878.

Leda lucida JEFFREYS, Proc. Zoöl. Soc., London, p. 578, 1879.

Yoldia lucida VERRILL, Trans. Conn. Acad., V, pl. XLIV, fig. 1, 1882; VI, p. 279, 1884 (in part); Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 576, 1885 (in part).—BUSH, Bull. Mus. Comp. Zoö. l, XXIII, p. 233, 1893.

Yoldiella lucida VERRILL and BUSH, Amer. Journ. Sci., III, p. 55, fig. 14, January, 1897.

Shell small, swollen, subovate, with a posterior angle, smooth, or more or less striolate, iridescent. The umbos are but little prominent, in front of the middle; the beaks interrupted or obliterated by the dark central cartilage which occupies a relatively large notch intersecting the entire thickness of the hinge-margin. The antero-dorsal margin is convex with the edge a little expanded; it slopes rapidly from the beak to the anterior end which is obtusely rounded; the ventral margin is broadly and regularly curved nearly to the posterior end where there is a slight protrusion corresponding to a faint undulation of the surface; the posterior end is somewhat wedge-shaped, a little compressed and tapered, and makes a distinct but obtuse angle where it joins the dorsal margin in line with a rounded posterior ridge running from the convex part of the umbos; just below the angle the margin is usually convex or subtruncate and without any definite lower angle; the posterior dorsal margin slopes less rapidly than the anterior, is nearly straight with the edge compressed and a little expanded into a thin keel which is usually slightly convex in the middle. The hinge-margin is strong, somewhat prolonged, scarcely angulated in the middle; the part in front of the chondrophore is well-arched and bears, in the largest specimens, nine or ten, sharp, prominent, angular teeth, of which two or three nearest the beak are quite small; the posterior portion is nearly straight, a little longer and narrower than the anterior and bears about eleven thin, sharp, erect teeth, counting one or two minute proximal ones; a thin smooth margin extends outside both series of teeth. The cartilage-pit is relatively large, in the form of a notch, and cuts through the hinge-margin into the substance of the beak itself; it is occupied by a dark brown resilium which usually shows plainly externally. Just in front of the cartilage-pit on its border within the series of teeth, there is a small conical, tooth-like process in both valves. The ligament is thin and delicate. Externally the shell is covered with a glossy, yellowish, or pale olive epidermis which reflects brilliant prismatic colors; the surface is marked by faint lines of growth and frequently also with fine concentric grooves or sulci, especially toward the ventral and anterior margins; in many specimens these are absent.

Length of one of the largest specimens, 7 mm.; height, 4.25 mm.; breadth, 3.2 mm.

Found in small numbers, at many stations, between N. lat. 43° 39′,

W. long. 69° 22′; and N. lat. 35° 12′ 10″, W. long. 74° 57′ 15″, in 22 to 516 fathoms, 1872–1885.

The most prominent character of this species is the relatively large size of the cartilage-pit which intersects both the hinge-margins and the beaks and is therefore plainly visible from the exterior. In outline it is similar to *Y. iris* and *Y. inflata* but is more pointed and narrower posteriorly than either of them. They differ also in having much smaller cartilage-pits and in the number of the teeth.

Specimens formerly identified as *Yoldia obesa* Stimpson, agree perfectly with authentic specimens of *lucida* sent by Doctor Friele from Spitzbergen. As none of the species known to us agree sufficiently well with the description and figure of *Leda obesa* Stimpson, for us to decide definitely as to its correct position, unless we are to consider the figure a very incorrect representation, we prefer to let it remain doubtfully, as a synonym of *Y. lucida*, where Jeffreys and others have placed it.

YOLDIELLA IRIS, new species.

(Plates LXXX, figs. 1, 2; LXXXII, fig. 11.)

Shell small, thin, rather delicate, long-ovate or ovate-elliptical, with the beaks in front of the middle, not much swollen; surface smooth, or nearly so, with brilliant iridescence. The antero-dorsal margin is convex and slightly arched, sloping gradually to the obtusely rounded and slightly produced anterior end; ventral margin very broadly and evenly curved; posterior end obliquely ascending, obtusely pointed or rounded at the tip with a slight dorsal angulation; postero-dorsal margin slightly convex, sloping but little, pinched up into a thin, rather prominent keel. The umbos are small and prominent with the beaks small, curved inward and backward, closely appressed to the margin. The epidermis is grayish or greenish yellow, smooth and shining; the surface is brilliantly iridescent, covered with faintly marked, fine, concentric lines, most distinct near the ventral margin and anteriorly; under the lens these appear like faint, close undulations over most of the surface. Escutcheon defined by a well-marked depression.

