

NOTES ON JAPANESE, INDOPACIFIC, AND AMERICAN  
PYRAMIDELLIDÆ.

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By WILLIAM HEALEY DALL,  
*Curator, Division of Mollusks,*

AND

PAUL BARTSCH,  
*Assistant Curator, Division of Mollusks.*

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While gathering material for the monograph of Pacific coast Pyramidellidæ on which the authors of the present paper have been for some time engaged, application for material for study was made to the Königliche Zoologische Museum in Berlin, where the types of many of the species treated of in the second edition of the Conchylien Cabinet were known to be preserved.

Through the kind intervention of the late Prof. Dr. Eduard von Martens, in charge of the conchological collection of the Berlin Museum, the entire series of their Pyramidellidæ, including numerous types, was lent to the U. S. National Museum for study. This series contained material from many sources, of which the most important were the collections of the late Henry and Arthur Adams, of Patel, of Dunker, and Hilgendorf. Numerous specimens of species inadequately described by Arthur Adams from Japan were among the most valuable for our work, and the importance of accurately figuring and adequately describing them was evident, as, until such descriptions were made public, no small number of species of the Japanese fauna must remain doubtful.

Though mostly small and to many students uninteresting, the Pyramidellidæ exist in much larger numbers than is generally realized. To obtain a satisfactory view of their specific characters, in most cases the species must be studied under the microscope, and to get accurate figures of these minute creatures enlarged photographs or camera lucida drawings are essential. The difficulty of obtaining these in the present instance was much enhanced by the death of our chief draftsman and faithful collaborator, the late Dr. J. C. McConnell, for

whom so far it has been impossible to find an equally qualified successor in line drawing. The figures in the present paper are chiefly enlarged photographs, retouched with careful reference to the specimen. With the exception of the microscopically fine striation, which could in most cases only be indicated on a much larger figure than those given here, it is believed that the figures are exceptionally accurate and complete.

The compilation of a card catalogue of the described species of Pyramidellidae has shown that the number is much greater than the compilers imagined before undertaking the work; and also that, apart from errors of identification, the specific names used for many of these species have often been repeatedly used, in some cases three or four times over, and of course it has become necessary to replace the pre-occupied name in each case by one not previously used in the genus. This will account for the number of new names for old species which occur in the present paper.

The senior author desires to say that his part in this paper has been of an advisory and editorial nature, and that the labor of comparisons, of preparing the diagnoses and comments, and practically the entire text, except the introduction, has been borne by the junior author, to whom the appreciation due on this account should be fully accorded.

The types, except where otherwise stated, have been returned to the Berlin Museum, where they may be consulted by students.

#### DESCRIPTIONS OF THE SPECIES.

##### PYRAMIDELLA (LONGCHAEUS) BICOLOR Menke.

*Pyramidella bicolor* MENKE, Malak. Blätt., I, 1854, p. 28.

Two specimens from the Pætel collection labeled *Obeliscus aelis* A. Adams, Japan, are absolutely identical with specimens of *P. bicolor* Menke, in our collection from Guacomayo, Mexico, and we firmly believe that the locality cited by Pætel is wrong.

##### PYRAMIDELLA (PHARCIDELLA) HASTATA A. Adams.

*Obeliscus hastatus* A. ADAMS, in Sowerby Thes., 1854, p. 811, No. 24.

Two shells labeled *Pyramidella pulchella* Dunker, new species (a manuscript name), are in the Dunker collection. There is no locality label with them. The shells are in every way identical with specimens in our collection of *P. hastatus* Adams, from Acapulco, Mexico.

## PYRAMIDELLA (PHARCIDELLA) MOFFATI, new name.

*Obeliscus clavulus* A. ADAMS, in Sowerby Thes., 1854, p. 811, pl. CLXXI, fig. 33, not *Obeliscus clavulus* (Férussac) BECK, Index Moll., 1838, p. 62.

The Patel collection contains a specimen of this species labeled *Obeliscus achates* Gould, see *crocatus*, Japan. In the aperture of this shell a specimen of *Anachis diminuta* C. B. Adams was firmly wedged, which is at home on the west coast of Central America and Mexico. The *Pyramidella* therefore very likely belongs to the same region. The type of *O. clavulus* A. Adams came from Acapulco, Mexico.

## PYRAMIDELLA (TRIPTYCHUS) NIVEUS Mörch.

*Triptychus niveus* MÖRCH, Mal. Blätt., XXII, 1875, p. 158.

Four specimens in the Patel collection, labeled *Parthenia calata* A. Adams, Japan, belong to this species. It is quite likely that the locality cited is wrong, and that the specimens came from the West Indies, the home of *P. (T.) niveus*.

## PYRAMIDELLA (TIBERIA) PULCHELLA A. Adams.

Plate XXV, fig. 4.

*Obeliscus pulchellus* A. ADAMS, in Sowerby Thes. Conch., 1854, p. 808, pl. CLXXI.

Shell very regular elongate-conic, yellowish-white, marked by two moderately broad, equal spiral zones of brown, one at the periphery, the other on the anterior portion of the base. Nuclear whorls two and one-half, moderately large, smooth, about one-third immersed in the first of the post-nuclear whorls, having their axis at right angles to the axis of these. Post-nuclear whorls polished, flattened, slightly shouldered at the summit, marked only by faint lines of growth; posterior half between the sutures pale yellow, anterior half white, bounded at the periphery by the spiral chestnut band which can be seen at the suture of all the whorls. Periphery of the last whorl slightly angular. Base short, rounded, marked by many lines of growth which are much stronger here than between the sutures: the basal color-band is separated from the columella by a narrow white zone. Aperture subovate, somewhat channeled at the junction of the outer lip and the columella, outer lip thin, apparently not fortified within by varices or spiral lamellæ; columella straight, rather strong, reflected, biplicate, the posterior fold large, lamellar, a little below the insertion of the columella, the anterior one much more oblique and but feebly developed, parietal wall covered by a very thin callus.

The Berlin collection contains four specimens, all from Japan; one, belonging to the Patel collection is described and figured. It has lost

the earlier whorls, the eleven remaining measure: long, 12.2 mm.; diam. 4.6 mm. The other three come from H. Adams.

Another specimen, the nucleus of which is described, is No. 181207 U.S.N.M. This also comes from Japan. It has twelve post-nuclear whorls and measures: long, 11.3 mm.; diam. 4.3 mm.

PYRAMIDELLA (TIBERIA) JAPONICA, new species.

Plate XXIV, fig. 2.

Shell umbilicate, regularly elongate-conic, polished, bluish-white, with a diaphanous spiral band on the middle of the whorls between the sutures. Nuclear whorls two, moderately large, smooth, having their axis at a right angle to the axis of the later whorls, and about one-third immersed in the first of these. Post-nuclear whorls flattened, slightly shouldered at the summit, marked only by extremely fine lines of growth. Periphery of the last whorl angular; base rather short, well rounded, marked by rather coarse lines of growth. Aperture moderately large, suboval (outer lip fractured), showing indications of internal lirations; columella very strong, somewhat oblique, biplicate, the posterior fold lamellar, situated a little below the insertion of the columella; anterior fold weak and very oblique.

The type and only specimen is immature; it has eight post-nuclear whorls and measures: long, 6.1 mm.; diam. 2.8 mm.

The specimen is from the Patel collection and comes from Japan; it was labeled *Syrnola vitrea* A. Adams.

PYRAMIDELLA (TIBERIA) PUSILLA A. Adams.

Plate XXIV, fig. 6.

*Obeliscus pusillus* A. ADAMS, in Sby. Thes. Conch., 1854, p. 809, pl. CLXXI, fig. 7.

Shell, small, minutely umbilicate, moderately stout, elongate-conic, milk-white. Nuclear whorls small, two and one-half obliquely immersed in the first of the succeeding whorls. Post-nuclear whorls slightly rounded, decidedly shouldered at the summits and somewhat angulate at the periphery, polished, marked only by lines of growth and extremely minute microscopical spiral striations. The slight peripheral angulations show above the summit of the succeeding whorl and help to render the sutures all the more conspicuous. Base of the last whorl rather long, well rounded. Aperture suboval, posterior angle acute, outer lip thin, columella slightly oblique and revolute, showing only a single fold at the edge. In specimens which have the outer lip fractured, the second, i. e., anterior fold comes plainly into view as well as five internal lirations of the outer lip.

The specimen described and figured is from Japan. It has eight post-nuclear whorls and measures: long, 6.4 mm.; diam. 2.6 mm. This is

a small, shining, milk-white species, which might easily be mistaken for a *Syrnola*, on account of the deep-seated anterior fold. Some of the specimens show faint irregular impressed axial lines, which we consider accidental. A. Adams described a species, *Obeliscus burneus*,<sup>a</sup> which, according to the meager description, appears to differ from *P. (T.) pusilla* only in having the whorls here and there longitudinally sulcate. If these sulcations are the same as the irregular impressed axial lines seen in specimens of *P. (T.) pusilla*, then *P. (T.) burneus* will have to be placed in the synonymy of *P. (T.) pusilla*. The Berlin material contains two shells, both from Japan, one of which was obtained from H. Adams, the other belongs to the Patel collection.

**PYRAMIDELLA (TIBERIA) PUSILLA JACKSONENSIS, new subspecies.**

Plate XXVI, fig. 8.

There are two specimens of *Tiberia* in the Patel collection from Port Jackson, Australia, which agree in general with *P. (T.) pusilla* A. Adams, but are uniformly stouter. We therefore separate them subspecifically under the above name. The type, figured, has eight postnuclear whorls and measures: long. 6.1 mm.; diam. 2.7 mm.

**PYRAMIDELLA (TIBERIA) TRIFASCIATA A. Adams.**

Plate XXV, fig. 6.

*Obeliscus trifasciatus* A. ADAMS, Proc. Zool. Soc., 1862, p. 232.

Shell elongate-conic, acuminate, minutely perforate, vitreous, with three rather broad spiral yellow bands, two of which appear between the sutures and the third on the middle of the base. Nuclear whorls two, small, well rounded, smooth, a little more than half obliquely immersed in the first of the succeeding whorls. Postnuclear whorls slightly rounded, moderately shouldered at the summits, polished, marked only by fine lines of growth and microscopic spiral striations, encircled between the sutures by two yellow bands, each of which is about one-quarter the width of the space between the sutures. The whorls are thus marked by a vitreous zone at the summit, then a yellow one, which is followed by another vitreous band, and finally the second yellow zone, which extends to the suture. Periphery of the last whorl well rounded; base rather long, marked with lines of growth and spiral striations as on the spire; the yellow band on the middle of the base is of the same width as the other two. Aperture rather small, suboval, posterior angle acute, outer lip thin, fortified deeply within by five subequal and subequally spaced interrupted spiral lamellæ; columella straight, strong, reflected, armed with two folds, a strong lamellar plait a little anterior to its insertion and a much weaker and

<sup>a</sup> Proc. Zool. Soc., 1862, pp. 232-233.

much more oblique posterior one; parietal wall apparently without callus.

The specimen described and figured is from the Patel collection and comes from Japan. It was wrongly labeled *Agatha nitidula* A. Adams. The specimen has eight postnuclear whorls and measures: long. 6 mm.; diam. 2.7 mm.

**PYRAMIDELLA (TIBERIA) DUNKERI, new name.**

Plate XXV, fig. 2.

*Ostomia fasciata* DUNKER, Mal. Blätt., VI, 1860, p. 234; also Moll. Japonica, 1861, p. 17, pl. II, fig. 2; not (*Ostomia*) *Chrysallida fasciata* CARPENTER, Cat. Maz. Shells, 1856, p. 423.

Shell elongate-conic, acuminate, perforate, subdiaphanous, marked by two moderately broad golden yellow bands, one encircling the whorls a little posterior to the periphery; the other, which is about double the width of the first, is situated a little anterior to the middle of the base. In addition to these two bands a narrow white zone surrounds the whorls a little posterior to the middle between the sutures. Nuclear whorls two and one-half, small, half embedded in the first of the later whorls, having their axis at a right angle to the axis of these. Postnuclear whorls moderately rounded, decidedly shouldered at the summit, almost tabulated, marked by many faint lines of growth and closely placed microscopic spiral striations, which are equally well developed between the sutures and on the base. Periphery and base of the last whorl well rounded. Aperture small, suboval; posterior angle obtuse, outer lip thin, no internal lirations visible (these may prove to be present when a specimen is ground down); columella slender, reflected biplicate; posterior fold lamellar, situated a little anterior to the insertion of the columella, anterior fold very oblique, weak; parietal wall covered by a mere film of callus.

The type is from Ousima, Japan. It has eight postnuclear whorls and measures—long. 5 mm.; diam. 2.3 mm.

**PYRAMIDELLA (COSSMANNICA) ACICULATA A. Adams.**

Plate XXIV, figs. 1, 8.

*Obeliscus aciculatus* A. ADAMS, in Sowerby Thes. Conch., 1854, p. 809, pl. CLXXI, figs. 21, 36.

Shell elongate-conic, tapering to an extremely slender apex, polished, white, with a slight suffusion of brown at the apex and near the aperture. Nuclear whorls two, large compared with the early postnuclear whorls, helicoid, depressed, smooth, having their axis almost at a right angle to the axis of the later whorls and extending beyond the outline of these on the left side. The first three postnuclear whorls are well

rounded, the next five considerably flattened, the rest decidedly obese. The first five are vitreous, but as the shell grows older it gradually becomes milk-white; summits of the whorls closely appressed to the preceding whorl, the appressed portion appearing as a narrow band, which at first sight appears as the suture; this, however, is very inconspicuous. All the postnuclear whorls are marked by fine lines of growth and fine, closely-placed, wavy spiral striations. Periphery and base of the last whorl well rounded, marked by lines of growth and spiral striations as between the sutures. The area immediately adjoining the columella is decidedly depressed, forming a pit, but the axis is not perforate. Aperture auriform, moderately large, oblique; posterior angle acute, slightly channeled at the junction of the outer lip and columella; columella rather strong, very oblique, revolute showing only the lamellar posterior fold when the lip is complete. This fold is situated a little anterior to the insertion of the columella. Parietal wall covered by a decided callus. Specimens having the outer lip fractured show the well-developed, very oblique anterior fold, also seven spiral striations all of which but the anterior one, which is stronger, are subequal and subequally spaced.

This species enjoys a wide distribution. The Pætel collection contains one specimen from Hawaii, which we figure and which was labeled *Pyramidella variegata* A. Adams, but is certainly not that species. The U. S. National Museum has six shells, No. 76720, from Wallis Island, one of which is here described, and three lots from the Viti Islands: No. 42219, seven specimens; No. 87933, five specimens, and No. 101414, three specimens, all of which are remarkably uniform in appearance. One specimen having the nucleus and fifteen postnuclear whorls measures—long, 17.3 mm.; diam. 4.4 mm.

PYRAMIDELLA (ACTÆOPYRAMIS) EXIMIA Lischke.

Plate XXIII, fig. 1.

*Monopygma eximium* LISCHKE, Mal. Blätt., XIX, 1872, p. 103; also Jap. Meer. Conch., Pt. 3, 1874, p. 59, pl. III, figs. 4-6.

Shell elongate-conic, solid, polished, early whorls white, later ones light chestnut-brown, encircled by subequal spiral zones. Nuclear whorls small, smooth, almost wholly immersed in the first post-nuclear whorl. First four post-nuclear whorls snowy white, the second half of the fifth one tinged with brown, remainder of the whorls brown. All of the whorls are moderately rounded, somewhat shouldered at the summit, sculptured by faint lines of growth and deeply incised, moderately broad spiral lines, of which there are six on the second, seven on the fourth, and on the remaining whorls between the sutures; on the penultimate the posterior incised line becomes obsolete and the flattened raised band therefore doubly as wide. These spiral

lines are crossed by very fine, equally spaced axial bars, which lend them a punctate appearance. The space between the incised lines is about four times as wide as the lines, and flattened. Periphery and base of the last whorl well rounded, sculptured like the space between the sutures; incised lines eleven. Aperture large, pyriform, posterior angle acute; outer lip sharp, wavy, showing the incised lines within; columella moderately strong, somewhat curved, and slightly revolute; fold not visible in the aperture; parietal wall covered by a faint callus.

The single specimen described above is in the Dunker collection. It has nine post-nuclear whorls which measure: long. 18.1 mm.; diam. 6.8 mm. This is very likely one of the specimens from the type collection which came from Japan.

PYRAMIDELLA (ACTÆOPYRAMIS) FULVA A. Adams.

Plate XXIII, fig. 4.

*Monopygma fulva* A. ADAMS, Proc. Zool. Soc., 1851, p. 222.

Shell elongate-conic, greyish-black. Nuclear whorls decollated. Post-nuclear whorls well rounded, very high between the sutures, scarcely shouldered at the summit, marked by lines of growth, and moderately broad, deeply incised, minutely axially barred spiral lines, of which six occur upon the second to sixth whorl and seven upon the seventh to eighth, between the sutures. The spaces between these lines are flattened and minutely spirally striated. Periphery of the last whorl well rounded. Base somewhat prolonged, sculptured like the space between the sutures, having ten of the deeply incised spiral lines. Aperture large, narrow, suboval, posterior angle acute, columella short, moderately strong, twisted and slightly revolute, with a weak oblique fold near its insertion; parietal wall covered by a thin internal callus.

The specimen described belongs to the Patel collection and comes from Japan. It has nine post-nuclear whorls which measure: long. 20.3 mm.; diam. 5.8 mm.

*P. (A.) fulva* differs from *P. (A.) eximia* by its more slender form, much higher whorls between the sutures, much less shouldered summits, much more prolonged base, narrower and more elongate aperture, the additional fine spiral striations on the raised portion between the deeply incised spiral lines, and by its color.



## PYRAMIDELLA (ACTÆOPYRAMIS) CASTA A. Adams.

Plate XIX, fig. 4.

*Monopygma casta* A. ADAMS, Proc. Zool. Soc., 1851, p. 223; also in Sowerby Thes., 1854, p. 818, pl. CLXXII, fig. 22.

Shell elongate-conic, moderately stout, yellowish-white. Nuclear whorls small, almost completely immersed in the first post-nuclear whorl; the periphery of the last volution only is visible, and this appears at right angles to the axis of the later whorls. Post-nuclear whorls moderately rounded, marked by mere lines of growth and many broad, deeply incised spiral channels, which are almost equal in breadth to the raised spaces bounded by them. These channels are crossed by numerous small axial riblets, which render the edges of the spiral raised bands somewhat crenulate. The spiral raised bands are faintly spirally striated. Ten of these incised channels appear between the sutures on the third and fourth, and eleven on the sixth and the penultimate whorl. The posterior channel is usually a little wider than the rest. Periphery and base of the last whorl well rounded, the latter sculptured like the spaces between the sutures, having twelve incised channels. Aperture suboval, posterior angle acute, outer lip wavy, rather strong and opaque; columella slender, curved and twisted with an oblique, obsolete fold near its insertion, parietal wall without marked callus.

There are two specimens among the Berlin material, both belonging to the Patel collection and both from Japan. The largest, the one described above, has eight post-nuclear whorls and measures: long. 11.3 mm.; diam. 4.1 mm. The other has seven and one-half post-nuclear whorls and measures: long. 10.5 mm.; diam. 3.9 mm.

This species in general outline recalls *P. (A.) fulva*, but is much smaller, has many more incised spiral channels, and is white in color.

## PYRAMIDELLA (ACTÆOPYRAMIS) LAUTA A. Adams.

Plate XIX, fig. 5.

*Monopygma lauta* A. ADAMS, Proc. Zool. Soc., 1851, p. 222; also in Sowerby Thes., 1854, p. 817, pl. CLXXII, fig. 20.