The hinge-margin is thickened and forms a very obtuse angle at the beaks; the posterior portion which is only slightly curved distally is longer than the anterior which is nearly straight. In the largest specimens there are twelve or thirteen acute erect V-shaped teeth in each series, including one or two minute, proximal ones. The resilial pit is minute, situated on the inner face of the thin edentulous hinge-plate, beneath the beaks, and faces ventrally so that it is scarcely visible in a front view and but partially interrupts the hinge-plate. Outside the series of teeth, on both sides of the beak there is a smooth, raised margin.

Length of one of the larger specimens, 7.5 mm.; height, 5 mm.; from beak to posterior end, 4.5 mm.

Found in considerable numbers, at about forty-five stations, between N. lat. 47° 40′, W. long. 47° 35′ 30″, and N. lat. 35° 12′ 10″, W. long. 74° 57′ 15″, in 20½ to 781 fathoms, 1872–1886.

This species is more elongated and more regularly elliptical than any of the allied species; the hinge-margin is also less angulated.

A single specimen (No. 74325), station 43, off Cape Sable, in 90 fathoms, 1877, at first thought to be a distinct species, differs from the typical form in being more oblong with the ventral margin less curved, the posterior end more evenly rounded with only a slight indication of a superior angulation, so that the shell has a pretty regular, narrow elliptical form. In all other respects, however, it agrees well with the ordinary form. This specimen, which receives the varietal name *stricta*, is figured on Plate LXXX, fig. 1.

Length, 5 mm.; height, 3 mm.; breadth, 1.3 mm.; length from beak to posterior end, 3 mm.

YOLDIELLA INFLATA Verrill and Bush.

(Plates LXXX, fig. 8; LXXXII, figs. 5, 6.)

Yoldia lucida VERRILL, Trans. Conn. Acad., VI, p. 279, 1884 (in part).
Yoldiella inflata VERRILL and BUSH, Amer. Journ. Sci., III, p. 56, figs. 3, 4, 11, January, 1897.

Shell small, swollen, rather short, subovate, with the posterior end broad, angulated postero-dorsally; beaks at about the anterior third; surface smooth. Antero-dorsal margin regularly convex and sloping rapidly to the anterior end which is evenly rounded, very obtuse, and passes insensibly into the evenly curved ventral margin which is decidedly convex, although the degree of convexity varies considerably in different specimens; the posterior end is obliquely subtruncated, with an obtuse curve below and an obtusely rounded angle at its upper extremity where it joins the nearly straight postero-dorsal margin. The umbos are full and well-rounded but not very prominent; the beaks are small, directly incurved, appressed to the margin. There is no distinct lunule but the margin is slightly pinched up in a small crest both before and behind the beaks. The ligament is delicate and shows slightly on both sides of the beak. Epidermis pale olive yellow or straw color; surface smooth, shining, reflecting prismatic colors, showing more or less distinct lines of growth which sometimes become regular, concentric, very fine striations, especially anteriorly. Hinge-margin well developed, moderately broad and considerably thickened, forming an obtuse angle at the beak where it is thin, encroached upon by the beak and interrupted by the cartilage-pit; the two portions are nearly equal in length, the anterior somewhat arched, the posterior nearly straight, each having a thin, smooth border above the teeth, about equal in breadth to the hinge-plate. In the largest specimens there are nine to eleven (most frequently ten) rather stout, angular teeth and about ten very similar posterior ones; the cartilage-pit is small and

just beneath the beak, forms a notch which completely interrupts the hinge-margin.

Length of one of the largest specimens, 6 mm.; height, 4.5 mm., thickness, 3 mm.; from beak to posterior angle, 4 mm.

Found in considerable numbers, at about twenty stations, between N. lat. 41° 53′, W. long. 65° 35′, and N. lat. 35° 9′ 50″, W. long. 74° 57′ 40″, in 516 to 1,608 fathoms, 1883–1886. Several live specimens, at station 2079, in 75 fathoms.