Shell broadly elongate-conic, subturritid, rather stout, milk-white. Nuclear whorls small, almost completely immersed in the first post-nuclear whorl, only the tilted edge of two volutions is apparent, which indicates that the axis of nuclear whorls is at right angles to the axis of the later ones. Post-nuclear whorls inflated, strongly shouldered at the summit, decidedly rounded, marked by many weak, irregular axial riblets and very strong, broad, angular, incised, spiral channels, which are crossed by many more or less regularly spaced and subequally developed backward slanting axial riblets. These riblets

render the flattened and faintly spirally striated, raised spaces between the incised channels feebly crenulated on both edges. Five incised channels appear between the sutures on the second and third whorl and six on the fourth and fifth. Periphery and base of the last whorl well rounded, the latter sculptured like the space between the sutures, with six spiral channels. Aperture quite large, suboval, posterior angle obtuse, outer lip thin, denticulate. The incised spiral channels appear as a chain of squarish areolations within, by transmitted light; columella moderately strong, somewhat twisted and slightly reflected with a subobsolete oblique fold near its insertion; parietal wall covered by a very feeble callus.

The specimen described belongs to the Pætel collection. It is from Japan and has six and three-fourths post-nuclear whorls and measures: long, 7 mm.; diam. 3.3 mm.

PYRAMIDELLA (ACTÆOPYRAMIS) AMCENA A. Adams.

Plate XIX, fig. 1.

*Monopygma amena* A. ADAMS, Proc. Zool. Soc., 1851, p. 223.

Shell slender, elongate-conic, turrated, milk white. Nuclear whorls small, almost completely immersed in the first of the later whorls, the peripheral portion of the last volution only is visible, which shows that the axis of the nucleus is at right angles to the axis of the later whorls. Post-nuclear whorls very high between the sutures, decidedly shouldered, moderately well rounded, marked by rather coarse lines of growth and deeply incised spiral channels, which are crossed by many regular, quite well-developed, axial riblets. These little riblets divide the channels into regular chains of pits. There are five channels between the sutures on the second and third whorl and six on the following three. The raised portion between the channels is of about double the width of the channel, somewhat crenulated on both margins and faintly spirally striated. Periphery and base of last whorl well rounded, sculptured like the space between the sutures, with nine spiral channels, the raised spaces between them gradually diminishing in breadth toward the umbilical region, which is somewhat excavated. Aperture subquadrate, posterior angle acute, junction of columella and outer lip subchanneled; outer lip somewhat expanded at the outer edge, wavy in outline, rather thick, the incised channels appearing as mere lines within by transmitted light; columella straight, thin, fold not visible in the aperture; parietal wall without callus.

Two specimens are among the Berlin material, both in the Pætel collection and from Japan. The larger one, described above, has seven post-nuclear whorls, and measures: long, 7 mm.; diam. 2.6 mm. The smaller one, labeled *pupoides* A. Adams, has six post-nuclear whorls, and measures: long, 5.4 mm.; diam. 2.3 mm.

This species recalls *P. (A.) lauta*, but is much more slender.

## PYRAMIDELLA (ACTÆOPYRAMIS) PUNCTIGERA A. Adams.

Plate XIX, fig. 2.

*Monoplygma punctigera* A. ADAMS, Ann. Mag. Nat. Hist., VII, 1861, p. 296.

Shell slender, elongate-conic, milk white. Nuclear whorls two, moderately large, depressed helicoid, obliquely one-half immersed in the first of the later whorls. Post-nuclear whorls very high between the sutures, moderately rounded and shouldered at the summits, marked by rather coarse lines of growth and deeply impressed, equally spaced spiral channels, which are crossed by small, quite regular and regularly spaced riblets. The space between these riblets appears as a pit and the whole groove as a pitted channel. Six channels are present between the sutures on the second to fourth and seven on the last two whorls. Periphery and base well rounded, the latter sculptured like the space between the sutures, crossed by eight spiral channels. Aperture moderately large, subquadrate, posterior angle acute, (outer lip fractured), columella moderately strong, twisted, columellar fold not visible in the aperture, parietal wall covered by faint callus.

The specimen above described belongs to the Pætel collection. It has six post-nuclear whorls, and measures: long. 5.4 mm.; diam. 1.8 mm.

The present species in some respects resembles *P. (A.) amana* Adams, but is much smaller, much more attenuated, with proportionately much higher whorls.

## PYRAMIDELLA (ACTÆOPYRAMIS) DIGITALIS, new species.

Plate XIX, fig. 6.

The Pætel collection contains a young individual labeled "*Monoplygma digitalis* A. Adams," from Japan. We have been unable to find any reference to such a species, and are also unable to make it harmonize with any of the described forms. While we dislike to base a description upon a young individual, we nevertheless feel that the present report would be incomplete without it.

Nuclear whorls small, completely immersed, only the rounded periphery of the last is visible above the first of the succeeding volutions. Post-nuclear whorls three, inflated, well-rounded, shouldered, the second encircled by five and one-half strong, narrow, subequal, and subequally spaced spiral keels between the sutures, separated by spaces about one and one-half times as wide as the keels. These spaces are crossed at regular intervals by backward-slanting axial riblets which are about two-thirds as wide as the spiral keels but not quite as elevated. The axial ribs and spiral keels inclose quite regular, depressed, rhombic areas. There are six spiral keels on the third whorl. Periphery and base well rounded, the latter somewhat produced and excavated near the small umbilical chink, ornamented like the spaces between

the sutures, having eight spiral keels. Aperture oval, somewhat effuse at the junction of the columella and outer lip, posterior angle obtuse; outer lip strong, rather thick, showing as many low, rounded lirations within as there are spaces between the keels on the outside; columella strong, armed with a well-developed oblique fold a little anterior to its insertion; parietal wall covered by a thin callus.

The specimen measures: long. 2.2 mm.; diam. 1.3 mm.

PYRAMIDELLA (SYRNOLA) CINNAMOMEA A. Adams.

Plate XXVI, fig. 1.

*Elusa cinnamomea* A. ADAMS, Proc. Zool. Soc., 1862, p. 237.

Shell slender, elongate-conic, of almost rectilinear outline, polished, yellowish-brown. Nuclear whorls two and one-half, rather large, helicoid, moderately elevated, smooth, having their axis at a right angle to the axis of the later whorls and about one-fourth immersed in the first of them; the periphery of the nucleus extends slightly beyond the outline of the spire on the left side. Post-nuclear whorls quite high between the sutures, flattened, separated by slight sutures marked only by faint lines of growth and numerous extremely fine and closely placed spiral striations. Periphery and base of the last whorl well rounded, the latter rather short. Aperture small, suboval, posterior angle narrow and acute, outer lip thin, columella short, curved, moderately strong, with an inconspicuous oblique fold near its insertion; parietal wall covered by a thin callus.

The specimen described and figured belongs to the Patel collection and comes from Japan. It has eight post-nuclear whorls, and measures: long. 4.2 mm.; diam. 1.1 mm.

This shell has the aspect of a small, straight *Eulima*.

PYRAMIDELLA (SYRNOLA) BRUNNEA A. Adams.

Plate XXIV, figs. 4, 7.

*Oboliscus brunneus* A. ADAMS, in Sowerby Thes., 1854, p. 810, pl. CLXXI, fig. 35.  
*Oboliscus bureus* GOULD, Proc. Bost. Soc. Nat. Hist., VII, 1861, p. 403.

Shell elongate-conic, light brown, shining. Nuclear whorls two and one-half, small, depressed helicoid, polished, having their axis at a right angle to the axis of the latter whorls and about one-sixth immersed in the first of them. Post-nuclear whorls flattened, slightly shouldered, rather low between the sutures, marked only by lines of growth and microscopic spiral striae. Sutures subchanneled and minutely crenulated. Periphery and base of last whorl well rounded, marked like the spaces between the sutures. Aperture suboval, posterior angle acute; outer lip thin; columella short, somewhat twisted and revolute, bearing a strong oblique fold a little anterior to its insertion; parietal wall covered by a thin callus.

A. Adams's type came from Japan. The above description is based upon two individuals from a lot of four, U. S. National Museum collection, No. 170808, which come from Hirado, Hizen, Japan. The nucleus was described from one specimen and the post-nuclear characters from the most perfect individual in the collection, which belongs to the same lot; this has sixteen post-nuclear whorls, and measures: long. 17, 6 mm.; diam. 4.5 mm. This specimen is a little more slender than the average individual. One, having fourteen post-nuclear whorls, measures: long. 14.2 mm.; diam. 4.3 mm. Some show five well-developed, subequal and subequally spaced interrupted lirations on the outer lip. The fine spiral striations are quite superficial and do not appear on specimens which are somewhat worn. There are two other specimens, No. 130076, in the U. S. National Museum from Japan. Gould's type of *Obeliscus buxeus* is from the China Seas; it is an immature shell of ten post-nuclear whorls and is registered as No. 339. A specimen received from Eastlake, No. 160634, was collected at Hongkong, China. The Berlin collection contains one worn and bleached individual which is lacking a number of the early post-nuclear whorls. It was labeled *Obeliscus bicolor* Menke, California, which of course is an error. *O. bicolor* is a triplicate species = *Pyramidella (Longchaeus) bicolor* Menke.

PYRAMIDELLA (IPHIANA) LISCHKEI, new species.

Plate XXV, fig. 1.

Shell slender, elongate-conic, subdiaphanous, polished, girdled by two golden-yellow bands between the sutures. Nuclear whorls decolated. Post-nuclear whorls rather high between the sutures, very slightly shouldered and well rounded, marked by rather strong lines of growth and scarcely visible closely placed spiral striations. The posterior band lies somewhat posterior to the middle of the whorl, while the anterior one is somewhat posterior to the periphery, showing therefore, on all the whorls a little above the well-marked suture. Periphery of the last whorl well rounded. Base attenuated. Aperture suboval, posterior angle acute, outer lip slightly expanded anteriorly, without internal lirations, columella reenforced by the attenuated base, and almost enveloped by it, bearing a moderately strong, oblique fold near its insertion; parietal wall covered by a thin callus.

The specimen described above belongs to the Patel collection and comes from Japan. It has eight post-nuclear whorls, and measures: long. 4.6 mm.; diam. 1.4 mm.

## PYRAMIDELLA (IPHIANA) TENUISCUPTA Lischke.

Plate XXVI, figs. 3, 5.

*Oboliscus tenuisculptus* LISCHKE, Mal. Blätt., 1872, XIX, p. 102; also Jap. Meer. Conch., III, 1874, pp. 58-59, pl. III, figs. 7-8.

Shell, elongate-conic, sides of the spire rectilinear in outline, pale wax-yellow. Nuclear whorls decollated. Post-nuclear whorls flattened, increasing very regularly in size, slightly shouldered at the summit, separated by well-marked sutures, and marked by faint lines of growth and numerous fine, closely spaced spiral striations. Periphery of the last whorl somewhat angulated. Base very short, well rounded and slightly excavated at the umbilical region, sculptured like the space between sutures. Aperture subquadrate, posterior angle acute, outer lip thin, without internal lirations, columella short, somewhat twisted, revolute, bearing a moderately strong oblique fold a little anterior to its insertion.

The specimen described belongs to the Paetel collection, and is from Japan. It has eleven post-nuclear whorls (the apex and perhaps the first two or three post-nuclear whorls being lost), and measures: long. 10.4 mm.; diam. 2.9 mm. It was labeled *Oboliscus balteatus* A. Adams.

## PYRAMIDELLA (STYLOPTYGMA) SEROTINA A. Adams.

Plate XVII, fig. 5.

*Syrnola serotina*, A. ADAMS, Proc. Zool. Soc., 1862, p. 234.

Shell very small, elongate-conic, wax-yellow, darker toward the apex. Nuclear whorls one and one-half, rather large, loosely coiled, white, obliquely immersed in the first post-nuclear whorl, i. e., the first post-nuclear whorl encircles the nucleus and is thereby rendered quite large and stands out beyond the general outline of the shell. Post-nuclear whorls polished, moderately rounded, marked by faint lines of growth and here and there by an impressed axial line. Spiral sculpture absent. The first four whorls are marked by a rather broad, conspicuous reddish-brown band which encircles them at about one-third of the distance between the sutures anterior to the summit; on the fifth and sixth whorls this band appears as a faint line. The periphery of the last whorl is also encircled by a pale reddish-yellow spiral zone, part of which can be seen projecting above the well-impressed sutures on the preceding two volutions. Periphery and base of the last whorl well rounded, the latter rather short, marked like the space between the sutures. Aperture subquadrate, posterior angle acute (outer lip fractured), showing several internal lirations; columella stout with a strong oblique fold somewhat anterior to its insertion; parietal wall covered by a thin callus.

The specimen here described belongs to the Paetel collection. It has seven post-nuclear whorls, and measures: long 3 mm.; diam. 1.1 mm.

## PYRAMIDELLA (AGATHA) VIRGO A. Adams.

Plate XVIII, fig. 2.

*Agatha virgo* A. ADAMS, Ann. Mag. Nat. Hist., VI, 1860, p. 422,*Myonia virgo* A. ADAMS, Ann. Mag. Nat. Hist., VII, 1861, p. 295,*Menestho virgo* A. ADAMS, Ann. Mag. Nat. Hist., VII, 1861, p. 295,*Myonia virgo* A. ADAMS, Ann. Mag. Nat. Hist., VIII, 1861, p. 142,*Amathis virgo* A. ADAMS, Ann. Mag. Nat. Hist., VIII, 1861, p. 304.

Shell elongate-conic, subturritid, milk-white. Nuclear whorls two, small, well rounded, obliquely about one-half immersed in the first post-nuclear whorl. Post-nuclear whorls rather high between the sutures, inflated, well rounded, shouldered, marked by irregular lines of growth which lend the surface a somewhat uneven appearance and many fine, closely-placed wavy spiral striations; sutures strongly marked. Periphery of the last whorl with a faint suggestion of an angulation. Base prolonged, gently rounded, marked like the spaces between the sutures. Aperture elongate-ovate, posterior angle obtuse, somewhat effuse at the junction of the lip and columella; outer lip thin without internal lirations; columella short, curved, with a very strong, acute, oblique fold near its insertion which fuses directly and is continuous with the anterior reflected portion of the columella; parietal wall covered by a very thin callus.

The specimen described was received from Hilgendorf and comes from Japan. It has ten post-nuclear whorls and measures: long. 13.7 mm.; diam. 4.4 mm. There are two other individuals among the Berlin material, both young specimens and both from Japan. *P. (A.) virgo* A. Adams is the type of *Agatha*; we do not know why Adams changed this to *Myonia* and *Amathis* as we have been unable to find the name preoccupied.

## TURBONILLA (CHEMNITZIA) MULTIGYRATA Dunker.

Plate XX, fig. 4.

*Turbonilla multigyrate* DUNKER, Ind. Moll. Mar. Jap., 1882, II, pl. XIII, figs. 18-20.

Shell large, elongate-conic, milk-white. Nuclear whorls three, large, helicoid, moderately elevated, having their axis at a right angle to the axis of the later whorls and scarcely at all immersed in the first of them. Post-nuclear whorls well rounded, the greatest convexity falling a little anterior to the middle between sutures, moderately shouldered, and ornamented by strong, rounded, oblique, flexuose axial ribs, which are somewhat fused at the summit and more so at the periphery. Intercostal spaces rounded, not quite as wide as the ribs, decidedly depressed, terminating suddenly at the periphery. Fourteen axial ribs are present upon the first, eighteen upon the fifth, twenty upon the tenth, and twenty-four upon the penultimate whorl. Suture channeled, periphery somewhat angulate, the summits of succeeding whorls

fall a little anterior to the peripheral termination of the depressed intercostal spaces and leave a very narrow smooth band apparent in the suture. Base of the last whorl very short, slightly rounded, with a small depressed area at the columella. Aperture subquadrate, moderately large, posterior angle obtuse, outer lip thin, showing the external sculpture within by transmitted light; columella short, straight, and slightly revolute, with a weak, deep seated, oblique fold near its insertion, which is not apparent in the aperture when this is viewed squarely.

The type comes from Japan, has fifteen post-nuclear whorls and measures: long. 11.5 mm.; diam. 2.8 mm.

**TURBONILLA (CHEMNITZIA) DUNKERI** Clessin.

Plate XX, fig. 3.

*Turbonilla dunkeri* CLESSIN, Mart. Chem. Conch. Cab., 2d ed., Pyram., 1900, p. 257, pl. xli, fig. 3.

Shell elongate-conic, gently tapering, dirty white. Nuclear whorls three, small, decidedly elevated, very loosely coiled, having their axis at a right angle to the axis of the later whorls and scarcely at all immersed in the first of them. Post-nuclear whorls very slightly rounded, almost flattened in the middle between the sutures, rather high, marked by strong, rounded, oblique axial ribs which extend prominently from the summit of the whorls to the periphery. Intercostal spaces about as wide as the ribs, decidedly depressed, extending from the summit to the periphery, where they suddenly terminate. Twelve axial ribs are present on the first, sixteen on the fifth, and twenty-one on the penultimate whorl. These ribs are not at all fused at the summit of the whorls, but remain distinct. At the periphery, however, they do become fused and terminate the depressed interspaces. Sutures subchanneled. Periphery of the last whorl slightly angulated. Base moderately long and gently rounded. Aperture small, subquadrate, posterior angle obtuse, outer lip thin, columella slender, slightly curved and somewhat revolute, having a weak, very oblique, deep-seated fold near its insertion, which is not visible in the aperture when this is viewed squarely.

There are three specimens in the Dunker collection. Clessin's types: they are from Nagasaki, Japan. The largest one of these, the one above described, has eleven post-nuclear whorls and measures: long. 6.2 mm.; diam. 1.6 mm. The smallest one agreeing in every way with the larger specimen, has nine post-nuclear whorls and measures: long. 4.2 mm.; diam. 1.2 mm.

Clessin's figure of this species is so poor that it not only fails in delineating the characters of the species, but is absolutely misleading.



## TURBONILLA (CHEMNITZIA) ABSEIDA, new species.

Plate XXI, fig. 4.

Shell large, elongate-conic, milk-white, shining. Nuclear whorls decollated. Post-nuclear whorls decidedly rounded, slightly shouldered and somewhat constricted at the periphery, marked by very strong lamellar oblique axial ribs and deeply impressed intercostal spaces which are about twice as wide as the ribs. The ribs do not fuse at the summit but terminate strongly as cusps, rendering the outline of the summits wavy; they fuse at the periphery and there suddenly terminate the deep intercostal spaces. The type, which has lost the nucleus and perhaps the first three post-nuclear whorls, has fourteen ribs on the first (remaining), sixteen on the fifth, and twenty-two on the penultimate whorl. The summits of succeeding whorls on the later volutions drop a little anterior to the periphery and permit a narrow plain band to appear above the suture. Periphery of the last whorl slightly angulated. Base short, well rounded. Aperture moderately large, subquadrate, posterior angle obtuse; outer lip thin, showing the external sculpture within by transmitted light; columella oblique, revolute, with a weak oblique fold at its insertion.

The type and five additional specimens belong to the Dunker collection and come from Japan. One of these has been donated to the U. S. National Museum, where it is entered as No. 185886. The ten remaining post-nuclear whorls in the type measure: long. 8.4 mm.; diam. 2.3 mm. Another specimen lacking only the nucleus has twelve post-nuclear whorls and measures: long. 8 mm.; diam. 2.3 mm. It is possible that this form may be *Turbonilla perfecta* A. Adams, but this can only be decided when Adams' types shall have been located. His scant descriptions and lack of measurements make positive identification impossible when dealing with *Chemnitzia*, *Turbonilla*, or *Odosomia*.

## TURBONILLA (CHEMNITZIA) APPROXIMATA, new species.

Plate XX, fig. 1.

Shell elongate-conic, gently tapering, white. Nuclear whorls decollated. Post-nuclear whorls flattened, slightly shouldered, ornamented by strong, rather narrow, oblique, axial ribs which are distinct at the summit but fuse at the periphery. Twelve of these ribs appear on the first, fifteen upon the fifth, eighteen upon the tenth, and twenty-two upon the penultimate whorl. Intercostal spaces a little wider than the ribs, decidedly depressed, terminating suddenly at the periphery. The summit of the succeeding whorls falls a little anterior to the termination of the intercostal spaces and leaves a very narrow smooth area above the well-marked sutures. Periphery of the last whorl very

slightly angulated, base moderately long and well rounded. Aperture moderately large, subquadrate, posterior angle acute, outer lip thin, showing the external sculpture within by transmitted light; columella slender, oblique, somewhat revolute; columellar fold not apparent in the aperture, parietal wall covered by a thin film of callus.

There are two specimens in the Berlin collection, both belong to the Dunker collection and come from Japan; one of these has been donated to the U. S. National Museum and is entered as No. 185887, the other, the type, has thirteen post-nuclear whorls, and measures: long. 8.2 mm.; diam. 2.1 mm.

**TUBONILLA (CHEMNITZIA) INFANTULA, new species.**

Plate XX, fig. 2.

Shell very small, slender, milk-white. Nucleus prominent, helicoid, with elevated spire, consisting of two and one-half whorls, which are about one-fourth immersed in the first of the later whorls and have their axis at a right angle to the axis of these. Post-nuclear whorls six, moderately rounded and ornamented by strong, oblique ribs, of which sixteen occur upon the first and eighteen upon the penultimate whorl. Intercostal spaces about as wide as the ribs, terminating abruptly at the periphery. Base smooth. Aperture moderately large; outer lip (fractured). This is a young specimen; we add it to make the report complete. It was collected by Hilgendorf in Japan and measures: long. 2.1 mm.; diam. .6 mm.

**TURBONILLA (CHEMNITZIA) ACTOPORA, new species.**

Plate XX, fig. 6.

Shell very slender, elongate-conic, white. Nuclear whorls small, helicoid, obliquely one-third immersed in the first of the later whorls. Post-nuclear whorls rather high between the sutures, flattened and somewhat shouldered at the summit, marked by rather poorly developed, low, broad, rounded, obliquely slanting axial ribs of which fourteen appear upon the second, sixteen upon the fifth and tenth whorl. On the penultimate these ribs are subobsolete. Intercostal spaces shallow, narrow, terminating at the periphery. Periphery and base of the last whorl well rounded, smooth. Aperture moderately large, subquadrate, posterior angle obtuse, outer lip thin, showing the external sculpture within by transmitted light; columella oblique, straight, somewhat revolute, bearing a low, rounded fold a little anterior to its insertion; parietal wall covered by a mere film of callus.

The Dunker collection contained five specimens of this species, one of which has been donated to the U. S. National Museum, No. 185888, all from Japan. The type has twelve post-nuclear whorls and measures: long. 6.8 mm.; diam. 1.5 mm.

The slender shape and poorly developed sculpture which becomes subobsolete on the last whorl will differentiate this from the other described species.

**TURBONILLA (CHEMNITZIA) ACOSMIA**, new species.

Plate XX, fig. 5.

Shell rather stout, broadly elongate-conic, gently tapering, milk-white. Nuclear whorls one and three-fourths, planorboid, large, extending somewhat beyond the outline of the spire on the left side, scarcely at all immersed, having their axis at a right angle to the axis of the later whorls. Post-nuclear whorls rather high between the sutures, slightly rounded, somewhat shouldered, ornamented by rather low, broad, rounded, oblique axial ribs (which are badly worn on the first two whorls), the third contains fourteen, the fifth twenty, and the penultimate thirty; these ribs are distinct at the summit, but fuse at the periphery of the whorls. Intercostal spaces narrow, scarcely depressed below the general surface of the shell, extending to the periphery. Sutures well marked. The summits of the last three whorls fall a very little anterior to the termination of the intercostal spaces and leave a very narrow plain band above the suture. Periphery and base of the last whorl well rounded. Aperture subquadrate, somewhat produced and effuse at the junction of the columella and the outer lip; posterior angle acute, outer lip thin, showing the external sculpture within by transmitted light; columella straight, oblique, somewhat revolute, with a very weak, low, oblique fold a little anterior to its insertion.

The type belongs to the Dunker collection and is without definite locality. All the other Pyramidellids in the Dunker collection are from Japan. It is quite probable therefore that this may also be the home of the present species. The type and only specimen has ten post-nuclear whorls and measures: long. 8.4 mm.; diam. 2.4 mm.

*T. acosmia* is similar in outline and ribbing to *Turbonilla (Strioturbonilla) securo* = (new name for *Turbonilla obeliscus* Gould,<sup>a</sup> not *Chemnitzia obeliscus* C. B. Adams,<sup>b</sup> = *Turbonilla (Strioturbonilla) obeliscus* C. B. Adams) from Simons Bay, Cape Town, South Africa, but lacks the fine spiral striæ and is in every way somewhat smaller.

**TURBONILLA (CHEMNITZIA) GARRETTIANA**, new name.

Plate XXI, fig. 5.

*Odostomia sulcata* GARRETT, Proc. Acad. Nat. Sci. Philadelphia, 1873, p. 224, pl. III, fig. 46. Not *Turbonilla sulcata* DE FOLIN, 1871.

Shell moderately large, subdiaphanous, bluish white, shining. Early whorls decollated. Later whorls almost flattened, somewhat shouldered

<sup>a</sup>Proc. Bost. Soc. Nat. Hist., VII, 1861, p. 406. <sup>b</sup>Contr. to Conch., 1850, pp. 72-73.

at the summits, ornamented with poorly developed, broad, low, almost vertical axial ribs which are strongest at the summit of the whorls and gradually grow weaker toward the periphery. The first three post-nuclear whorls probably are lost. The second of those left has eighteen ribs; the antipenultimate twenty-four and the penultimate twenty-two; on this they are much weaker than on the preceding whorls. Intercostal spaces broad and shallow, scarcely sunk below the general surface of the shell, becoming obsolete toward the periphery like the ribs. Sutures well marked. Base of the last whorl rather prolonged, smooth. Aperture moderately large, suboval, posterior angle acute; outer lip thin, junction of the columella and outer lip well rounded; columella oblique, somewhat revolute, provided with a prominent fold, a little anterior to its insertion; parietal wall covered by a thin callus. The sixteen remaining whorls measure: long. 7.3 mm.; diam. 2.1 mm.

The type is No. 58111 of the collection of the Philadelphia Academy of Natural Sciences and was collected by Garrett, in the Viti Islands.

**TURBONILLA (CHEMNITZIA) CRENULATA** Menke.

Plate XXI, fig. 6.

*Orytoma crenulata* MENKE, Synopsis Methodica Molluscorum, 1830, p. 137.

Shell elongate-conic, subturritid, milk-white. Nuclear whorls decollated. Post-nuclear whorls flattened, somewhat shouldered at the summit, crossed by strong, rounded, very oblique, slightly sinuous, axial ribs, of which sixteen occur upon the fourth, twenty upon the tenth, and twenty-four upon the penultimate whorl. These ribs show a tendency toward fusing at the summit of the whorl, where they become slightly thickened; they extend strongly to the well-impressed sutures. Intercostal spaces about one-half as wide as the ribs, moderately depressed, terminating suddenly at the somewhat angulated periphery of the last whorl. Base of the last whorl short, well rounded, moderately large, marked only by lines of growth. Aperture subquadrate, somewhat effuse at the junction of the lip and columella, posterior angle acute, outer lip thin, showing the external sculpture within by transmitted light, columella straight, almost vertical, somewhat revolute, provided with a very weak oblique fold at its insertion; parietal wall covered by a thin callus.

There are two specimens in the Patel collection which we believe to be the types. They are labeled "Mexico." They agree in every respect, except in the number of whorls. We have figured and described the larger one of the two, which has thirteen post-nuclear whorls and measures: long. 8.6 mm; diam. 2 mm.

Menke<sup>a</sup> states that the specimens were collected by Doctor Schiede. Upon search it was ascertained that Doctor Schiede collected on the

<sup>a</sup>Synopsis Methodica Molluscorum, 1830, p. 137.

Atlantic side, especially about Vera Cruz. It is, therefore, quite likely that this may be the home of the present species.

*Oxytremia* was proposed by Rafinesque for a genus of *Melamians*.

NISITURRIS, new subgenus.

Plate XXIV, fig. 3.

This subgenus is proposed for *Turbonilla* (N.) *crystallina*, which is differentiated from all the *Turbonillas* which we have seen by its very peculiar nucleus. The nucleus in *Turbonilla* is helicoid or planorboid; in this individual, however, it is pupoid—that is, the nuclear whorls resemble a small sinistral pupa placed obliquely on the later whorls. The post-nuclear characters are those of *Chemnitzia* s. s.

TURBONILLA (NISITURRIS) CRYSTALLINA, new species.

Plate XVII, fig. 7. Plate XXIV, fig. 3.

*Chemnitzia crystallina* DUNKER, Cat. Mus. Godeffroy, IV, 1869, p. 78 (a nomen nudum), not *Pyramis crystallina* BROWN, 1827 (= *Odostomia*) nor *Odostomia crystallina* GARRETT, 1873 (= *Pyramidella* (*Iphiana*) *crystallina*), nor *Odostomia* (*Auriculina*) *crystallina* Monterosato, see Carus. Prod. Fauna Medit., p. 275, 1893; = *O. diaphana* Jeffreys.

Shell very slender and thin, elongate-conic, slightly umbilicated, almost transparent. Nuclear whorls large, very much elevated, coiled to resemble a small sinistral Pupa, smooth, situated obliquely upon the spire of the post-nuclear whorls and extending considerably beyond the lateral outline of this. Post-nuclear whorls rather high between the sutures, somewhat overhanging (this is particularly true of the earlier volutions), slightly shouldered at the summit, ornamented by strong, oblique, rounded axial ribs, which are slightly cusped at their posterior extremity, where they show a tendency toward becoming fused; fused at the periphery; twenty-two of these ribs occur upon the first (this whorl is more rounded than the rest and closer ribbed), fourteen upon the second, twelve upon the fifth, sixteen upon the tenth, and twenty upon the penultimate whorl. The intercostal spaces are twice as wide as the ribs, decidedly depressed, smooth, terminating at the fusing point of the ribs on the periphery. The summits of succeeding whorls fall somewhat anterior to the periphery of the preceding whorl and give the whorls an overhanging effect as well as a narrow smooth band between the anterior termination of the intercostal spaces and the subchanneled sutures. Periphery and base of the last whorl well rounded, the latter very short, marked only by faint lines of growth. Aperture very large, almost circular in outline, outer lip thin, transparent, showing the external sculpture within; columella thin, curved and revolute, with a slight oblique fold near its insertion; parietal wall covered by a mere film of callus.

The type belongs to the Dunker collection and comes from Upolu, one of the Samoan Islands. It has twelve post-nuclear whorls and measures: long. 4.5 mm.; diam. 1 mm. The nuclear whorls measure about 1 mm. long. This species is the type of the subgenus *Visiturris*, which differs from *Chemnitzia* s. s. by having the peculiar nucleus of the present species.

**TURBONILLA (STRIOTURBONILLA) MONOCYCLA** A. Adams.

Plate XXII, fig. 8.

*Turbonilla monocycla* A. ADAMS, Ann. Mag. Nat. Hist., VI, 1860, p. 418; not *Parthenia* (= *Olostomia* (*Egila?*)) *monocycla* A. ADAMS.

Shell elongate-conic, slender, slightly umbilicated, milk-white. Nuclear whorls small, almost completely obliquely immersed in the first post-nuclear whorl. Post-nuclear whorls very finely, wavyly, spirally striated, shouldered at the summit, flattened, with a well impressed sulcus at the periphery; marked by strong, decidedly sinuous axial ribs, of which sixteen occur upon the second, nineteen upon the fifth, and thirty upon the penultimate whorl. These ribs pass over the moderately deep peripheral sulcus and render the intersections with its edges subnodulose. The entire sulcus to the anterior edge is visible above the suture; this therefore appears very deep. Intercostal spaces not quite as wide as the ribs. Base well rounded, sculptured by the continuation of the axial ribs, which extend to the umbilicus, and the minute spiral striation. Aperture rather large, suboval, posterior angle obtuse; outer lip thin, showing the external sculpture within by transmitted light; columella slender, curved, and revolute, provided with a quite strong oblique fold at its insertion.

The specimen described belongs to the Patel collection, and comes from Japan. It has eight post-nuclear whorls, and measures: long. 4.3 mm.; diam. 1.5 mm. Another lot from the same collection and locality contains two additional specimens, both immature.

**TURBONILLA (PYRGISCULUS) CANDIDISSIMA**, new name.

Plate XVII, fig. 3.

= *Dunkeria candida* A. ADAMS, Ann. Mag. Nat. Hist., VIII, 1861, p. 301; not *Chemnitzia candida* A. ADAMS, Proc. Zool. Soc., 1853; nor *Turbonilla candida* DE FOLIX, Fonds de la Mer, I, 1871.

Shell, milk-white, elongate-conic, with strongly, slopingly shouldered whorls. Nuclear whorls small, obliquely almost completely immersed. Post-nuclear whorls inflated, summits strongly, slopingly shouldered, ornamented by strong, decidedly elevated subacute, axial ribs, of which about twelve occur upon the first, eighteen upon the fifth, and twenty-two upon the penultimate whorl. These ribs extend prominently over the shoulder to the summit. Intercostal spaces about double the width of the axial ribs, crossed by alternate raised

and depressed spiral bands between the sutures, the raised bands are usually a little wider than the depressions, are spirally striated, and show here and there a tendency to bifurcation. Nine depressed areas are present upon the second, eleven upon the fifth, and the penult whorl, the posterior two of which are situated upon the shoulder and are less strongly developed than the rest. Periphery and base of the last whorl well rounded, the latter somewhat produced, and sculptured like the spaces between the sutures, by the axial ribs, which extend quite prominently to the umbilicus and ten spiral raised and depressed bands. Aperture large, oval, outer lip thin, showing five deep-seated, interrupted, spiral lirations, the posterior ones of which are stronger and more distantly spaced; columella slender, revolute, curved, provided with a quite prominent fold near the insertion; parietal wall covered by a quite strong callus.

The specimen described belongs to the Dunker collection and comes from Nagasaki, Japan. It has eight post-nuclear whorls, and measures: long. 6.7 mm.; diam. 2.2 mm. There are two other specimens with this, one of which served for the description of the nucleus, which is lost in the type. Two other lots, both from Nagasaki, Japan, contain two and three specimens, respectively.

In some individuals the ribs are somewhat thickened at the anterior end of the shoulder and give this part a crenulated appearance; the width of the raised, spiral areas is also narrower in some individuals than the depressed areas.

TURBONILLA (PYRGISCUS) MUMIA A. Adams.

Plate XVII, fig. 1.

*Chrysalida mumia* A. ADAMS, Ann. Mag. Nat. Hist., VII, 1861, p. 45; not *Chemnitzia mumia* STOPANI, 1858, which is not a Pyramidellid.

Shell elongate-conic, small, white. Nuclear whorls three, moderately large, helicoid, having their axis at a right angle to the axis of the later whorls and about one-third immersed in the first of them. Post-nuclear whorls slightly rounded, almost flattened, shouldered at the summit with strong rounded axial ribs which render the summits of the whorls subcrenulate. There are fourteen of these ribs on the first, twenty on the fifth, and twenty-two on the penultimate whorl. Inter-costal spaces about as wide as the ribs, crossed by a slender equal and equally spaced raised spiral threads, of which there are eight on the fourth and ten on the penultimate whorl between the sutures. Periphery of the last whorl somewhat angulated. Base attenuated, sculptured like the spaces between the sutures, by the axial ribs and ten spiral threads. Aperture rather small, outer lip (fractured) showing the external markings within, columella somewhat oblique, straight, revolute, with a fold near its insertion which would scarcely be visible in a specimen with a perfect aperture.

The specimen described and figured belongs to the Patel collection, and comes from Japan. It has eight post-nuclear whorls, and measures: long. 3.3 mm.; diam. 1. mm.

**TURBONILLA (CINGULINA) CINGULATA** Dunker.

Plate XXI, fig. 1.

*Turbonilla cingulata* DUNKER, Mal. Blätt., VI, 1860, p. 239; also Moll. Jap., p. 16, 1861, pl. VIII, fig. 13; not *Monoplygma* or *Oscilla cingulata* A. ADAMS.

Shell elongate-conic, slender, milk-white. Nuclear whorls three, large, helicoid, rather elevated, smooth, having their axis at a right angle to the axis of the later whorls, and about one-fourth immersed in the first of them. Post-nuclear whorls ornamented between the sutures by three strong, moderately rounded, raised spiral keels, which are separated by channels of about the same width; the first keel is at the summit of the whorl; these raised keels are marked axially by irregular lines of growth while the depressed channels are crossed by numerous more or less equally developed and equally spaced slender axial bands. A trace of the first keel anterior to the periphery may be seen above the suture in several of the last whorls. The periphery of the last whorl is marked by the anterior edge of the third channel, the next keel anterior to this is like those between the sutures, the remainder of the short base is marked by five less strongly developed keels and channels, the space about the umbilical region having faint, wavy spiral striations. Aperture moderately large, suboval, posterior angle obtuse, slightly effuse at the junction of the outer lip and columella; outer lip arcuate, columella short, slender, curved, with a small and very oblique fold near its insertion which scarcely shows in the aperture; parietal wall covered by a thin callus.

The above description was made from Dunker's type specimen, the nucleus was described from a specimen belonging to the type lot which comes from Nagasaki, Japan. The type has twelve post-nuclear whorls (is minus the nucleus), and measures: long. 7.4 mm.; diam. 2.1 mm.

The type lot contains four specimens. Another lot from Hilgendorf comes from Enosima, Japan, and one belonging to the Patel collection is labeled simply Japan.

Dunker states that the last whorl has eight lirations. He appears to have overlooked the basal one, which is not sharply defined in the somewhat worn type.

**TURBONILLA (CINGULINA) CINGULATA LATICINGULA**, new sub-species.

Plate XXI, fig. 3.

Shell similar to *T. (C.) cingulata*, a little more slender, with the nuclear whorls about one-third buried; the small axial bars are a little more pronounced and only four basal keels are present, the first one



anterior to the periphery being extremely wide, fully double the width of the next. The aperture also is a little more effuse at the junction of the outer lip and the columella.

The type has nine post-nuclear whorls, and measures: long. 4 mm.; diam. 1.2 mm. It belongs to the Pætel collection, and comes from Japan.

**TURBONILLA (MORMULA) PHILIPPIANA** Dunker.

Plate XVIII, fig. 5.

*Turbonilla philippiana* DUNKER, Mal. Blätt., VI, 1860, p. 239; also Moll. Jap., 1861, p. 16, pl. 1, fig. 12.

Shell broadly conic, vitreous to milk-white. Nucleus decollated. Post-nuclear whorls well rounded, moderately shouldered, crossed by about twenty strong, rounded axial ribs; intercostal spaces rounded, a little wider than the ribs, crossed by nine subequal and subequally spaced, moderately broad incised spiral lines which extend up on the sides of the axial ribs. At irregular intervals several axial ribs are fused and enlarged to form a varix. Periphery and base of last whorl well rounded, the latter marked by the faint continuations of the axial ribs, which scarcely extend to its middle, and twelve well incised, wavy, spiral lines which become wider and more distantly spaced toward the umbilical region. Aperture rather small, subquadrate; posterior angle obtuse; columella short, somewhat straight, twisted; columellar fold not visible in the aperture; parietal wall covered by a thin callus.