This species is closely related to *Y. lucida* (Lovén), from which it is easily separated by its shorter, broader, more swollen form, its strongly curved ventral margin, and very distinct postero-dorsal angle. It is shorter and has a broader posterior end than most of the related species. The resilium is not visible externally.

YOLDIELLA SUBANGULATA, new species.

(Plates LXXVII, fig. 3; LXXIX, fig. 6.)

Very similar to the preceding species in form but less pointed posteriorly and larger. The umbos are small, not prominent; beaks are small, directly incurved, appressed to the hinge-margin but not distinctly notched by the resilial pit. The antero-dorsal margin is convex, arched; the anterior end is a little produced, obtusely rounded; ventral margin evenly and broadly rounded, slightly produced posteriorly, forming an obscure obtuse angle as it merges into the posterior end which is obliquely subtruncated or a little inflexed in the middle, with a prominent dorsal angle; the postero-dorsal margin slopes but little, and is nearly straight, with the compressed edges forming a slight keel, which is a little convex in the middle. A well-marked ridge runs to the postero-dorsal angle, and a less distinct one to the postero-ventral angle; between these there is a slight depression of the surface. Surface nearly smooth, lustrous, reflecting prismatic colors, and covered with faint lines of growth and a few inconspicuous irregular sulci; epidermis pale olive yellow. The hinge-margin is narrow, very obtusely angled, and is interrupted under the beaks by the small notch-like resilial pit. The anterior series of teeth is slightly arched and contains about seventeen teeth, including three or four minute proximal ones; the larger ones are high and sharp. The posterior series is a little longer and contains about eighteen, similar, but somewhat more slender teeth. A thin, smooth margin extends along outside both series. There is a small internal denticle at the front edge of the resilial pit. Pallial sinus narrow, considerably inflexed.

Length, 8 mm.; height, 5 mm.; thickness, about 4 mm.; from beak to anterior end, 3 mm.; posterior end, 5 mm.

One live specimen was dredged by the *Bache* at station 46, N. lat. 43° 3′; W. long. 70° 4′, in 51 fathoms, 1874.

YOLDIELLA JEFFREYSI (Hidalgo).

(Plates LXXXI, fig. 5; LXXXIII, fig. 3.)

Leda lata JEFFREYS, Ann. Mag. Nat. Hist., p. 431, November, 1876.

Leda jeffreysi JEFFREYS, Proc. Zoöl. Soc. London, p. 579, pl. XLVI, fig. 2, June, 1879.—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XIII, p. 234, 1885.

Not *Yoldia jeffreysi* VERRILL, Trans. Conn. Acad., VI, p. 229, 1884.

Shell small, ovate-elliptical, somewhat thick for its size, rather swollen, covered with a glossy, iridescent, brownish yellow epidermis. The posterior end is considerably the longer, somewhat narrowed, bluntly rounded without any distinct rostrum. Umbos rather prominent, somewhat swollen; beaks prominent, curved inward and backward. The antero-dorsal margin is broadly convex, slopes a little and becomes continuous with the rather regularly curved outline of the rounded anterior end; ventral margin is broadly and regularly curved without any distinct flexure; the posterior end is obtusely rounded and not defined by any radial lines or ridges, with the dorsal margin nearly straight at first, usually slightly convex in the middle, and sloping gradually. The surface beneath the epidermis is nearly smooth but shows more or less distinct lines of growth, which sometimes have the form of fine parallel striations. The hinge-plate is thickened and rather strong; the two series of teeth are long and form a very obtuse angle at the beak; the anterior is somewhat the shorter and more oblique and a little curved. In our type specimen there are thirteen anterior teeth of which three or four proximal ones are very small; and fifteen posterior ones, including four or five small proximal ones; a somewhat larger specimen has fifteen in the anterior series and eighteen in the posterior. The two series are interrupted beneath the beak by a small, well-defined, concave, triangular resilial pit supported on the inner side by a distinct shelf-like projection.

Length of the type-specimen, 5 mm.; height, 3.1 mm. Length of the largest specimen, 5.6 mm.; height, 4.2 mm.

Six separate valves, at three stations, between N. lat. 37° 38′ 40″, W. long. 73° 16′ 30″, and N. lat. 36° 42′, W. long. 74° 30′, in 727 to 1,423 fathoms, 1884–1886.

As all of our specimens are much larger than the measurements given by Jeffreys, they are referred to *Y. jeffreysi* (Hidalgo) with some doubt, although they appear to agree well with Jeffreys's figure of that species in form and in the character of the hinge.