Two specimens are before us; Dunker's type, from Desima, Japan, a poor and much-worn individual and another in the U. S. National Museum, received from A. Adams, collected in Japan and labeled *Mormula rissoina* A. Adams. These two specimens appear both to be young shells and are absolutely identical. We have therefore described and figured the more perfect of the two, which we do not believe to be *M. rissoina* A. Adams. Both have seven and one-half post-nuclear whorls which in the U. S. National Museum specimen No. 126062 measure: long. 5.3 mm.; diam. 2.6 mm. Dunker's specimen (type) measures: long. 5.5 mm.; diam. 2.6 mm.

**TURBONILLA (MORMULA) AULICA**, new name.

Plate XXII, fig. 7.

*Turbonilla varicosa* DUNKER, Mal. Blätt., VI, 1860, p. 339; also Moll. Jap., 1861, p. 15, pl. 11, fig. 9; =? *Chemnitzia varicosa* A. ADAMS, 1853, not *Parthenia (Mormula) varicosa* FORBES, Report Aeg. Inv., 1844, p. 136, nor *Turbonilla varicosa* DODERLEIN, 1892.

Shell elongate-conic, gently and evenly tapering; flesh-color with a brown base. Nuclear whorls decollated. Post-nuclear whorls well rounded, somewhat shouldered, crossed by strong rounded axial ribs,

about sixteen of which appear on the fourth, eighteen on the eighth, and twenty-two on the penultimate whorl. At irregular intervals several of these ribs are fused and enlarged to form a varix, five of which are present on this shell. Intercostal spaces about as wide as the ribs, marked by seven moderately broad, incised, spiral lines between the sutures; the posterior one of these is at some little distance below the summit. These lines are subequally spaced and of about the same width, except the last one, which is about twice as broad as the others and marks the periphery with a series of rectangular pits. The elevated spaces between the incised lines pass over the axial ribs and render them faintly nodulose. The spaces inclosed between the first and second, fourth and fifth, and sixth and seventh spiral lines are a little more elevated than the rest and hence appear as stronger nodes on the ribs. Periphery of the last whorl angulated. Base short, moderately rounded, marked by the feeble continuation of the axial ribs, which hardly extend to the umbilical region, and eight well-incised subequally spaced, wavy, spiral lines, the raised area between the anterior one of these and the series of pits at the suture is like the raised spaces between the incised lines between the sutures; the rest appear as mere wavy raised threads. Aperture subquadrate, posterior angle obtuse, outer lip showing the external sculpture within; columella straight, twisted, without apparent fold, parietal wall covered by a thin callus. Columella brown; this color tinges the adjacent area, fading out altogether on the middle of the base.

Dunker's type, the specimen here described and figured, comes from Desima, Japan. It has fourteen postnuclear whorls and measures: long. 9.6 mm.; diam. 2.2 mm.

**TURBONILLA (LANCELLA) BELLA, new species.**

Plate XXII, fig. 6.

Shell elongate-conic, slender, vitreous to milk-white. Nuclear whorls three, large, helicoid, considerably elevated, smooth, having their axis almost at a right angle to the axis of the later whorls. Post-nuclear whorls quite high between the sutures, well rounded, with a mere indication of a shoulder at the summit, ornamented by moderately strong, rounded axial ribs, about eighteen of which occur upon the second, twenty on the fifth, and twenty-eight upon the penultimate whorl. Intercostal spaces about two-thirds the width of the ribs. The spiral sculpture between the sutures consists of equal and subequally spaced alternate raised and depressed areas, both of which pass over the axial ribs and lend them a subnodulose aspect; eight of these areas appear on the third, nine upon the fifth, and eleven upon the penultimate whorl. In addition to the above-described sculpture, seven irregularly distributed varices are present, which consist of several enlarged and fused axial ribs. The first one of these appears on the

first post-nuclear whorl. Periphery of the last whorl angular. Base very short, almost flat, marked by faint continuations of the axial ribs and twelve wavy, spiral lirations which are separated by channels of about the same width; both lirations and channels are widest at the periphery and gradually become smaller toward the umbilical area. Aperture rather small, subquadrate, posterior angle obtuse, outer lip thin, showing the external sculpture within; columella straight, slender, and somewhat revolute; columellar fold not apparent in the aperture; parietal wall covered by a mere film of callus.

The type has nine and one-eighth post-nuclear whorls and measures: long. 7.5 mm.; diam. 2.3 mm. It belongs to the Patel collection and comes from Japan. It was labeled *Mormula elongata* H. Adams, which was evidently intended for *Turbonilla (Lancea) elongata* Pease, as A. Adams has not described a *T. elongata*. The present species strongly recalls *T. (Lancea) peasei*, but differs from it in nuclear structure, in the number of alternating raised and depressed spiral area and in the structure of the base which in *peasei* is sculptured like the space between the sutures.

**TURBONILLA (LANCELLA) PEASEI, new name.**

= *Turbonilla (Lancea) elongata* PEASE, Am. Jour. Conch., III, 1868, p. 293, pl. XXIV, fig. 22. Not *Turbonilla elongata* KÖNIGCK, 1841; nor *Chemnitzia elongata* PHILIPPI, 1844; nor *Chemnitzia humboldtiana elongata* REQUIEN 1848. *Turbonilla (Lancea) peasei* is the type of the subgenus *Lancea*.

**BABELLA, new subgenus.**

Shell with strong axial ribs between the sutures and three spiral keels, two of which are at the periphery, which falls in the deep sulcus between them, and one a little anterior to the middle of the base.

*Type*.—*Turbonilla (Babella) cælatior*, new name.

**TURBONILLA (BABELLA) CÆLATIOR, new name.**

Plate XVII, fig. 9.

*Parthenia cæolata* A. ADAMS, Jour. Linn. Soc. London, VII, 1863, p. 4; not *Turbonilla cæolata* GOULD, Proc. Bost. Soc. Nat. Hist., VII, 1861, p. 406; nor *Chemnitzia cæolata* CARPENTER, Ann. Mag. Nat. Hist., XV, 1865, p. 400, which may be called *hypocurta*.

Shell elongate-conic, turrated, milk-white. Nuclear whorls small, three, helicoid, rather loosely coiled and elevated, having their axis at a right angle to the axis of the later whorls and about one-third immersed in the first of them. Post-nuclear whorls flattened, strongly sculptured, with axial ribs and three spiral keels. There is a strong, rounded, rather broad spiral keel on each side of the deeply sulcate periphery; the peripheral sulcus is about as wide as a keel and marks the path for the shouldered and crenulated summit of the succeeding whorls. A second deep spiral sulcus, equal in width to the peripheral

one, is situated just posterior to the posterior keel, and this marks the anterior termination of the strong, rounded, backward-slanting axial ribs between the sutures. Sixteen of these ribs occur upon the second, seventeen upon the fifth, and twenty upon the penultimate whorl. Intercostal spaces almost as wide as the ribs, crossed by two strongly impressed, moderately broad spiral lines, which also pass over and somewhat constrict the axial ribs, giving them a dumbbell-shaped outline; the posterior thickened portion is a little wider than the anterior one. The space between these two deeply impressed lines is crossed by about eight minute, subequally spaced spiral striations. Periphery of the last whorl deeply sulcate, crossed by numerous closely spaced axial striations, keel anterior to the periphery almost as strong as the one posterior to it; the third keel is a little anterior to the middle of the base and is rather low and broad; the space between it and the keel above is gently rounded and finely axially striated, which is also true of the space between this keel and the umbilical area. Aperture moderately large, suboval, effuse at the junction of the outer lip and columella; posterior angle obtuse, outer lip thin, irregular in outline, showing the external sculpture within; columella short, curved, stout, bearing a strong, acute, oblique fold a little anterior to its insertion; parietal wall covered by a thin callus.

There are two lots of this species in the Berlin collection, both from Japan; one, No. 1446, containing two specimens, was received from H. Adams, and it is one of these that we have here described and figured. This specimen has nine post-nuclear whorls and measures: long. 4.4 mm.; diam. 1.5 mm. The other belongs to the Paetel collection.

ODOSTOMIA (TRABECULA) TANTILLA A. Adams.

Plate XXII, fig. 3.

*Pyrgulina tantilla* A. ADAMS, Jour. Linn. Soc. London, VII, 1863, p. 5.

Shell small, slender, turrated, milk-white. Nuclear whorls small, strongly obliquely immersed in the first post-nuclear whorl, only a portion of the last volution is visible. Post-nuclear whorls strongly shouldered, moderately rounded, rather high between the sutures, and appearing somewhat constricted at this point, marked by strong, rounded, backward slanting axial ribs, which render the summits of the whorls strongly crenulate; fourteen of these ribs occur upon the second, twenty-three upon the fourth, and thirty-two upon the penultimate whorl. Intercostal spaces about twice as wide as the ribs, crossed between the sutures by five subequally spaced, raised spiral threads, the posterior one of which is a little farther from the summit than it is from its adjacent fellow; it is also a little less strongly developed than the rest. The ribs and spiral threads thus form a series of meshes or reticulations. Periphery and base of the last

whorl well rounded, sculptured, like the spaces between the sutures, by the axial ribs which continue prominently to the narrow umbilicus, and six subequal and subequally spaced spiral threads, with an indication of a very weak seventh within the narrow umbilicus. Aperture moderately large, ovoid, posterior angle obtuse, outer lip strong, columella slender, decidedly curved, and somewhat revolute, with a prominent oblique fold near its insertion; parietal wall covered by a very strong callus, which gives the peristome a complete appearance.

The U. S. National Museum has two specimens from A. Adams, collected in Japan, No. 126005, the larger one of which has furnished the figure and the above description, excepting the aperture, which is imperfect in this specimen and was described from the second individual. The large one has seven post-nuclear whorls and measures: long. 2.6 mm.; diam. 0.9 mm. The Pætel collection contains one from Japan.

ODOSTOMIA (PARTHENINA) META, new species.

Plate XXIII, fig. 5.

Shell milk-white, very small, thin, turritid, with channeled sutures and obtuse apex. Nuclear whorls small, strongly obliquely immersed in the first post-nuclear whorl; only a portion of the last volution is visible. Post-nuclear whorls somewhat overhanging, rather high between the sutures, shouldered at the summit, flattened, suddenly contracted below the periphery. The summits of succeeding whorls fall considerably anterior to the periphery, which appears decidedly angular. The whorls are marked by strong axial ribs which extend undiminished over the angular periphery and base of the last whorl to the umbilical region. Sixteen of these ribs occur upon the second, twenty-two upon the fourth and the penultimate whorl. The ribs are slightly constricted just below the summit, which gives them a beaded appearance. Intercostal spaces about twice as wide as the ribs, crossed by two closely placed, raised spiral threads, the anterior one of which marks the angulation of the periphery. The junction of ribs and spiral threads is subnodulose. Base moderately long, narrowly umbilicate. Aperture suboval, posterior angle obtuse, outer lip rather thick, columella strongly curved, with a prominent oblique fold near its insertion; parietal wall covered with a heavy callus, which gives the peristome a completed aspect.

The specimen described belongs to the Pætel collection and comes from Japan. It has six post-nuclear whorls and measures: long. 2.1 mm.; diam. 0.8 mm.

## ODOSTOMIA (CHRYSALLIDA) DUX, new species.

Plate XVII, fig. 4.

Shell ovate-conic, white. Nuclear whorls moderately large, obliquely deeply immersed in the first post-nuclear whorl, the peripheral portion only of the last volution projects above the edge. Post-nuclear whorls moderately rounded, strongly crenulately shouldered, marked between the sutures by four spiral keels, the posterior two of which are a little more closely spaced than the rest and twenty axial ribs which do not extend entirely across the whorl but terminate at the sulcus which separates the third from the fourth keel. Each junction of an axial rib and a spiral keel is marked by a tubercle; the tubercles of the first and second keel belonging to the same axial rib are somewhat fused, there being a less prominent constriction between them than between the second and third, the complete effect being that of an exclamation point. The fourth spiral keel is strong and rounded and decidedly elevated, a very slender extension of the axial rib reaches across the deep spiral sulcus, which like the sulci of the base is crossed by fine, subequally spaced, raised axial threads. Base moderately well rounded, attenuated, ornamented with five subequal and subequally spaced, somewhat flattened, spiral keels. Aperture rather large, sub-oval, effuse at the junction of the outer lip and the columella; posterior angle acute, outer lip wavy, thin, showing the external sculpture within; columella strong, curved, reenforced by the attenuated base, provided with a strong fold at its insertion; parietal wall covered by a thin callus.

The type has four post-nuclear whorls, and measures: long, 1.8 mm.; diam. 1 mm. It is from Japan and belongs to the Paetel collection.

Of the twenty-eight species described as *Chrysallida* by A. Adams, we have been able to refer only one positively to this group, namely *C. plicata*.

## ODOSTOMIA (PYRGULINA) DENSECOSTATA Garrett.

Plate XVIII, fig. 4.

Shell elongate-ovate, very thin, subdiaphanous, milk-white, shining. Nuclear whorls almost completely obliquely immersed in the first post-nuclear whorl. Post-nuclear whorls rounded, rather inflated, moderately shouldered, and marked by many well-developed, regular, rounded, toward the aperture slanting axial ribs, of which twenty occur upon the second, twenty-four upon the fifth, and thirty upon the penultimate whorl. These ribs are somewhat thickened at their posterior extremity and give the summits of the whorls a beaded appearance. Intercoastal spaces a little wider than the ribs, crossed by many incised spiral lines, which are about as wide as the raised spaces between them. These incised spiral lines are a little less strongly developed on the

posterior portion of the whorls, where the ribs are thickened, but anterior to these thickenings they are very regular and regularly spaced. There are eighteen on the fifth and twenty-six on the penultimate whorl. Periphery and base of the last whorl well rounded, the latter marked by the strong continuations of the axial ribs, which extend almost undiminished to the umbilical region. The intercostal spaces on the base are marked like those between the sutures by twenty-two incised spiral lines. Sutures well marked. Aperture moderately large, posterior angle acute, outer lip thin, showing the external sculpture within; junction of columella and outer lip well rounded; columella decidedly curved, thin, somewhat revolute, provided with a prominent oblique fold, a little anterior to its insertion. This fold joins the columella in such a manner as to give this a decidedly sigmoid curve. Parietal wall without callus.

Garrett's types embrace six specimens, all from the Viti Islands. The best developed one is here described and figured. It has eight post-nuclear whorls, and measures: long. 4 mm.; diam. 1.7 mm. The specimens belong to the Academy of Natural Sciences, Philadelphia, where they are entered as No. 58110. P. Fischer<sup>a</sup> considered this species synonymous with *Odostomia* (= *Pyrgulina*) *interstriata* Souverbie. In this we do not agree with him, but consider the present species distinct.

ODOSTOMIA (PYRGULINA) DENSECOSTATA UPOLUENSIS, new subspecies.

Plate XVIII, fig. 1.

Shell elongate-conic, subturritid, early whorls bluish-white, later ones milk-white. Nuclear whorls small, almost completely obliquely immersed in the first post-nuclear whorl; only half of the tilted last revolution can be seen. Post-nuclear whorls slightly rounded, the posterior two-thirds between the sutures almost flattened, somewhat shouldered, marked by strong obliquely backward-slanting rounded axial ribs which are somewhat thickened and subcuspidate at the summits; fourteen of these ribs occur upon the first, eighteen upon the third, twenty-four upon the fifth and on the penultimate whorl. Intercostal spaces somewhat variable in width, one to one and one-half times as wide as the ribs, crossed by fine subequal and subequally spaced impressed spiral lines, the spaces between them being a little wider than the impressed lines; about twenty of these lines occur between the sutures on the fifth and twenty-two upon the penultimate whorl. Periphery and base of the last whorl well rounded, the latter marked like the spaces between the sutures by the strong continuation of the axial ribs, which extend undiminished to the small umbilical

<sup>a</sup>Jour. de Conch., XXIV, 1876, p. 150.

chink, and by twenty impressed spiral lines which here are almost as wide as the spaces between them. Aperture suboval, outer lip thin, showing the external sculpture within; columella slender, curved, and reflected, with a moderately strong, oblique fold at its insertion; parietal wall covered by a moderately thick callus which gives the peristome an almost continuous appearance.

The type and another specimen belong to the Pætel collection and come from Upolu, one of the Samoan Islands. The type has seven post-nuclear whorls and measures: long. 3.7 mm.; diam. 1.5 mm. It differs from *O. (P.) densecostata* Garrett in being more slender, having the whorls less inflated and rounded (*densecostata* has them decidedly rounded) and in having a greater number of axial ribs.

ODOSTOMIA (PYRGULINA) ALVEATA A. Adams.

Plate XXII, fig. 5.

*Chrysallida alveata* A. ADAMS, Ann. Mag. Nat. Hist., VII, 1861, p. 45.

Shell small, oblong, ovate, milk-white. Nuclear whorls decollated. Post-nuclear whorls rather high between the sutures, moderately rounded, strongly shouldered at the summit, which is subtabulated, crossed by strong, rounded, almost vertical axial ribs, which render the summit of the whorls crenulate. Eighteen of these ribs occur upon the third, and nineteen upon the penultimate whorl. Intercostal spaces about one-half as wide as the ribs, crossed by about twelve fine, subequally spaced, incised spiral lines. The summits of succeeding whorls fall a little anterior to the somewhat angulated periphery of the preceding whorl on the earlier volutions, and gives them a somewhat constricted appearance at the deep sutures. Periphery of the last whorl very faintly angulated. Base well rounded, somewhat pinched at the umbilical region, marked by the strong continuations of the axial ribs, and about ten spirally incised lines in the spaces between them. Aperture oval, posterior angle obtuse, outer lip thick (fractured) showing seven equally well-developed and equally spaced internal lirations; columella short, decidedly curved and revolute, with a strong oblique fold at its insertion; parietal wall covered by a thin callus.

The specimen described and figured belongs to the Pætel collection and comes from Japan. It has five post-nuclear whorls, and measures: long. 2. mm.; diam. 1.1 mm. It is badly worn, which prevents making an accurate count of the incised spiral lines; there are, however, probably twenty between the suture and the summit on the penultimate whorl and perhaps a similar number on the base. Adams in his description does not mention the internal lirations of the outer lip, but these are usually deep-seated, or appear at intervals, and may not have been apparent in the specimen originally described.



## ODOSTOMIA (PYRGULINA) LECTA, new species.

Plate XXII, fig. 2.

Shell elongate-ovate, turritid, shouldered, sutures crenulated, shining, hyaline to milk-white. Nuclear whorls moderately large, deeply obliquely immersed in the first of the succeeding whorls, only the last half turn of the last volution is visible from the side. Post-nuclear whorls rather high between the sutures, somewhat flattened, the summit of the succeeding whorls falls a little anterior to the periphery of the preceding one, which gives the whorls a constricted appearance at the suture. The whorls are ornamented by strong sublamellar axial ribs, which are thickened and cuspid at the summit; fourteen of these ribs occur upon the first, sixteen upon the third, and twenty upon the penultimate whorl. Intercostal spaces broad and rounded, fully three times the width of the ribs, crossed by narrow, incised spiral lines, which are about one-fourth as wide as the space inclosed between them; twelve of these lines occur between the sutures upon the fourth and penultimate whorls. Periphery and base of the last whorl well rounded, the latter attenuated, marked like the space between the sutures by the prominent continuations of the axial ribs and ten incised strong, spiral lines. Aperture suboval (outer lip fractured), columella short, curved, reenforced by the attenuated base, provided with a strong, oblique fold near its insertion; parietal wall covered by a moderately thick callus, which extends over the umbilical area.

The specimen described has six post-nuclear whorls and measures: long. 3.4 mm.; diam. 1.5 mm. It belongs to the Patel collection and was labeled *Chrysallida plicata* A. Adams, Japan. It is not *C. plicata* A. Adams, but may be one of the following species, of which Adams's description is not sufficiently diagnostic to make identification possible without authentic material: *Chrysallida pupula*, *consobrina*, and *casta*, all of which appear to belong to the subgenus *Pyrgulina*.

## ODOSTOMIA (PYRGULINA) AMANDA Garrett.

Plate XVIII, fig. 3.

*Ostomia amanda* GARRETT, Proc. Acad. Nat. Soc.-Phila., 3d ser., III, 1873, p. 225. pl. III, fig. 47.

Shell, slender; elongate, conic, milk-white. Nuclear whorls, three; moderately large, helicoid, having their axis at a right angle to the axis of the later whorls and scarcely immersed in the first of them. Post-nuclear whorls moderately rounded, somewhat shouldered, ornamented by strong rounded vertical or slightly backward-slanting axial ribs which are thickened at the summit to form small cusps. Sixteen of

these ribs occur upon the first, twenty upon the third, twenty-two upon the fifth, and twenty-six upon the penultimate whorl. Intercostal spaces, about as wide as the ribs, crossed by well-incised, equal and subequally spaced spiral lines which are about one-fourth as wide as the spaces inclosed between them. There are no spiral lines in the intercostal spaces near the summit of the whorls; the first one falls about parallel with the anterior limit of the cuspid summit of the axial ribs; nine lines occur between the sutures on the fourth, eleven on the fifth, and twelve on the penultimate whorl. Periphery of the last whorl very slightly angulated. Base well rounded, marked by strong continuations of the axial ribs, which extend to the umbilical region, and eighteen incised spiral lines in the intercostal spaces; these lines gradually become more crowded toward the umbilical region. Aperture moderately large, suboval, somewhat effuse at the junction of the outer lip and columella; posterior angle acute, outer lip thin, showing the external sculpture within; columella oblique, slightly curved, and somewhat revolute, reenforced by the somewhat attenuated basal portion of the last whorl; provided with a weak oblique fold at its insertion; parietal wall without perceptible callus.

The specimen described and figured is Garrett's type. It belongs to the Philadelphia Academy of Natural Sciences, where it is entered as No. 58109. It comes from the Viti Islands, has seven post-nuclear whorls and measures: long. 3 mm.; diam. 1.1 mm. The Patel collection contains a specimen which was collected at Upolu, one of the Samoan Islands.

#### EGILINA, new subgenus.

*Odostomias* having strong axial ribs between the sutures which are interrupted at the periphery by a deep spiral sulcus. Intercostal spaces smooth. Base ornamented by spiral keels, the spaces between which are marked by many very slender axial threads.

*Type*.—*Odostomia (Egilina) mariella* A. Adams.

#### ODOSTOMIA (EGILINA) MARIELLA A. Adams.

Plate XXII, fig. 4.

*Parthenia mariella* A. ADAMS, Ann. Mag. Nat. Hist., VI, 1860, p. 415.

Shell small, umbilicated, regularly conic with obliquely truncated apex and deeply channeled sutures; milk-white. Nuclear whorls almost completely immersed in the first post-nuclear whorl; only half of the last volution projects above it. Post-nuclear whorls flattened, marked by strong, very obliquely backward-slanting axial ribs, which are thickened at the summits and constricted a little below the summit, which renders the top of each rib beaded. Anteriorly the ribs are terminated by the posterior margin of the peripheral sulcus; here the ribs expand somewhat and almost fuse, and this expansion gives

them a subnodulose effect at this point. Intercostal spaces smooth, about as wide as the axial ribs, decidedly depressed in the middle—that is, between the bead at the summit and the nodules at the periphery. Periphery of the last whorl deeply sulcate. Base well rounded, marked by about nine spiral lirations, the posterior one of which is decidedly wider than the rest; the depressed spaces between the lirations are marked by fine axial threads. Both the spiral lirations and the spaces between them gradually diminish in width from the periphery to the umbilical area. Aperture suboval, posterior angle acute, columella strongly oblique, somewhat revolute, reenforced by the somewhat attenuated base and provided with a fairly strong oblique fold near its insertion; parietal wall covered by a thick callus, which gives the peristome a continuous appearance. On the last whorl the first basal keel appears above the sutures, which is therefore not channeled like the sutures of the preceding whorls.

The specimen described has four post-nuclear whorls and measures: long. 1.8 mm.; diam. .8 mm. It belongs to the Patel collection and comes from Japan. It was labeled *Parthenia pagodula* A. Adams, but is not that species.

ODOSTOMIA (MIRALDA?) JAMAICENSIS Clessin.

Plate XVII, fig. 6.

*Miralda jamaicensis* CLESSIN, Martini-Chemnitz, Conchylien Cabinet, 2d ed., Pyramid., 1900, p. 262, pl. XXXIV, fig. 6.

Shell elongate-ovate, turritid, milk-white. Nuclear whorls two, small, helicoid, obliquely half immersed in the first of the succeeding volutions. Post-nuclear whorls moderately rounded, strongly tabulately shouldered at the summit, ornamented by broad, slightly rounded spiral keels, three of which occur between the sutures on the first and second, and four upon the penultimate whorl. The posterior one of these keels is situated at the summit of the whorl and is not as wide as the others, and appears as if it might be strongly crenulated in well-preserved specimens. The second keel also shows traces of crenulations. The incised channels between the keels are about one-fourth as wide as the keels and are crossed by very fine, raised, quite closely spaced, backward-slanting axial threads. Periphery and base of the last whorl well rounded. The latter marked by a strong raised spiral keel on its middle and a lesser tumid area at the umbilical region; the space between the middle keel and the periphery appears to be without spiral sculpture. The entire base is crossed by lines of growth. Sutures very strongly channeled. Aperture large, broadly oval, somewhat produced at the junction of the columella and lip; posterior angle obtuse, outer lip rather thick; columella strong, curved, reenforced by the attenuated base and provided with a moderately strong oblique fold near its insertion.

There are two specimens in the Berlin collection, No. 28742, from Jamaica, obtained by Verkruzen: they have the aspect of Bowden bed fossils. The best preserved individual has four post-nuclear whorls and measures: long. 2.1 mm.: diam. 1.2 mm. If the specimens prove to be not crenulated, but simply spirally keeled, then it will have to be transferred to the subgenus *Oletta*. Clessin's figure of this species<sup>a</sup> is wretchedly poor.

ODOSTOMIA (MIRALDA) DIADEMA A. Adams.

Plate XVII, fig. 2.

*Parthenia diadema* A. ADAMS, Ann. Mag. Nat. Hist., V, 1860, p. 479.

Shell small, subovate, minutely umbilicated, with the summits of the whorls decidedly tabulated, white. Nuclear whorls two, moderately large, helicoid, about one-third immersed in the later whorls. Post-nuclear whorls moderately rounded, decidedly tabulated at the summit, ornamented by rounded, axial ribs which quickly diminish in strength as they pass from the summit of the whorls to the periphery: sixteen of these ribs occur upon the second, and twenty upon the penultimate whorl. The ribs are thickened at the anterior termination of the shoulder and render it decidedly crenulated. Intercostal spaces a little wider than the ribs. In addition to the axial ribs the whorls are marked by strong spiral cords, two of which can be seen between the sutures on the first and second and four and one-half upon the penultimate whorl; the junction of the posterior one of these two cords and the axial ribs form a series of tubercles. The anterior cord is only slightly tuberculated, the ribs extending only feebly to it. Periphery and base of the last whorl well rounded, the latter decidedly attenuated and marked by seven subequal and subequally spaced spiral keels. Aperture large, suboval, posterior angle very obtuse, outer lip thick, columella reinforced by the attenuated base, curved, provided with a conspicuous oblique fold near its insertion; parietal wall covered by a moderately thick callus.

There are two specimens of this species in the Berlin collection, collected in Japan and obtained from H. Adams. The better preserved one of the two has been described. It has five post-nuclear whorls and measures: long. 2.3 mm.: diam. 1.2 mm.

ODOSTOMIA (MIRALDA) GEMMA A. Adams.

Plate XXII, fig. 1.

*Chrysalida gemma* A. ADAMS, Ann. Mag. Nat. Hist., VIII, 1861, p. 302.

Shell small, elongate-conic, slender, slightly umbilicated, white. Nuclear whorls at least two, obliquely about half immersed in the first of the later whorls. Post-nuclear whorls flattened, with strong

<sup>a</sup>Martini-Chemnitz, Conchylien Cabinet, 1900, p. 262, pl. xxxiv, fig. 6.

tabulated and crenulated summits, crossed by three strong, rounded, subequally spaced, spiral keels and rounded axial ribs between the sutures; the latter extend from the summit to and over the second keel, but not over the sulcus separating this from the third. The junctions of the axial ribs and spiral keels form strong tubercles. Sulcus between the second and third keel deep, decidedly deeper than the peripheral sulcus, both of which, as well as the sulci of the base are crossed by minute closely placed, axial raised threads. Base of the last whorl well rounded, somewhat attenuated, marked by five strong, rounded, subequal and subequally spaced spiral keels. Aperture oval, posterior angle acute, outer lip wavy, columella short, curved and slightly revolute, provided with a quite strong oblique fold near its insertion; parietal wall covered by a moderately thick callus.

The specimen described and figured belongs to the Patel collection and comes from Japan. It has six post-nuclear whorls and measures: long. 3.2 mm.; diam. .8 mm. The U. S. National Museum has a specimen, No. 185889, from H. Adams, also from Japan.

ODOSTOMIA (MIRALDA) species?

The Patel collection contains another specimen of *Miralda* which is in every way heavier than *O. (M.) diadema* A. Adams. It is, however, so badly worn that positive identification at the present time is impossible. It has five post-nuclear whorls and measures: long. 2.2 mm.; diam. 1.4 mm. It is labeled *Miralda diadema* A. Adams, and comes from Japan, but is not that species.

ODOSTOMIA (MENESTHO) EXARATISSIMA, new name.

Plate XIX, figs. 3, 7.

= *Menestho exarata* A. ADAMS, Ann. Mag. Nat. Hist., VIII, 1861, p. 303, not *Parthenia exarata*, CARPENTER, 1856.

Shell elongate-conic, soiled white. Nuclear whorls at least two, moderately large, helicoid, one-half obliquely immersed in the first post-nuclear volution, the periphery projecting slightly beyond the left outline of the spire. Post-nuclear whorls well rounded, very slightly shouldered, marked by faint lines of growth and well incised spiral lines, which are not all of the same strength nor are they equally spaced. Six of these appear upon the second, and seven upon the penultimate whorl between the sutures. Periphery and base of the last whorl well rounded, the latter sculptured like the space between the sutures, bearing six incised lines which are not quite as strong as those between the sutures. Aperture oval, effuse at the junction of the outer lip and the columella, posterior angle obtuse, outer lip thin, but opaque, columella short, curved, somewhat revolute, reenforced by the attenuated base, parietal wall covered by a faint callus.

There are five specimens of this species in the Berlin collection. They were obtained by Hilgendorf at Hakodate, Japan. The one above described has six post-nuclear whorls and measures: long. 4.2 mm.; diam. 1.9 mm. There is considerable diversity in the expression of the incised spirals in the several specimens; in one they are almost obsolete on the base. One individual is decidedly more obese than the rest (fig. 3). It has six post-nuclear whorls and measures: long. 4.8 mm.; diam. 2.5 mm. Another badly-worn individual from Japan was labeled *Vanesia exarata* A. Adams.

ODOSTOMIA (ODETTA) LECTISSIMA, new species.

Plate XXIII, fig. 3.

Shell elongate, ovate, milk-white. Nuclear whorls moderately large, almost buried in the first post nuclear whorls, only the tumid periphery of the last volution and a mere speck of another turn are visible. Post-nuclear whorls inflated and strongly, slopingly shouldered, ornamented between the sutures by five spiral keels, the posterior one of which is much less developed than the rest and occupies the space at the suture on the shoulder. The other four are strong, well rounded, subequal and subequally spaced. The first one is at the shoulder, and the anterior edge of the fourth bounds the peripheral sulcus. The sulci between these spiral cords are deep, a little wider than the cords and crossed by very regular and regularly spaced, backward-slanting, raised axial threads, which, were they not interrupted by the spiral keels, would form continuous lines from the summits to the umbilical region. Base of the last whorl short, well rounded, somewhat pinched behind the columella but not perforated, sculptured like the space between the sutures, having five spiral keels. Aperture large, somewhat produced at the junction of the outer lip and the columella; posterior angle obtuse; outer lip thin, decidedly wavy in outline, showing the external sculpture within; columella straight, slender, somewhat revolute, with a weak fold near its insertion which is not apparent when the aperture is viewed squarely; parietal wall covered by a thin callus.

The type belongs to the Patel collection and is from Japan. It has four post-nuclear whorls and measures: long. 1.7 mm.; diam. .1 mm.

ODOSTOMIA (ODETTA) FELIX, new species.

Plate XXI, fig. 2.

Shell broadly elongate-conic, turritid, subdiaphanous. Nuclear whorls small, almost completely obliquely immersed, only part of the last rounded volution is visible above the first of the later whorls. Post-nuclear whorls somewhat inflated, well rounded, moderately shouldered, marked by strong, equally developed, spiral keels which are separated by subequal, deep, rounded sulci. The latter are somewhat

broader than the keels and crossed by many, very slender raised axial threads. Three keels are present upon the first and second, on the third a fourth keel appears partly at the suture, but the greater part of it is covered up by the summit of the succeeding volution. The penultimate whorl has four keels, the posterior one of which marks the summit and is a little wider than the rest and somewhat flattened. Periphery of the last whorl marked by a sulcus. Base well rounded, attenuated, ornamented like the spaces between the sutures, having six spiral keels. These keels, as well as the sulci, gradually diminish in breadth from the periphery to the umbilical region. Aperture oval, outer lip thin, showing the external sculpture within; columella rather heavy, somewhat curved, backed up by the attenuated base and provided with a strong oblique fold at its insertion; parietal wall covered by a thin callus.

The type belongs to the Patel collection and comes from Japan. It has five and one-half post-nuclear whorls and measures: long, 2.6 mm.; diam., 1.3 mm. It was labeled *Evalea lirata* A. Adams, but is not that species. The U. S. National Museum has two specimens of *Odostomia* (*Odetta*) *lirata* A. Adams, from the author, which are much smaller, more slender, more oval, and less prominently sculptured than the present species.

ODOSTOMIA (ODETTA) CIRCINATA A. Adams.

Plate XXIII, fig. 6.

*Oscilla circinata* A. ADAMS, Proc. Zool. Soc., 1867, p. 311.

Shell elongate-oval, subdiaphanous. Nuclear whorls small, almost completely immersed in the first post-nuclear whorl, only the rounded two-thirds of the last volution are visible, and those indicate that the axis of the nuclear turns must be at a right angle to the axis of the later whorls. Post-nuclear whorls moderately well rounded, the last one somewhat inflated, shouldered, marked by strong, broadly rounded, subequal and subequally spaced spiral keels, which are separated by deep, rounded sulci, which are about as wide as the keels. The sulci are crossed by extremely fine and very closely spaced axial raised threads which pass up on the sides of the spiral keels, but do not cross their summits. The second and third whorls have three keels between the sutures. On the third the posterior keel at the summit of the whorl, which is a little wider than the other two, shows a spiral striation on its middle. This grows gradually stronger as the shell advances, until on the penultimate whorl it has divided this keel into two, the posterior one of which is a little less developed than the anterior one, which resembles the other between the sutures. The summit of the last whorl falls considerably below the periphery, showing five spiral keels between the sutures on the penultimate whorl. Periphery of the last whorl sulcate, sulcus like the rest and similarly sculptured.

Base well rounded, somewhat attenuated anteriorly, sculptured like the spaces between the sutures, having seven spiral keels; these keels diminish somewhat in size from the periphery to the umbilical area. Aperture subovate, posterior angle acute, outer lip thin, wavy, showing the external sculpture within, columella decidedly curved, reinforced anteriorly by the attenuated base, provided with a very strong, acute, oblique fold near its insertion; parietal wall covered by a thin callus.

There are two specimens of this species in the Patel collection. The one described and figured has five post-nuclear whorls and measures: long. 2.1 mm.; diam. 1 mm. This species closely resembles *Odostomia* (*Evalea*) *livata* A. Adams. It is, however, more compact than that species and has two more spiral keels on the base. *O. (E.) livata* is not an *Evalea*, but belongs to the subgenus *Odetta*; the name should read *Odostomia (Odetta) livata* A. Adams.

ODOSTOMIA (EVALEA) SITKAENSIS Clessin.

Plate XVII, fig. 8.

*Odostomia sitkaensis* CLESSIN, Mart. Chem. Conch. Cab., 2d Ed., Pyramid., 1900, p. 121, pl. xxx, fig. 1.

Shell elongate-conic, very regular in outline, yellowish white, shining. Nuclear whorls almost completely immersed in the first of the succeeding volution. Post-nuclear whorls moderately rounded, rather high between the sutures, slightly shouldered at the summits, marked by many fine lines of growth and numerous fine wavy spiral striations; the latter are more regularly developed and distributed than the lines of growth. (Our figure does not show the spiral markings.) The periphery of the last whorl marks the greatest diameter of the shell. The base, though rather long, falls off rather abruptly at the periphery, then tapers gradually to the anterior end of the columella; it is marked like the spaces between the sutures. Aperture large, oval; posterior angle acute, outer lip decidedly curved, almost patulous, thin; columella long, slender, gently curved, and somewhat reflected, provided with a moderately strong, oblique fold near its insertion. Parietal wall without callus.

The Berlin collection contains two specimens of this species—No. 26232, which were collected by F. Schmidt, at Sitka, Alaska. We have described and figured the most perfect of the two, which we consider Clessin's type. This specimen measures: long. 4 mm.; diam. 2 mm. Clessin's figure is worthless, as usual.



## ODOSTOMIA (EVALEA) CULTA, new species.

Plate XXVI, fig. 9.

Shell regularly conic, umbilicated, yellowish white. Nuclear whorls apparently planorboid, very obliquely, almost completely, immersed in the first of the later whorls, only a portion of the last volution being visible. Post-nuclear whorls rather high between the sutures, slightly rounded (almost flattened), and subtabulately shouldered at the summits, marked by fine lines of growth and very many subequal, wavy, closely spaced striations. (These have not been indicated in our drawing.) The whorls are somewhat angulated at the periphery and the summit of succeeding whorls falls a little anterior to the periphery, which gives the sutures a decidedly channeled effect. Base of the last whorl large, rather prolonged, well rounded, marked by spiral striations which are equally as abundant as those between the sutures but somewhat stronger. Aperture moderately large, suboval, somewhat effuse anteriorly, posterior angle obtuse, outer lip thin (fractured), columella slender, curved, reflected partly over the moderately large umbilicus, provided with a strong, acute, oblique fold near its insertion; parietal wall covered by a thin callus.

The type was collected at Hakodate, Japan, by Hilgendorf. It has six post-nuclear whorls and measures: long. 4 mm.; diam. 1.8 mm.

This is a moderately large species characterized by its spiral striations, regular conic outline, and the constricted appearance of the whorls at the channeled sutures. It is evidently related to *Odostomia (Evalea) arcuata* A. Adams.

## . ODOSTOMIA (AMAURA) MARTENSI, new name.

Plate XXV, fig. 5.

*Odostomia curta* CLESSIN, Mart. Chem. Conch. Cab., 1900, p. 116, pl. xxviii, fig. 3.

Not *Odostomia curtum* DESHAYES, An. Sans. Vert. Paris Basin, 1864, p. 551, pl. xix, figs. 9-11.