YOLDIELLA LENTICULA (Möller) variety AMBLIA, new.

(Plates LXXX, fig. 9; LXXXI, fig. 4.)

Nucula lenticula MÖLLER, Ind. Moll. Grœnl., p. 17, 1842.

Yoldia abyssicola TORELL, Spitzbergens Molluskfauna, p. 149, pl. I, figs. 4, *a–b*, 1859.

Portlandia lenticula G. O. SARS, Mollusca Reg. Arcticæ Norvegiæ, p. 39, pl. 4, figs. 10, *a–b*, 1878.

Leda lenticula JEFFREYS, Proc. Zoöl. Soc., London, p. 577, June, 1879.

Our specimens, which are worn and imperfect, referred to this northern species, differ somewhat from the typical specimens from Spitzbergen, received from Doctor Friele. They are relatively shorter, higher, and somewhat less swollen, with a thicker and heavier shell. The posterior end is less produced and less tapered, so that it has a more ovate form. The hinge-teeth are stouter; the posterior series is shorter but contains the same number of teeth in specimens of similar size. With the amount of material that we have for examination, the differences, however, seem hardly sufficient to warrant the separation of our shells as a distinct species. We therefore propose the varietal name *amblia* for our specimens.

A few separate valves, at two stations, north of Cape Cod, in 110 to 122 fathoms, 1878–79.

YOLDIELLA FRATERNA, new species.

(Plates LXXX, fig. 5; LXXXII, fig. 8.)

Yoldia frigida VERRILL, Trans. Conn. Acad., VI, p. 279, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 576, 1885 (in part).

Shell small, thin, delicate, irregularly elliptical in form, the posterior end being a little the longer, unusually broad, and slightly produced above, but not distinctly angulated, with a glossy, iridescent, yellowish green epidermis. Umbos a little swollen; the beaks small, scarcely prominent, and subcentral. The anterior end is broad, a little produced in the middle, and obtusely rounded; the dorsal margin is nearly horizontal in the region of the teeth; distally, sharp, and convex, then sloping rapidly to the middle of the anterior end. The ventral margin is broadly rounded, expanding a little posteriorly and then ascending pretty rapidly to the posterior tip which is obtusely rounded superiorly; postero-dorsal margin slightly convex and nearly horizontal for the greater part of its length. The surface beneath the epidermis is marked only by faint lines of growth. The hinge-margin is thin, rather delicate, with the two series of teeth of nearly equal length and diverging from the beaks at a broad angle; each series contains about ten rather thin and delicate teeth, of which the one or two proximal ones are very small and rather indistinct. Beneath the beak the margin is attenuated and interrupted by a small, oblong resilium which occupies the entire thickness of the margin and a slight notch in the beak. The pallial sinus is relatively rather large and deep, but in most specimens is invisible.

Length of the figured specimen, 4 mm.; height, about 2½ mm.

A comparatively small number of specimens, at about twenty stations, between N. lat. 47° 40′, W. long. 47° 35′ 30″, and N. lat. 37° 8′, W. long. 74° 33′, in 90 to 1,608 fathoms, 1873–1886.

This is a deep-water form formerly identified by us as *Yoldia frigida* Torell.

YOLDIELLA CURTA, new species.

(Plate XCVII, fig. 8.)

Phaseolus ovatus (?) VERRILL, Trans. Conn. Acad., VI, p. 230, 1884; Expl. *Albatross*. Report U. S. Com. Fish and Fisheries for 1883, p. 576, 1885 (not Seguenza).

Shell small, short-ovate, rather swollen in the middle, with rather prominent umbos, somewhat inequilateral, the posterior end the longer and slightly produced. Beaks small, incurved, with a slight posterior twist and a little separated from the margin. The dorsal margin is nearly straight medially, both before and behind the beaks, anteriorly it merges gradually into the broadly rounded anterior end, which usually has an obscure, blunt angulation in the middle; ventral margin broadly and evenly rounded, merging gradually into the more abrupt curve of the posterior end which is a little tapered, but obtusely rounded without any distinct rostrum or angulation; the postero-dorsal margin is a little prominent, pinched up and convex, with a considerable slope, so that the tip of the shell is but little above the middle. The surface is polished and somewhat iridescent, marked only by fine, irregular lines of growth. Epidermis pale greenish or brownish yellow. There is a relatively very large resilium, appearing yoke-shaped or wide W-shaped in the separated valves, and covering a relatively long, edentulous space beneath the beaks. The teeth are compressed, oblique, imperfectly V-shaped, especially posteriorly, and but slightly elevated. There are six or seven in the posterior series, of which the proximal ones are rather indistinct; and four distinct and two or three indistinct ones in the anterior series. In a dorsal view five are visible above the margin behind the beak and four before. They are not very long and rather blunt, with the distal side sloping and the side next the beak a little incurved and concave.