Shell ovoid, heavy, yellowish white, nuclear whorls small, almost completely-immersed in the first of the succeeding volutions. Post-nuclear whorls increasing regularly and rapidly in size, inflated, subtabulately shouldered at the summit, marked by numerous fine lines of growth and equally abundant, closely placed, wavy, spiral striations. These lines of growth and spiral markings give the surface a finely reticulated appearance when viewed under high magnification. (We have omitted this sculpture in our drawing, which should be considered as an outline sketch only.) Periphery and base of the last whorl decidedly rounded and inflated, marked like the space between the sutures. Aperture large, suboval, slightly effuse anteriorly, posterior angle acute; outer lip sharp at the edge but thick within; columella very strong, curved, reenforced by the body whorl from which the

slightly reflected edge is separated only by a narrow line. A strong oblique fold, not completely visible when the aperture is viewed squarely, is located a little anterior to the insertion of the columella.

The type has five post-nuclear whorls and measures: long, 5.3 mm.; diam. 3.1 mm. Clessin gives the diam. as 1.3, evidently a transposition. He also cites the registration No. as 36336, while it should be 36335. His figure *almost* represents this species. The type comes from Killisnoo, Alaska, not Japan.

ODOSTOMIA (AMAURA) KRAUSEI Clessin.

Plate XXIII, fig. 2.

*Odostomia krausei*, CLESSIN, Mart. Chem. Conch. Cab., 2d ed., Pyramid., 1900, p. 115, pl. XXVIII, fig. 1.

Shell elongate-conic, thick and heavy, rough through erosion, yellowish white. Nuclear whorls decollated in the type (judging from the pit in the apex they are probably deeply, obliquely immersed). Post-nuclear whorls only moderately rounded, somewhat shouldered at the summit (surface decidedly eroded). Periphery and base of the last whorl well rounded, the latter with a minute umbilical chink. Aperture auricular, somewhat effuse anteriorly, posterior angle scarcely acute; outer lip very thick; columella thick, reflexed, with a broad, strong, oblique fold, a little anterior to its insertion; parietal wall covered by a thick callus.

The type has six post-nuclear whorls and measures: long, 9.9 mm.; diam. 5 mm. It was collected by Krause at Killisnoo, which is in Alaska and not in Japan as stated by Clessin. The registration number of his type in the Berlin Museum is also wrong; the specimen described and figured by him is 36335 and not 36336 as given in his account of the species.

The U. S. National Museum has two lots, one specimen, 159454, from Killisnoo, collected by Krause, and another, No. 159471, from Kadiak. They are both much eroded and can furnish no additional data to our text.

Clessin's figure cited above, will not enable any one to recognize this form.

ODOSTOMIA (ODOSTOMIA) DESIMANA, new name.

Plate XXV, fig. 3. Plate XXVI, fig. 2.

*Odostomia lactea* DUNKER, Mal. Blätt., VI, 1860, p. 234; also Moll. Jap., 1861, p. 17, pl. XI, fig. 4, not *Odostomia lactea* J. G. JEFFREYS, Ann. Mag. Nat. Hist., 11, 1848, p. 348 (= *Turbonilla lactea* LINNÆUS), nor *Odostomia lactea* ANGAS, Proc. Zool. Soc., 1867, p. 112, pl. XIII.

Shell regularly elongate-conic, milk-white. Nuclear whorls small, obliquely almost completely immersed in the first of the succeeding whorls, only the periphery of the last two being visible. Post-nuclear

whorls rather high between the sutures, very slightly rounded, slightly angulated at the periphery and scarcely at all shouldered, marked by scarcely perceptible lines of growth, and here and there by a faint trace of some very fine microscopic spiral lines. The summit of succeeding whorls falls somewhat anterior to the periphery of the preceding turns, which gives a slightly constricted appearance at the well-impressed suture. Periphery of the last whorl faintly angulated; base large, well rounded, narrowly umbilicated and somewhat effuse at the junction of the lip and columella, posterior angle acute, outer lip (fractured), thin, columella long, slender, almost straight, somewhat revolute, bearing a strong oblique fold near its insertion; parietal wall covered by a thin callus.

The specimen described is Dunker's type which comes from Desima, Japan. It is not quite mature, having seven and one-half post-nuclear whorls and measures: long. 5.3 mm.; diam. 2.2 mm. The Dunker collection contains an additional specimen from Nagasaki, Japan, of which we also give a figure. This is adult. It has nine post-nuclear whorls and measures: long. 6.7 mm.; diam. 2.8 mm. The chief difference between this and the young shell lies in the aperture, the outer lip in this case being rather patulous. The Pætel collection has one specimen from Nagasaki, Japan.

**ODOSTOMIA (ODOSTOMIA) MAURITIANA, new species.**

Plate XXVI, fig. 6.

Shell small, umbilicated, elongate-ovate conic, semitransparent, polished. Nuclear whorls two and one-half, moderately large, helicoid, elevated, about one-fifth immersed in the first of the succeeding whorls and having their axis at a right angle to them. Post-nuclear whorls flattened, angulated at the periphery and weakly shouldered at the summit; the latter falls somewhat anterior to the periphery of the preceding whorl and lends to it a somewhat constricted appearance at the well-impressed suture. The whorls are marked by extremely fine, closely placed, wavy spiral striations, which are visible only under very high magnification. Periphery of the last whorl somewhat angulated. Base very broad, gently rounded, somewhat pinched at the narrow umbilicus. Aperture elongate-ovate, somewhat prolonged at the junction of the outer lip and columella; posterior angle acute, outer lip thin, somewhat effuse, columella slender, decidedly curved, slightly revolute, provided with a prominent oblique fold at its insertion; parietal wall covered by a strong callus which lends the peritreme an almost continuous appearance.

The specimen described and figured belongs to the Pætel collection and comes from Mauritius. It has five post-nuclear whorls and measures: long. 2.1 mm.; diam. 1.1 mm.

## ODOSTOMIA (ODOSTOMIA) HILGENDORFI Clessin.

Plate XXIV, fig. 5.

*Odostomia hilgendorfi* CLESSIN, Mart. Chem. Conch. Cab., 2d ed., Pyramid., 1900, p. 119, pl. XXVIII, fig. 5.

Shell broadly elongate-conic, very regularly tapering, subturritid, milk-white. Nuclear whorls two and one-half, small, helicoid, well rounded, moderately elevated, about one-third immersed in the first of the later whorls, having their axis almost at a right angle to them. Post-nuclear whorls rather high between the sutures, flattened, subtabulately shouldered at the summits and decidedly angulated at the periphery, marked by lines of growth and extremely fine, microscopic, closely placed, wavy, spiral striations. The shouldered summits of succeeding whorls fall quite a little anterior to the angulated periphery, giving the whorls a decidedly constricted appearance at the sutures, which appears decidedly channeled. Periphery of the last whorl decidedly angulated. Base slightly rounded, marked like the spaces between the sutures. Aperture suboval, posterior angle obtuse (outer lip fractured), thick; columella strong, curved, provided with a prominent lamellar plate at its insertion; parietal wall covered by a moderately thick callus.

The specimen described is Clessin's type and was collected by Hilgendorf at Hakodate. It has seven post-nuclear whorls and measures: long. 5 mm.; diam. 2.4 mm. There is a possibility that this may be one of A. Adams's species of *Odostomia*. The description of *Odostomia subangulata* A. Adams reads not unlike this, but absence of measurements, etc., make it impossible to be certain. Clessin's figures, as usual, fail to delineate the characters of this form. No trace of the peripheral angulations is shown.

## ODOSTOMIA (ODOSTOMIA) LIMPIDA, new species.

Plate XXVI, fig. 7.

Shell slender, elongate-conic, semitranslucent, shining. Nuclear whorls moderately large, almost completely obliquely immersed in the first of the succeeding whorls; the peripheral edge only of the last revolution is visible above this. Post-nuclear whorls rather high between the sutures, slightly rounded (almost flattened), faintly shouldered at the summit, apparently without axial or spiral sculpture. The whorls are feebly angulated at the periphery, and the summits of succeeding turns fall a little anterior to it, which renders the sutures well impressed. Base of the last whorl large, rounded, very narrowly umbilicated. Aperture large, subovate, somewhat produced at the junction of the outer lip and columella, posterior angle acute, outer lip thin; columella slender, decidedly curved and somewhat

revolute, provided with a prominent lamellar fold at its insertion; parietal wall covered by a thin callus.

The type belongs to the Pætel collection and is from Japan. It has six post-nuclear whorls and measures: Long., 3.6 mm.; diam., 1.5 mm. It was labeled *Amathis pellucida* A. Adams. This appears to be a *nomen nudum*, as the only reference<sup>a</sup> to that we have been able to find gives the following statement: *Amathis pellucida* A. Adams = *Menestho pellucida* A. Adams.<sup>b</sup> It is very probable that the part of the manuscript relating to the species was omitted. It is not *Voluta* (= *Odostomia*) *pellucida* Dillwyn.<sup>c</sup>

A badly worn shell, perhaps an *Odostomia* s. s., very elongate and umbilicate, bears the name *Amathis concinna* A. Adams, and comes from Japan. *Amathis concinna* appears to be a *nomen nudum* for the reasons cited under *Odostomia* (*Odostomia*) *limpida*.

#### ODOSTOMIA (HEIDA) PANAMENSIS Clessin.

Plate XXVI, fig. 4.

*Odostomia panamensis* CLESSIN, Mart. Chem. Conch. Cab., 2d ed., Pyramid. 1900, p. 120; pl. XXVII, fig. 9.

Shell small, heavy, elongate-ovate, whorls increasing regularly in size, milk white, shining. Nuclear whorls small, almost completely obliquely immersed in the first of the succeeding volutions. Post-nuclear whorls moderately and evenly rounded, of porcellanous texture, without any apparent marking, separated by well marked sutures. Periphery of the last whorl full and rounded. Base inflated, well rounded. Aperture small, decidedly rissoid, almost channeled anteriorly, posterior angle acute; outer lip decidedly curved backward anteriorly, very thick within but beveled to form a sharp edge; columella extremely short, somewhat reflected and connected posteriorly with the very strong parietal callus, which is fully as thick as the edge of the outer lip and connects with it at the posterior angle of the aperture, thus forming a complete peristome. A prominent oblique fold is present on and a little anterior to the insertion of the columella.

There are two specimens of this species in the Berlin collection from Panama. We have considered the best preserved individuals, which evidently served Clessin for his description and figure as his type, and have here rediagnosed and figured it. It has six post-nuclear whorls and measures: Long., 3.1 mm.; diam., 1.5 mm.

Clessin for some unaccountable reason changed the characters of the aperture in the above-cited figure to harmonize with the typical *Odostomia* aperture. He seems to have failed entirely in recognizing the peculiarities of the present species.

<sup>a</sup> Ann. Mag. Nat. Hist., VIII, 1861, p. 304.

<sup>b</sup> Ann. Mag. Nat. Hist., 1860.

<sup>c</sup> Cat. I, 1817, p. 508.

*O. (Heida) panamensis* Clessin represents the first member of this subgenus on the west coast of America; several additional species inhabit the southeast coast.

## GEOGRAPHICAL TABLE.

## AFRICA.

*Turbonilla (Strioturbonilla) securi*, new name.  
*Odostomia (Odostomia) mauritiana*, new species.

## AMERICA.

## ATLANTIC COAST.

*West Indies.*

*Pyramidella (Triptychus) nireus* Mörch.  
*Odostomia (Miralda) jamaicensis* Clessin.

*Mexico.*

*Turbonilla (Chemnitzia) crenulata* Menke.

## PACIFIC COAST.

*Alaska.*

*Odostomia (Eralca) sidkaensis* Clessin.  
*Odostomia (Amaura) martensi*, new name.  
*Odostomia (Amaura) kraussi* Clessin.

*Mexico.*

*Pyramidella (Lougheus) bicolor* Menke.  
*Pyramidella (Pharcidella) hastata* A. Adams.  
*Pyramidella (Pharcidella) molluti*, new name.

*Panama.*

*Odostomia (Heida) panamensis* Clessin.

## AUSTRALIA.

*Pyramidella (Tiberia) pusilla jacksonensis*, new subspecies.

## CHINA.

*Pyramidella (Syrnola) brunnea* A. Adams.

## HAWAII.

*Pyramidella (Cossmannica) aciculata* A. Adams.

## JAPAN.

*Pyramidella (Tiberia) pulchella* A. Adams.  
*Pyramidella (Tiberia) japonica*, new species.  
*Pyramidella (Tiberia) pusilla* A. Adams.  
*Pyramidella (Tiberia) trifasciata* A. Adams.  
*Pyramidella (Tiberia) dunkerri*, new name.  
*Pyramidella (Actwopyramis) erimia* Lischke.  
*Pyramidella (Actwopyramis) fulva* A. Adams.

- Pyramidella (Acteopyramis) casta* A. Adams.  
*Pyramidella (Acteopyramis) lauta* A. Adams.  
*Pyramidella (Acteopyramis) amoena* A. Adams.  
*Pyramidella (Acteopyramis) punctigera* A. Adams.  
*Pyramidella (Acteopyramis) digitalis*, new species.  
*Pyramidella (Styloptygma) serotina* A. Adams.  
*Pyramidella (Syrnola) cinnamomea* A. Adams.  
*Pyramidella (Syrnola) brunea* A. Adams.  
*Pyramidella (Iphiaua) lischkei*, new species.  
*Pyramidella (Iphiaua) tenuisculpta* Lischke.  
*Pyramidella (Agatha) virgo* A. Adams.  
*Turbonilla (Chemnitzia) absida*, new species.  
*Turbonilla (Chemnitzia) dunkeri* Clessin.  
*Turbonilla (Chemnitzia) approximata*, new species.  
*Turbonilla (Chemnitzia) multigrata* Dunker.  
*Turbonilla (Chemnitzia) acosmia*, new species.  
*Turbonilla (Chemnitzia) uctopora*, new species.  
*Turbonilla (Chemnitzia) infantula*, new species.  
*Turbonilla (Strioturbonilla) monocycla* A. Adams.  
*Turbonilla (Pyrgisculus) candidissima*, new name.  
*Turbonilla (Pyrgiscus) mumia* A. Adams.  
*Turbonilla (Cingulina) cingulata* Dunker.  
*Turbonilla (Cingulina) cingulata laticingula*, new subspecies.  
*Turbonilla (Mormula) aulica*, new name.  
*Turbonilla (Mormula) philippiana* Dunker.  
*Turbonilla (Lancella) bella*, new species.  
*Turbonilla (Babella) exaltior*, new name.  
*Odostomia (Trabecula) tantilla* A. Adams.  
*Odostomia (Parthenina) meta*, new species.  
*Odostomia (Chrysalida) dur*, new species.  
*Odostomia (Pyrgulina) lecta*, new species.  
*Odostomia (Pyrgulina) alveata* A. Adams.  
*Odostomia (Egolina) mariella* A. Adams.  
*Odostomia (Miralda) diadema* A. Adams.  
*Odostomia (Miralda) gemma* A. Adams.  
*Odostomia (Miralda)*, species?  
*Odostomia (Menestho) exarantissima*, new species.  
*Odostomia (Odetta) circumata* A. Adams.  
*Odostomia (Odetta) lirata* A. Adams.  
*Odostomia (Odetta) felix*, new species.  
*Odostomia (Odetta) lectissima*, new species.  
*Odostomia (Evalea) culta*, new species.  
*Odostomia (Odostomia) hilyendorfi* Clessin.  
*Odostomia (Odostomia) limpida*, new species.  
*Odostomia (Odostomia) desimana*, new species.  
*Odostomia (Odostomia)*, species?

## SOUTH SEA ISLANDS.

- Pyramidella (Cossmannica) aciculata* A. Adams.  
*Turbonilla (Nisiturris) crystallina*, new species.  
*Turbonilla (Chemnitzia) garrettiana*, new name.  
*Odostomia (Pyrgulina) amanda* Garrett.  
*Odostomia (Pyrgulina) densecostata* Garrett.  
*Odostomia (Pyrgulina) densecostata upoluensis*, new subspecies.

## EXPLANATION OF PLATES.

The measurements cited after the name refer to the axial length of the specimen.

## PLATE XVII.

- FIG. 1. *Turbonilla* (*Pyrgiscus*) *munia* A. Adams; 3.3 mm.; p. 343.  
 2. *Odostomia* (*Miralda*) *diadema* A. Adams; 2.3 mm.; p. 356.  
 3. *Turbonilla* (*Pyrgisculus*) *candidissima*, new name; 6.7 mm.; p. 342.  
 4. *Odostomia* (*Chrysallida*) *dur*, new species; type; 1.8 mm.; p. 350.  
 5. *Pyramidella* (*Styloptygma*) *serotina* A. Adams; 3 mm.; p. 334.  
 6. *Odostomia* (*Miralda* ?) *jamaicensis* Clessin; type; 2.1 mm.; p. 355.  
 7. *Turbonilla* (*Nisitarris*) *crystallina*, new species; type; 4.5 mm.; p. 341.  
 8. *Odostomia* (*Erutea*) *silkensis* Clessin; type; 4 mm.; p. 360.  
 9. *Turbonilla* (*Babella*) *cabulior*, new name; 4.4 mm.; p. 347.

## PLATE XVIII.

- FIG. 1. *Odostomia* (*Pyrgulina*) *densecostata upoluensis*, new subspecies; type; 3.7 mm.; p. 351.  
 2. *Pyramidella* (*Agatha*) *virgo* A. Adams; 13.7 mm.; p. 335.  
 3. *Odostomia* (*Pyrgulina*) *amauda* Garrett; type; 3 mm.; p. 353.  
 4. *Odostomia* (*Pyrgulina*) *densecostata* Garrett; type; 4 mm.; p. 350.  
 5. *Turbonilla* (*Mormula*) *philippiana* Dunker; 5.3 mm.; p. 345.

## PLATE XIX.

- FIG. 1. *Pyramidella* (*Acteopyramis*) *amena* A. Adams; 7 mm.; p. 330.  
 2. *Pyramidella* (*Acteopyramis*) *punctigera* A. Adams; 5.4 mm.; p. 331.  
 3. *Odostomia* (*Menestho*) *exaratisima*, new name; 4.8 mm.; p. 357.  
 4. *Pyramidella* (*Acteopyramis*) *casta* A. Adams; 11.3 mm.; p. 329.  
 5. *Pyramidella* (*Acteopyramis*) *lauta* A. Adams; 7 mm.; p. 329.  
 6. *Pyramidella* (*Acteopyramis*) *digitalis*, new species; type; 2.2 mm.; p. 331.  
 7. *Odostomia* (*Menestho*) *exaratisima*, new name; 4.2 mm.; p. 357.

## PLATE XX.

- FIG. 1. *Turbonilla* (*Chemnitzia*) *approximata*, new species; type; 8.2 mm.; p. 337.  
 2. *Turbonilla* (*Chemnitzia*) *infantula*, new species; type; 2.1 mm.; p. 338.  
 3. *Turbonilla* (*Chemnitzia*) *dunkeri* Clessin; type; 6.2 mm.; p. 336.  
 4. *Turbonilla* (*Chemnitzia*) *multigrata* Dunker; type; 11.5 mm.; p. 335.  
 5. *Turbonilla* (*Chemnitzia*) *acosmia*, new species; type; 8.4 mm.; p. 339.  
 6. *Turbonilla* (*Chemnitzia*) *actopora*, new species; type; 6.8 mm.; p. 338.

## PLATE XXI.

- FIG. 1. *Turbonilla* (*Cingulina*) *cingulata* Dunker; type; 7.4 mm.; p. 344.  
 2. *Odostomia* (*Oleta*) *felix*, new species; type; 2.6 mm.; p. 358.  
 3. *Turbonilla* (*Cingulina*) *cingulata laticingula*, new subspecies; type; 4 mm.; p. 344.  
 4. *Turbonilla* (*Chemnitzia*) *abscida*, new species; type; 8.4 mm.; p. 337.  
 5. *Turbonilla* (*Chemnitzia*) *garrettiana*, new name; type; 7.4 mm.; p. 339.  
 6. *Turbonilla* (*Chemnitzia*) *crenulata* Menke; type; 8.6 mm.; p. 340.