Length, 2.6 mm.; height, 1.8 mm.; thickness, about 1 mm.

A few live specimens, at three stations, between N. lat. 41° 11′ 30″, W. long. 66° 12′ 20″, and N. lat. 39° 38′, W. long. 70° 22′, in 499 to 1,290 fathoms, 1883–1886.

This species somewhat resembles *Y. frigida* in form, but it is relatively shorter, higher and less distinctly rostrated. Its hinge is also quite different. The present species is peculiar in having fewer and blunter teeth and a much larger resilium than most of the related species.

YOLDIELLA PACHIA, new species.

Shell very broad, oval, considerably swollen in the middle, with the length and height nearly equal; umbos rather prominent. The posterior end is narrowed and slightly produced, but not defined by any groove or carination. The dorsal margin is very obtusely angulated, anteriorly it is convex and slopes pretty rapidly to the broadly and evenly rounded anterior end; posteriorly it is nearly straight at first, then slopes gradually to the posterior end. The ventral margin is very

broadly rounded and slightly produced in the middle; it joins the curve of the posterior end with a scarcely perceptible incurvature in some specimens; the posterior end is obtusely rounded and situated about midheight of the shell. The dorsal edges of the valve are thin and a little pinched up, but there is no distinct lunule and only a very narrow ligamental furrow. The epidermis is polished and somewhat iridescent, and marked with fine, somewhat irregular lines of growth, in some places showing faint, microscopic, radial striations. Color of the dead valves, brownish yellow. Hinge-plate strong, narrow near the beak, wide distally, strongly angled, with the outer edge naked and rather broad, especially anteriorly. Teeth large and prominent distally, with about three small proximal ones; about eight in the anterior and ten in the posterior series. The resilial pit is a distinct, triangular fossette, or chondrophore, on the face of the margin, covering its whole breadth, and bordered internally by a thickened edge which causes an excurvature of the margin. There is a distinct marginal external ligament and furrow, or escutcheon.

Length, 4.6 mm.; height, 4.8 mm.

Three separate valves, among Foraminifera, at station 2385, N. lat. 28° 51′, W. long. 88° 18′, in 730 fathoms, 1885.

In outline this species resembles *Y. curta*, but differs in its wider and stouter hinge-plate, more numerous and more highly developed teeth, and especially in the form and structure of the resilial pit.

YOLDIELLA INCONSPICUA, new species.

(Plate LXXIX, figs. 3, 5.)

Shell small, thin, delicate, compressed, subovate; posterior end a little produced and narrowed medially. Surface lustrous and iridescent. Umbos scarcely prominent; beaks small, projecting but little above the dorsal margin. The antero-dorsal margin is slightly convex and nearly horizontal at first, then slopes gradually to the evenly rounded anterior end; ventral margin broadly rounded, slightly swollen posteriorly, ascending more rapidly to the narrow and bluntly rounded posterior end; postero-dorsal margin nearly straight toward the beak, then slightly convex and sloping very gradually. The surface is covered with fine, pretty regular, concentric grooves and raised lines, visible only under the microscope. Epidermis thin, shining, iridescent, greenish yellow. The hinge-margin is thin and delicate, nearly straight; the two series of teeth form a very obtuse angle at the beaks and are interrupted, for a considerable space, by the resilium which does not lie in a distinct pit. The ligament shows as a delicate, continuous marginal line, both in front of and behind the beaks. The teeth are small, oblique, V-shaped. In the anterior series there are about six distinct ones with one or two minute proximal ones; in the posterior, about seven distinct ones with one or two rudimentary ones near the beak.

The pallial sinus is rather wide and moderately deep, but is invisible in most specimens.

Length of the largest specimen, 3.6 mm.; height, 2.3 mm.