## PLATE XXII.

- FIG. 1. *Odostomia* (*Miralda*) *gemma* A. Adams; 3.2 mm.; p. 356.  
 2. *Odostomia* (*Pyrgulina*) *lecta*, new species; type; 3.4 mm.; p. 352.  
 3. *Odostomia* (*Trabecula*) *tantilla* A. Adams; 2.6 mm.; p. 348.  
 4. *Odostomia* (*Egilina*) *mariella* A. Adams; 1.8 mm.; p. 354.  
 5. *Odostomia* (*Pyrgulina*) *alveata* A. Adams; 2 mm.; p. 351.  
 6. *Turbonilla* (*Lancella*) *bella*, new species; type; 7.5 mm.; p. 346.  
 7. *Turbonilla* (*Mormula*) *aulica*, new name; type; 9.6 mm.; p. 345.  
 8. *Turbonilla* (*Strioturbonilla*) *monocycla* A. Adams; 4.3 mm.; p. 342.

## PLATE XXIII.

- FIG. 1. *Pyramidella* (*Acteopyramis*) *eximia* Lischke; cotype?; 18.1 mm.; p. 327.  
 2. *Odostomia* (*Amaura*) *krausei* Clessin; type; 9.9 mm.; p. 362.  
 3. *Odostomia* (*Odetta*) *lectissima*, new species; type; 1.7 mm.; p. 358.  
 4. *Pyramidella* (*Acteopyramis*) *fulva* A. Adams; 20.3 mm.; p. 328.  
 5. *Odostomia* (*Parthenina*) *meta*, new species; type; 2.1 mm.; p. 349.  
 6. *Odostomia* (*Odetta*) *circinata* A. Adams; 2.1 mm.; p. 359.

## PLATE XXIV.

- FIG. 1. *Pyramidella* (*Cossmannica*) *aciculata* A. Adams; 14.2 mm.; p. 326.  
 2. *Pyramidella* (*Tiberia*) *japonica*, new species; type; 6.1 mm.; p. 324.  
 3. *Turbonilla* (*Nisiturris*) *crystallina*, new species, nucleus much enlarged; p. 341.  
 4. *Pyramidella* (*Syrnola*) *brunnea* A. Adams; 17.6 mm.; p. 332.  
 5. *Odostomia* (*Odostomia*) *hilgendorfi* Clessin; type; 5 mm.; p. 364.  
 6. *Pyramidella* (*Tiberia*) *pusilla* A. Adams; 6.4 mm.; p. 324.  
 7. *Pyramidella* (*Syrnola*) *brunnea* A. Adams; a portion much enlarged to show spiral sculpture; p. 332.  
 8. *Pyramidella* (*Cossmannica*) *aciculata* A. Adams; a portion much enlarged to show spiral sculpture; p. 326.

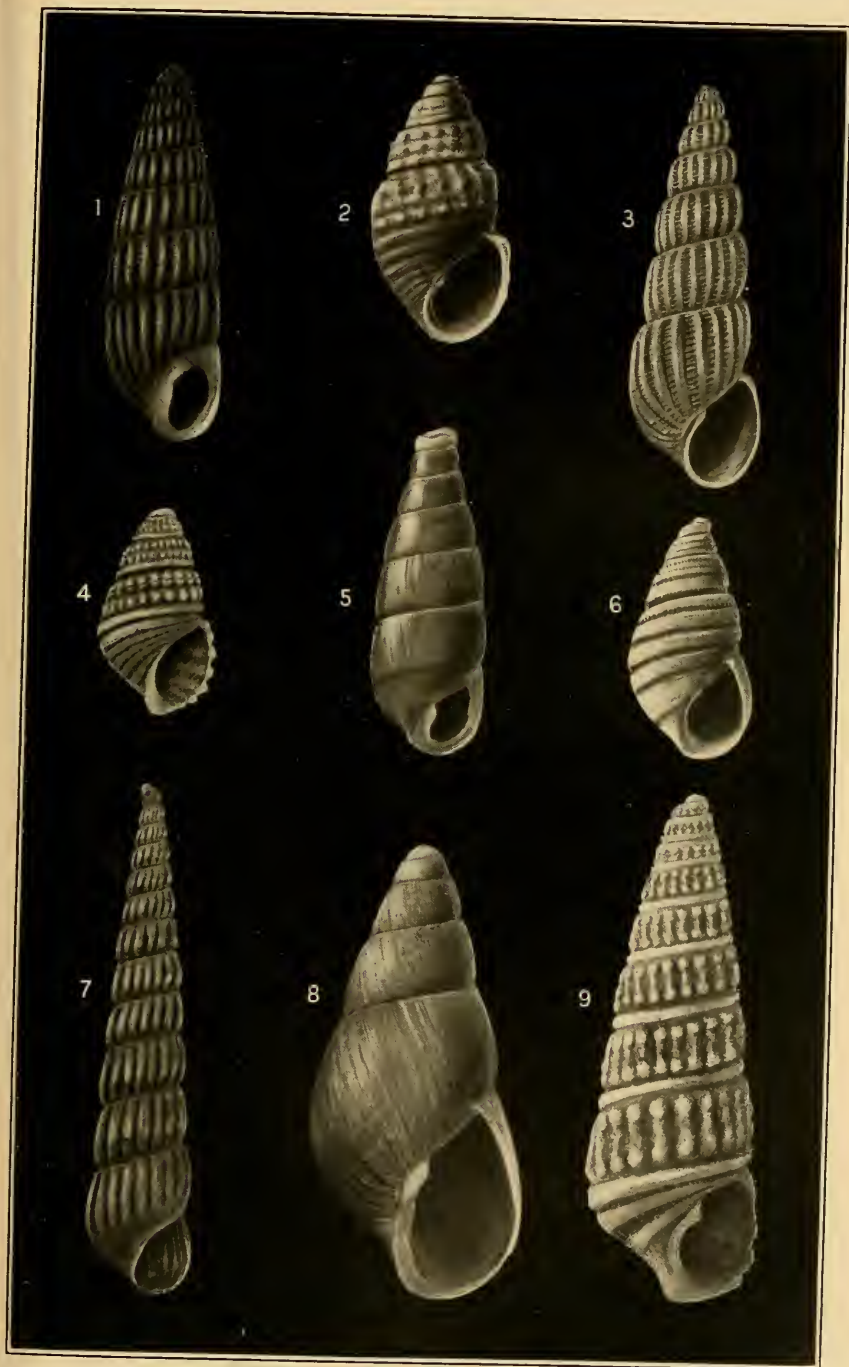
## PLATE XXV.

- FIG. 1. *Pyramidella* (*Iphiaua*) *lischkei*, new species; type; 4.6 mm.; p. 333.  
 2. *Pyramidella* (*Tiberia*) *dukeri*, new name; type; 5 mm.; p. 326.  
 3. *Odostomia* (*Odostomia*) *desimana*, new name; 6.7 mm.; p. 362.  
 4. *Pyramidella* (*Tiberia*) *pulchella* A. Adams; 12.2 mm.; p. 323.  
 5. *Odostomia* (*Amaura*) *martensi*, new name; type; 5.3 mm.; p. 361.  
 6. *Pyramidella* (*Tiberia*) *trifasciata* A. Adams; 6 mm.; p. 325.

## PLATE XXVI.

- FIG. 1. *Pyramidella* (*Syrnola*) *cinnamomea* A. Adams; 4.2 mm.; p. 332.  
 2. *Odostomia* (*Odostomia*) *desimana*, new name; type; 5.3 mm.; p. 362.  
 3. *Pyramidella* (*Iphiaua*) *tenuisculpta* Lischke; 10.4 mm.; p. 334.  
 4. *Odostomia* (*Heida*) *panamensis* Clessin; type; 3.1 mm.; p. 365.  
 5. *Pyramidella* (*Iphiaua*) *tenuisculpta* Lischke; a portion much enlarged to show spiral sculpture; p. 334.  
 6. *Odostomia* (*Odostomia*) *mauritanica*, new species; type; 2.1 mm.; p. 363.  
 7. *Odostomia* (*Odostomia*) *limpida*, new species; type; 3.6 mm.; p. 364.  
 8. *Pyramidella* (*Tiberia*) *pusilla jacksonensis*, new subspecies; type; 6.1 mm.; p. 325.  
 9. *Odostomia* (*Eralea*) *culta*, new species; type; 4 mm.; p. 361.

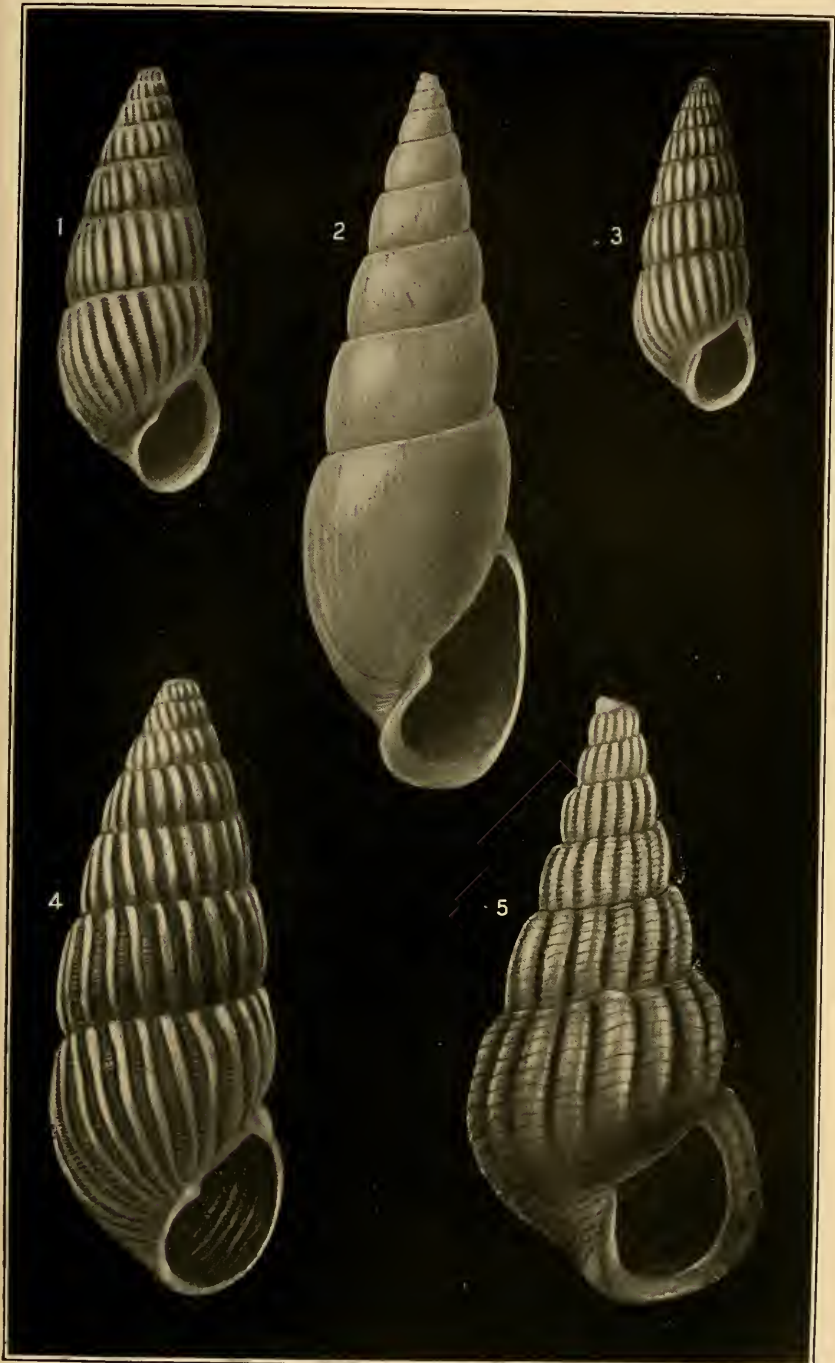




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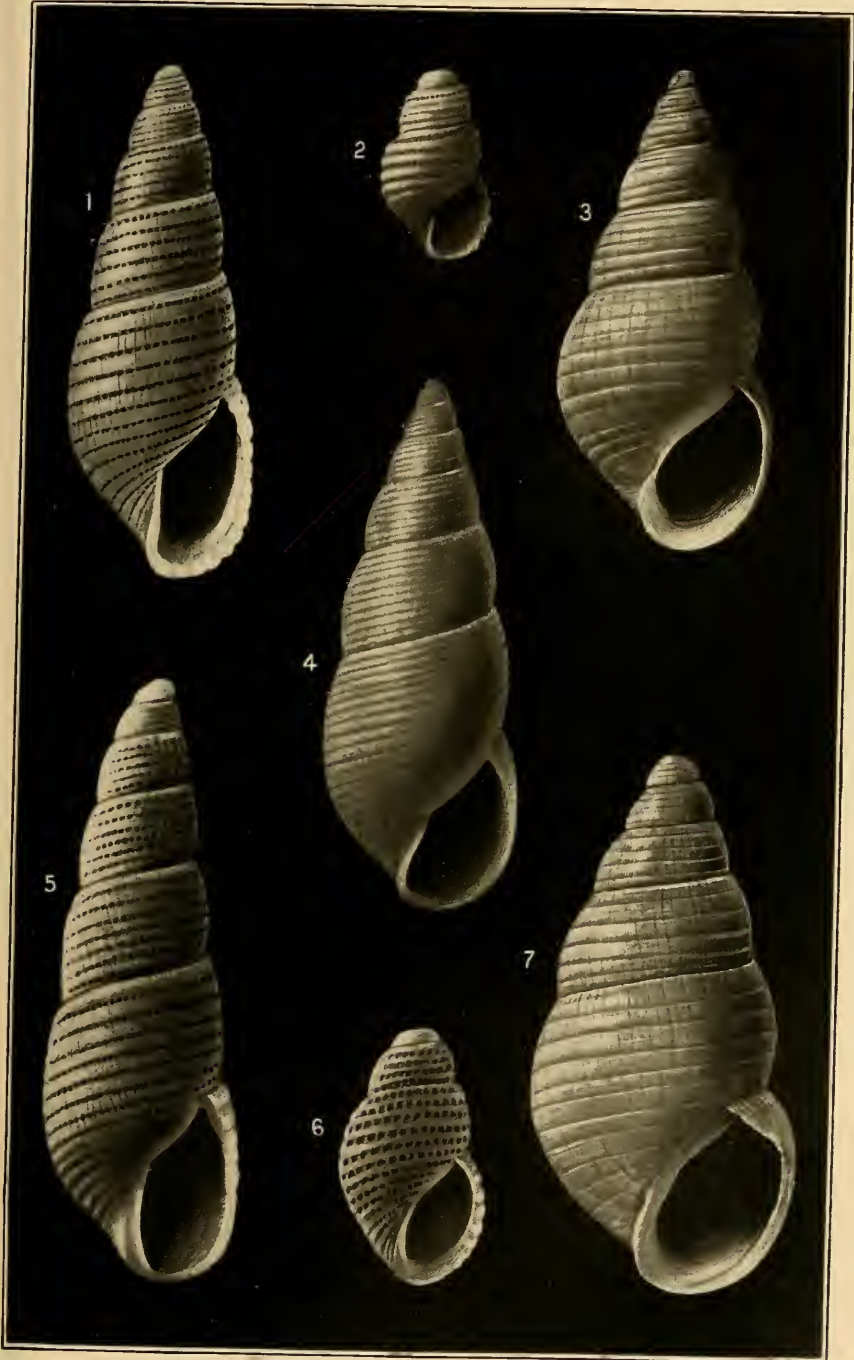




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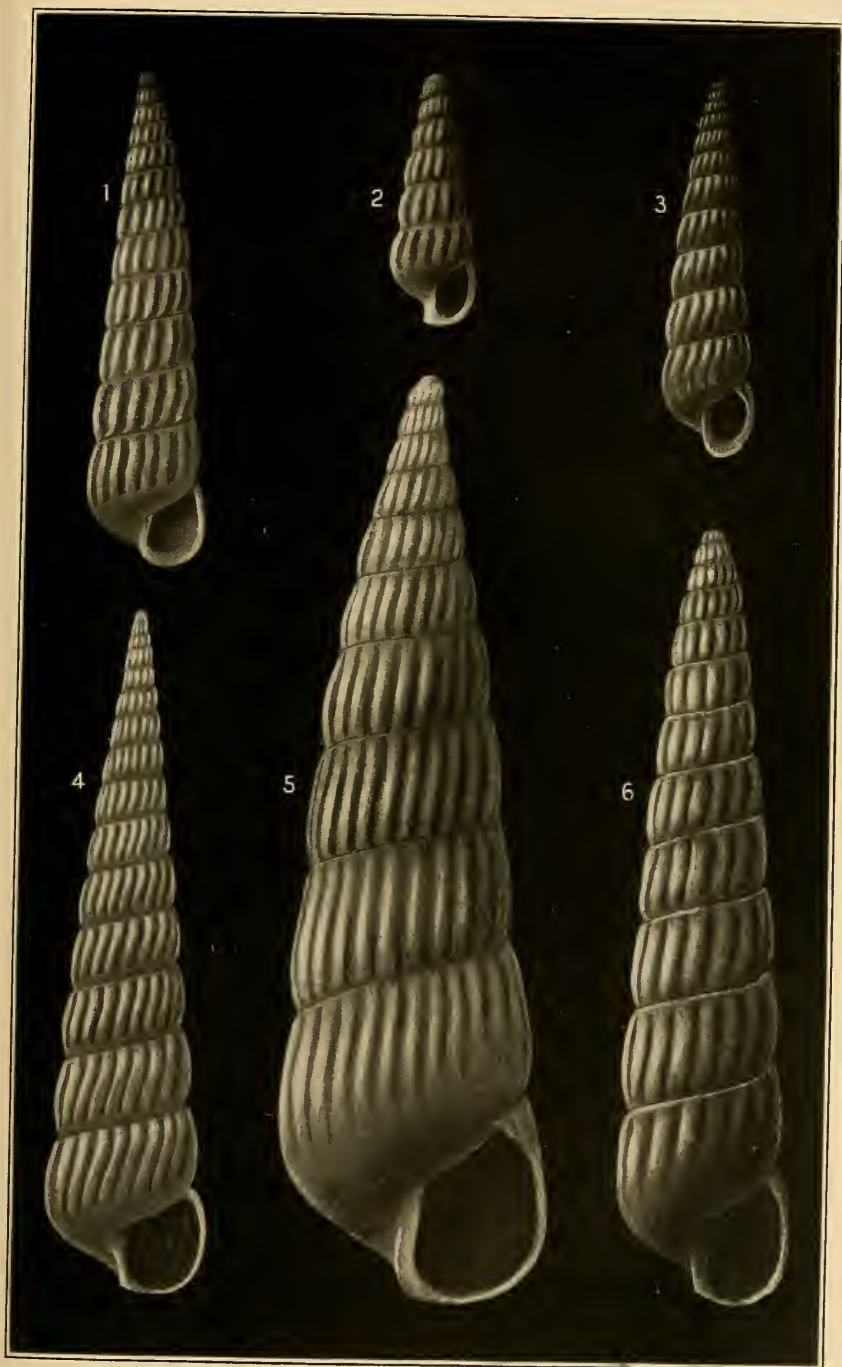


MOLLUSKS OF THE FAMILY PYRAMIDELLIDÆ.

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MOLLUSKS OF THE FAMILY PYRAMIDELLIDÆ.