A number of specimens, at about fifteen stations, between N. lat. 42° 33′, W. long. 69° 58.5′, and N. lat. 35° 12′ 10″, W. long. 74° 57′ 15″, in 100 to 705 fathoms, 1878–1886.

This species is distinguished from *Yoldiella frigida*, and most of the other small species which it resembles, by its narrower, or lower, and more compressed form, more delicate shell, straighter dorsal margin, and the more central prolongation of the posterior end. It is apparently more nearly related to the smaller species, *Y. minuscula*, than to any other. The latter has a smaller, shorter, and more swollen shell, more convex ventrally, with the hinge-margin somewhat more angulated.

YOLDIELLA MINUSCULA, new species.

(Plate LXXIX, figs. 2, 7.)

Yoldia jeffreysi VERRILL, Trans. Conn. Acad., VI, pp. 229, 279, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 576, 1885.

Shell minute, broad-ovate, covered with microscopic, pretty regular concentric striations, with a very lustrous, somewhat iridescent, yellowish epidermis. The two ends are nearly equal in length; the posterior somewhat narrowed and obtuse at the end, the anterior well-rounded. The umbos are not prominent and the beaks are very small and project but slightly above the margin. The antero-dorsal margin is slightly convex at first, and nearly horizontal, and passes gradually into the curve of the anterior end; ventral margin is broad and nearly uniformly convex; the posterior end is a little produced in the middle and forms there a slight obtuse angle; the postero-dorsal margin is a little convex and nearly horizontal at first and then slopes rather rapidly to the tip. The hinge-margin is thin and delicate; the two series of teeth lie nearly in a straight line but the anterior one is a little oblique, so that they form a very wide angle at the beaks where the resilium entirely interrupts the hinge-margin forming a wide notch without any definite pit or shelf; the teeth are small, very oblique, and only slightly prominent; there are only about five in the anterior and six in the posterior series.

Length, about 2.3 mm.; height, about 1.5 mm.

Only a few specimens, at four stations, between N. lat 41° 53′, W. long. 65° 35′, and N. lat. 38° 27′, W. long. 73° 2′, in 705 to 1,290 fathoms, 1883–1885.

This very minute species may, with a larger series, prove to be the young of some of the preceding species.

YOLDIELLA SUBEQUILATERA (Jeffreys).

Leda subequilatera JEFFREYS, Proc. Zoöl. Soc., London, p. 579, pl. XLVI, fig. 3, 1879.

Yoldia subequilatera VERRILL, Trans. Conn. Acad., VI, pp. 229, 279, 1884 (in part); Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 576, 1885 (in part).

Leda subequilatera DALL, Bull. Mus. Comp. Zoöl., XII, p. 252, 1886.

Yoldia subequilatera DALL, Bull. U. S. Nat. Mus., No. 37, p. 44, 1889.

Several live specimens (No. 35204), from station 2037, N. lat. 38° 53′, W. long. 69° 23′ 30″, in 1,731 fathoms, 1883, have been referred to this species. Although younger or smaller than Jeffreys's type, they agree very closely with his figures and description. The shell is very small, very thin and transparent, polished, lustrous, but scarcely iridescent and marked only by microscopic lines of growth. It is rather compressed, nearly elliptical in form, with the beaks prominent above the dorsal margin and turned almost directly inward. Both ends are obtusely rounded and nearly equal in length, so that it is impossible to determine which is anterior and which is posterior by the external characters; one end, supposed to be the anterior, is however slightly broader than the other. There is no distinct ligament visible externally. The hinge plate is nearly straight, the two series of teeth forming but a slight angle. Interior not seen.

Our specimens measure from 1.5 to 2.5 mm. in length. South to Grenada, in 92 fathoms.—Dall.

YOLDIELLA EXPANSA (Jeffreys).

(Plate XCVII, fig. 3.)

Leda expansa JEFFREYS, Ann. Mag. Nat. Hist., p. 431, November, 1876; Proc. Zoöl. Soc., London, p. 580, pl. XLVI, fig. 4, June, 1879.

Not *Yoldia expansa* VERRILL, Trans. Conn. Acad., VI, p. 279, 1884.

Shell oblong-ovate, nearly equilateral, with the posterior end a little more broadly rounded than the anterior; both regularly obtuse. Both dorsal margins are slightly convex and slope but little. The hinge-plate is moderately wide, gently arched, with sharp dorsal margins, and is completely interrupted in the middle by a deep, angular notch for the resilium which is rather large and dark and is attached to the inner surface of the shell below the beak. In the right valve, there are nine posterior teeth, including one or two very small proximal ones, separated from the margin by a rather wide, smooth space; those in the middle of the series are long, with tapered, acute tips which are bent upward and toward the beaks, and at base are V-shaped. In the anterior series, which is a little the longer, there are ten teeth, including two or three very small, proximal ones; the larger ones are nearly erect with the tips less inclined than those in the posterior series; they are separated from the margin by a plain space about as wide as

the teeth. In the left valve, there are eleven anterior and nine posterior teeth. The surface of the shell is dull yellowish green, only slightly iridescent, and covered with irregular lines of growth which, in some places, form irregular raised lines. The umbos are but little prominent; the beaks are small and turn backward.

Length, 3.6 mm.; height, 2.5 mm.

One specimen (No. 78363), station 2697, N. lat. 47° 40′, W. long. 47° 35′ 30″, in 206 fathoms, 1886.

This species is peculiar in its nearly equilateral, elliptical form, with the dorsal margins gently convex and only slightly sloping both sides of the beaks, and especially in its large resilial notch which cuts entirely through the hinge-plate. It agrees pretty closely with Jeffreys' type, but the latter was much smaller and his figures and diagnosis are too imperfect to make its identity certain.

YOLDIELLA FRIGIDA (Torell).

(Plate LXXIX, fig. 4.)

Yoldia frigida VERRILL, Trans. Conn. Acad., V, p. 573, pl. XLIV, fig. 2, 1882; VI, p. 279, 1884 (in part); Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 576, 1885 (in part).

A very few specimens, at about ten stations, between N. lat. 43° 5′, W. long. 70° 11′ 30″, and N. lat. 39° 53′ 30″, W. long. 71° 13′ 30″, in 88 to 312 fathoms, 1874–1881.

YOLDIELLA DISSIMILIS, new species.

(Plates LXXVIII, fig. 8; LXXXII, fig. 7.)

Yoldia expansa VERRILL, Trans. Conn. Acad., VI, p. 279, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 576, 1885 (not of Jeffreys).

Shell small, oblong-ovate, nearly equilateral, with the anterior end the broader and bluntly rounded, the posterior end somewhat narrowed medially and bluntly rounded, without any distinct angulation. Umbos somewhat prominent; beaks small and strongly incurved. Surface straw-colored, not lustrous, covered with fine concentric lines. Antero-dorsal margin but little curved, sloping very gradually to the anterior end which is curved nearly in the arc of a circle; ventral margin very broadly rounded with a very slight obtuse angulation behind the middle; postero-dorsal margin slightly excavated just behind the beaks, then sloping very gradually to the obtuse posterior end. The hinge-margin is moderately stout; the two portions form a very wide angle at the beak with the anterior, which faces obliquely downward, considerably the more arched. In the center the margin becomes very thin and is interrupted by the resilium which occupies a deep notch and an internal shelf of considerable size, situated far back and directed downward to such an extent that it is only partially visible in a direct front view; there are about eleven or twelve anterior, and eight to ten poste-

rior acute, curved, V-shaped teeth; at the proximal end of the posterior series, in the left valve, there is an oblong, prominent, tooth-like process, much larger than the adjacent teeth. Three or four of the distal teeth, on each side, are decidedly large, prominent and acute with the tip curved outward, but the size decreases regularly toward the center. There is a well developed dark ligament, visible externally, both before and behind the beaks. The surface is covered by relatively rather large, distant, concentric ridges and furrows, easily visible under a lens, which are everywhere covered by very regular microscopic lines and grooves of about equal width.

Length of the largest valve, 4.25 mm.; height, 2.8 mm.

A few specimens, at four stations, between N. lat. 39° 49′, W. long. 68° 28′ 30″, and N. lat. 36° 47′, W. long. 73° 9′ 30″, in 1,451 to 1,685 fathoms, 1883–1886.

This species is remarkable for its oblong-ovate form and very regular concentric sculpture, consisting of fine ridges and furrows which are in turn everywhere covered with regular microscopic lines. This species was at first thought to be *Y. expansa* (Jeffreys) which it resembles in form, but additional specimens and more careful study show that the species are very distinct. In *Y. expansa* the hinge-margin is much straighter, the teeth fewer and different in form, the resilial pit very different, the two ends of the shell more nearly equal, and the sculpture quite different.

Our species differs considerably from the typical forms of *Yoldiella* in having a more oblong form with both ends evenly rounded, a well-developed ligament, and a more evident resilial fossette or chondrophore which, however, is situated decidedly below the hinge-plate. The existence of a peculiar tooth-like process adjacent to the resilial notch would be a character of considerable importance were it constant, but the specimens show great variation in its development; in some, it is even almost abortive. These distinctive characters, although important, seem hardly worthy of generic distinction.

Subfamily MALLETINÆ.

MALLETIA Desmoulins, 1832 (restricted).

Malletia VERRILL and BUSH, Amer. Journ. Sci., III, pp. 56, 63, January, 1897.

Type.—Malletia chilensis Desmoulins.

We have restricted this group to those species having a nearly smooth, somewhat compressed, oblong or elliptical shell, blunt posteriorly, without any definite rostrum or carination. The carinated and rostrated species that have been placed in it will thus be referred to *Neilo* H. and A. Adams. The resilium is wanting, or else represented by a special part of the ligament, external to the teeth. The ligament is well developed and prominent. The siphon tubes are long and united nearly to the tips.

The subgenus *Pseudomalletia*, proposed by Fischer for *M. obtusa*, was based on an erroneous description of the siphon tubes.

The following are some of the known species:

M. chilensis Desmoulins, Valparaiso (Type); *M. obtusa* (Sars) Mörch, from off Cape Fear, North Carolina, northward; *M. polita* Verrill and Bush, off Delaware Bay; *M. abyssorum* Verrill and Bush, off Chesapeake Bay; *M. cuneata* Jeffreys, North Atlantic; *M. pallida* Smith, Mid-South Atlantic; *M. arrouana* Smith and *M. dunkeri* Smith, Pacific; and *M. bellardii* Seguenza, fossil.

MALLETIA OBTUSA (M. Sars) Mörch.

(Plate XCVII, fig. 4.)

Yoldia obtusa G. O. SARS, Remarkable Forms of Animal Life, p. 23, pl. III, figs. 16–20, 1872.

Malletia obtusa G. O. SARS, Mollusca Reg. Arcticæ Norvegiæ, p. 41, pl. 19, figs. 3, *a–b*, 1878.—JEFFREYS, Proc. Zoöl. Soc., London, p. 586, June, 1879.—VERRILL, Trans. Conn. Acad., VI, pp. 226, 280, 1884; Expl. *Albatross*, Report U. S. Com. Fish and Fisheries for 1883, p. 576, 1885.—SMITH, E. A., Report Voy. *Challenger*, Zoöl. Lamellibranchiata, XIII, p. 245, 1885.—DALL, Bull. U. S. Nat. Mus., No. 37, p. 46, 1889.—BUSH, Bul. Mus. Comp. Zoöl., XXIII, p. 234, 1893.—LOCARD, Campagne du *Caudan*, Annales de l'Université de Lyon, p. 202, 1896.—VERRILL and BUSH, Amer. Journ. Sci., III, p. 57, fig. 9, 1897.

The soft parts of several specimens, rather poorly preserved in alcohol, have been examined. They have a large foot with an ovate disk pointed in front and minutely crenulated. The siphon tube is rather long and slender, in some cases not entirely retracted within the shell; it appears to contain both the branchial and anal tubes which are closely united quite to the simple tips; at the inner base, there is a well-marked siphonal septum. The gills are small, elongated, pointed posteriorly, and have the structure usual in the family. The palpi are rather large, elongated, with revolute margins; the palpal tentacle is very long and slender, and in the contracted state variously bent with the edge much convoluted. No pallial tentacle was found at the base of the siphon.

In our collection there is a large series of this species; the form is pretty constant and in nearly all cases is more oblong than the European species, as figured by G. O. Sars. The small specimens are compressed while the large ones are a little swollen. The umbos are small, but slightly elevated; the beaks are very small, turned directly inward, and are almost in contact with the margin, so that they are generally worn away in the larger specimens. Directly under, and partly in the beaks, and also cutting more or less into the thickness of the external side of the hinge-margin, there is a small notch, or shallow excavation, which is occupied by a special portion of the ligament that probably represents a remnant of a degenerated resilium. The true ligament is well developed and prominent for about one-half the length of the hinge-margin, then becomes abruptly thinner and nar-