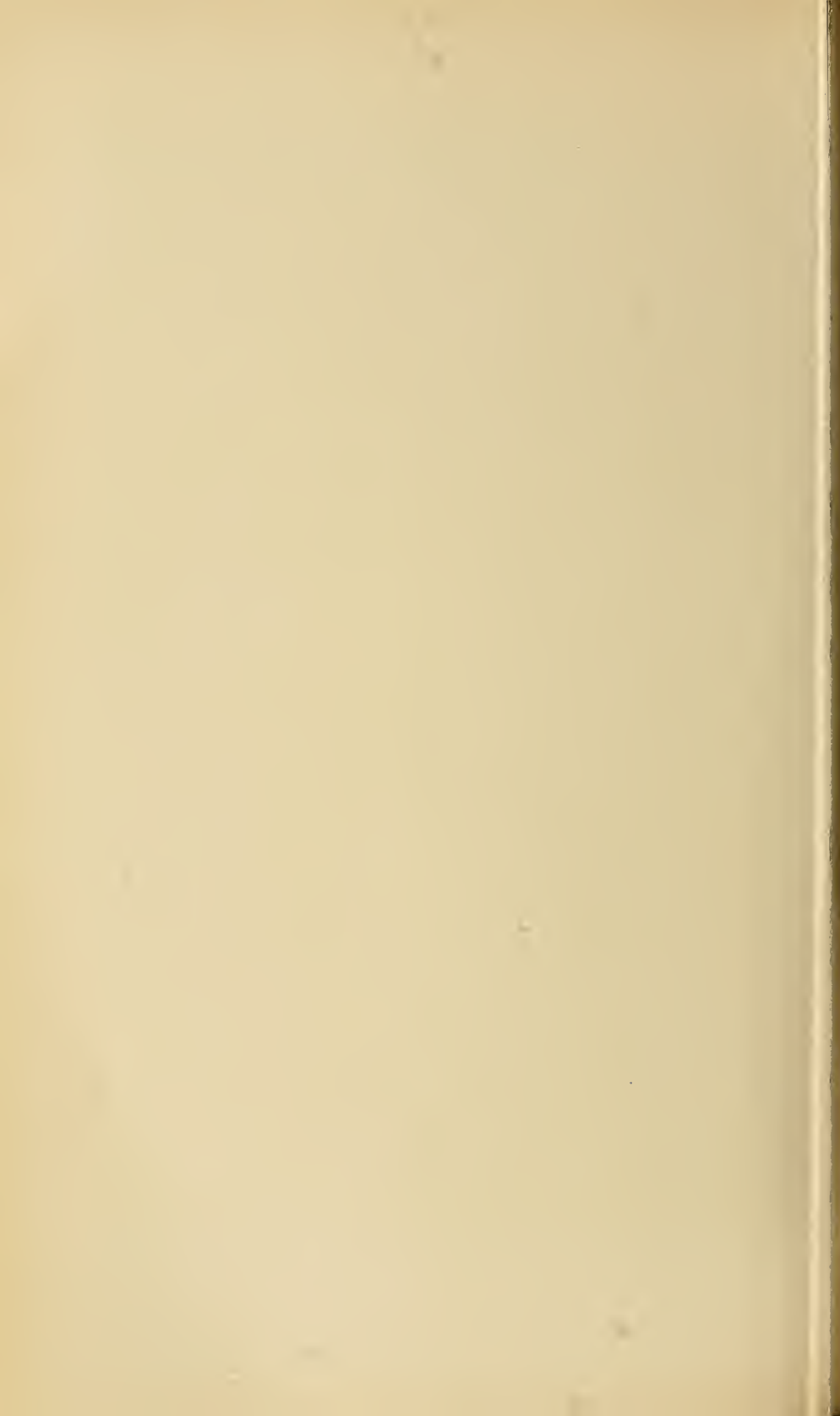
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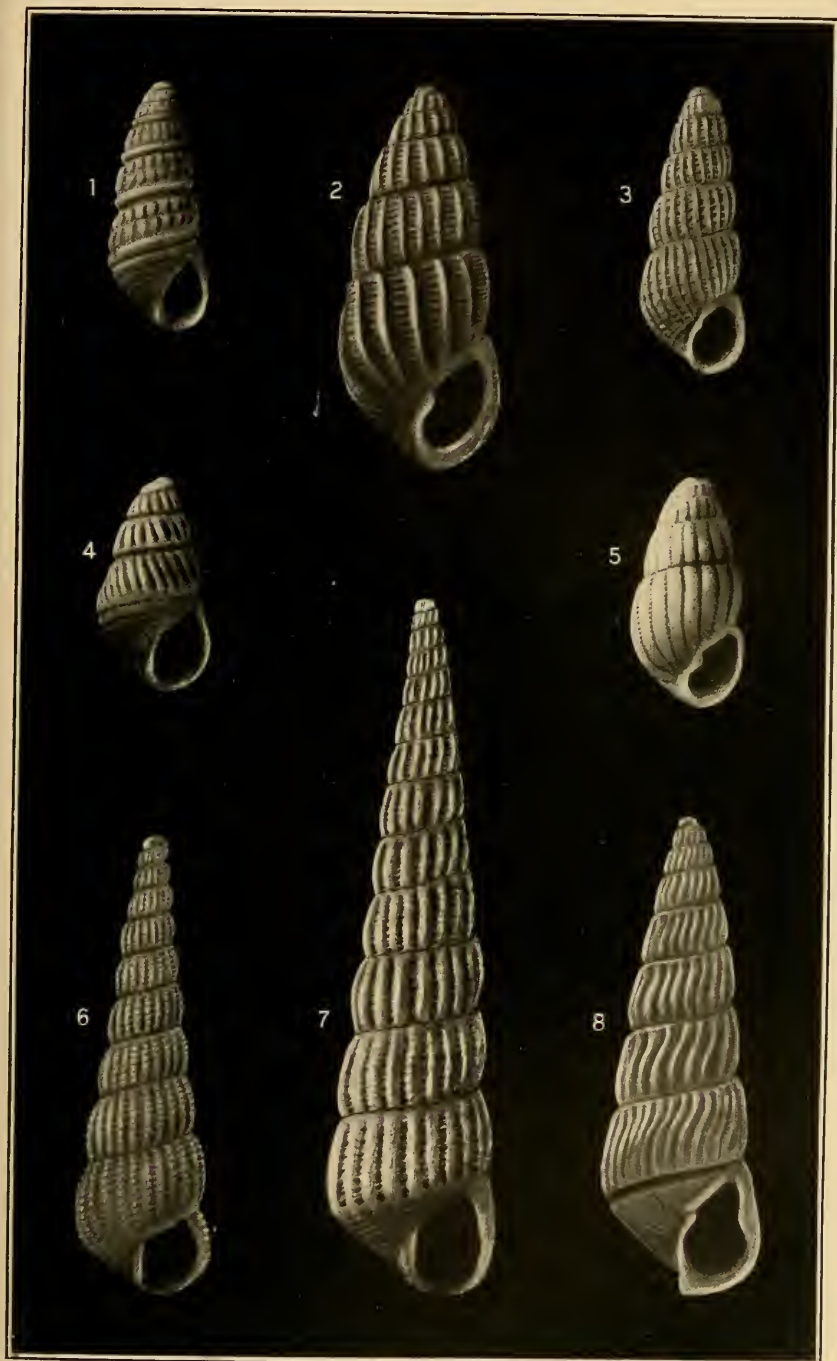




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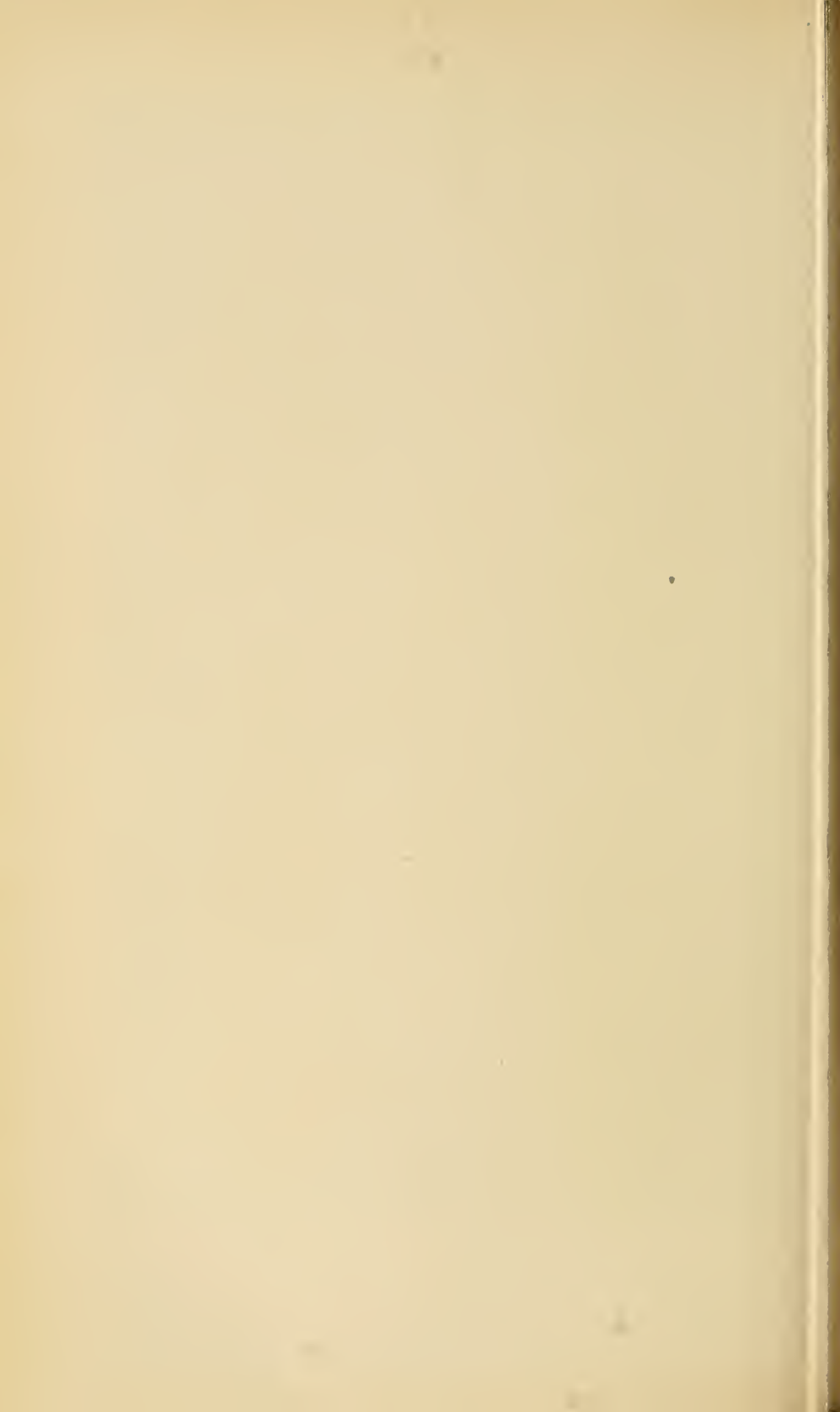
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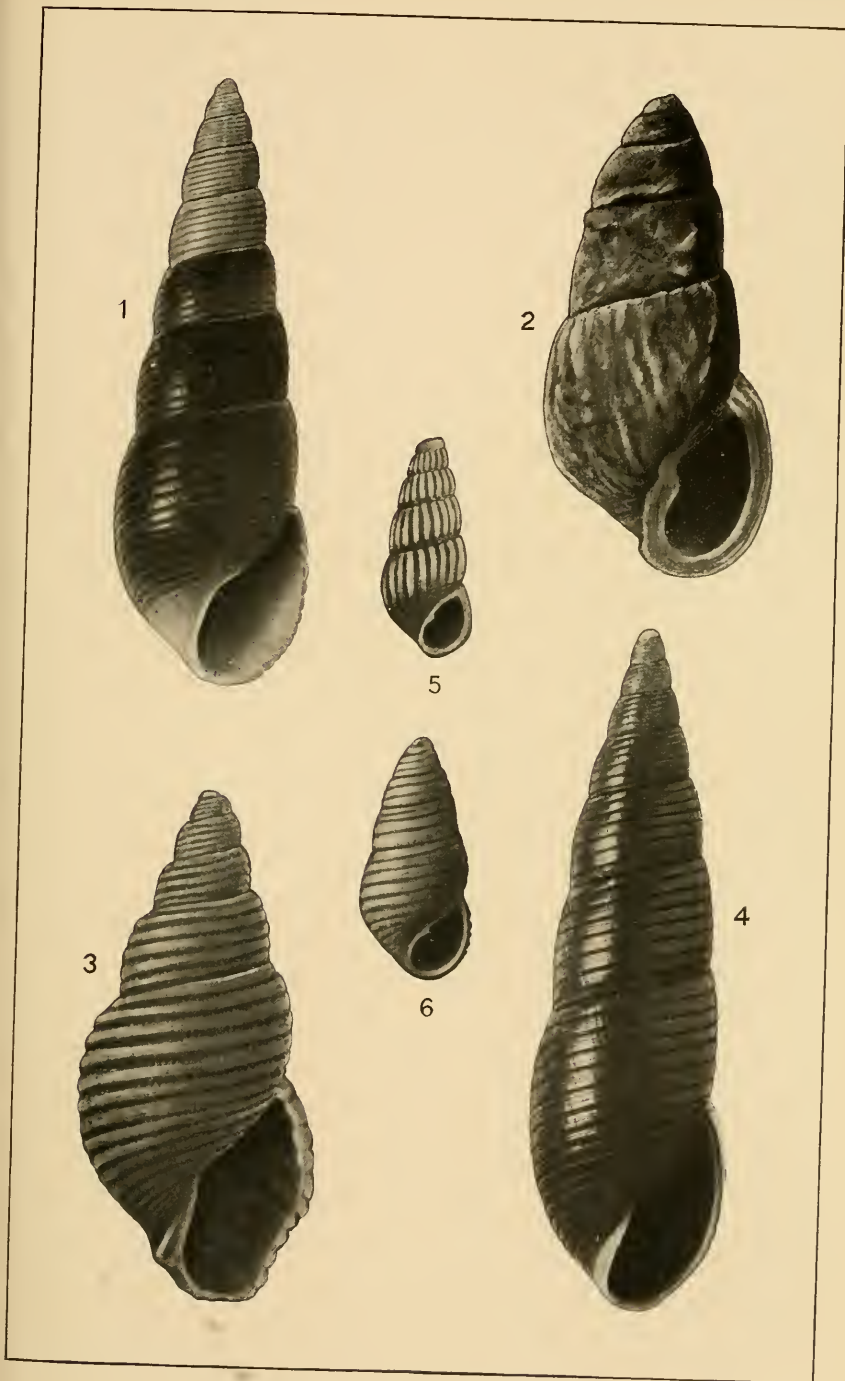




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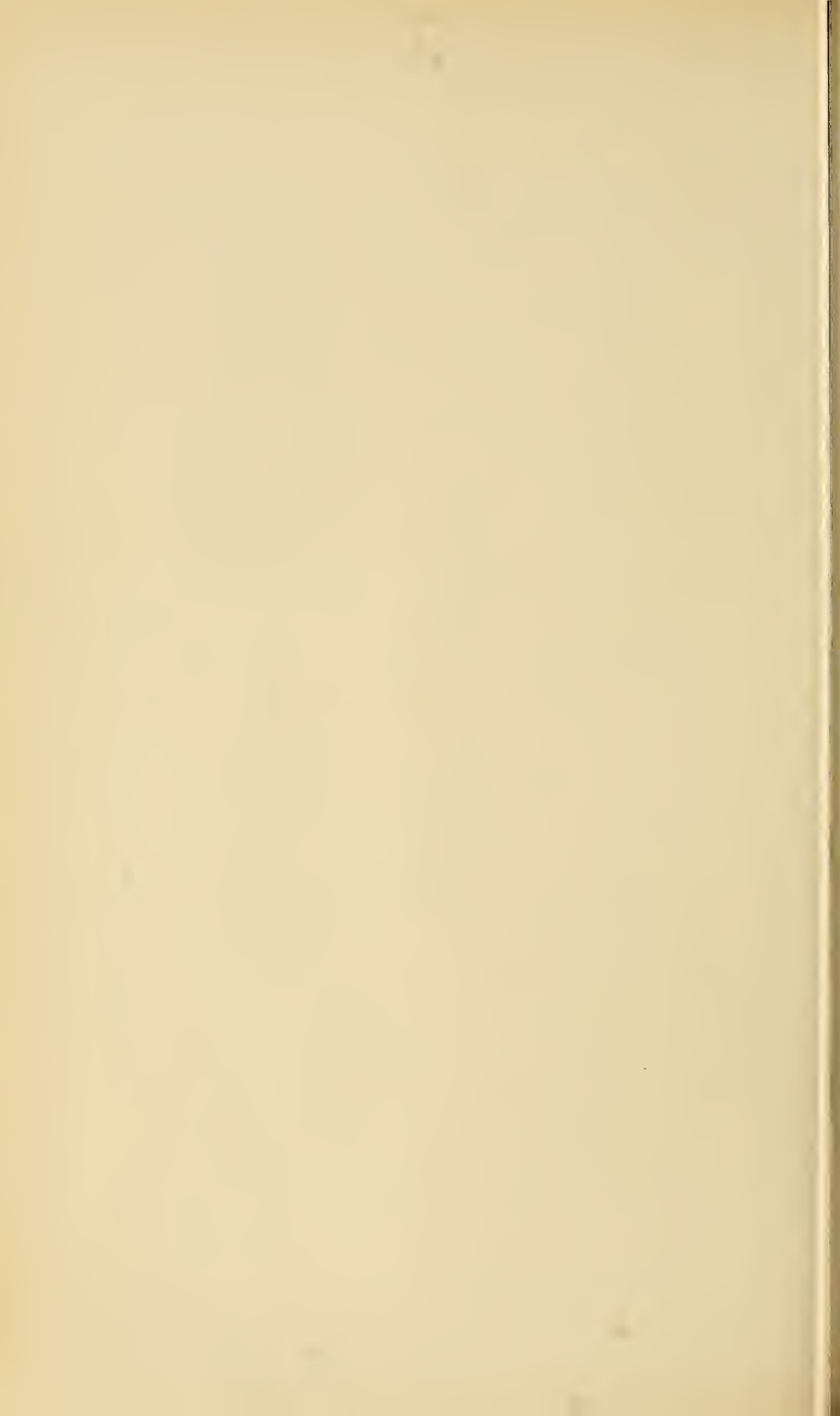
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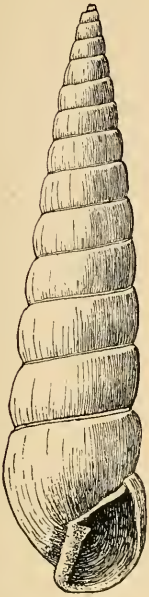


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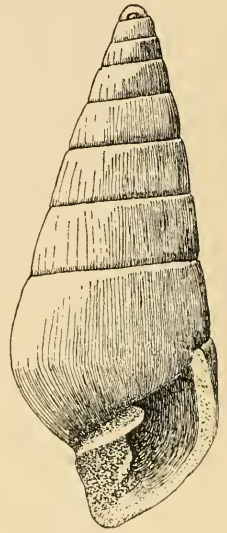




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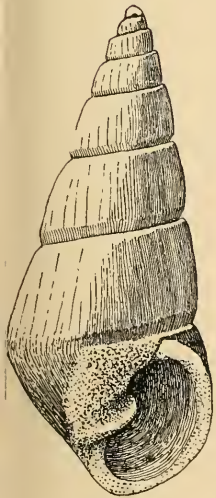
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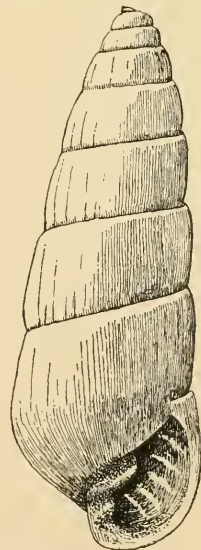
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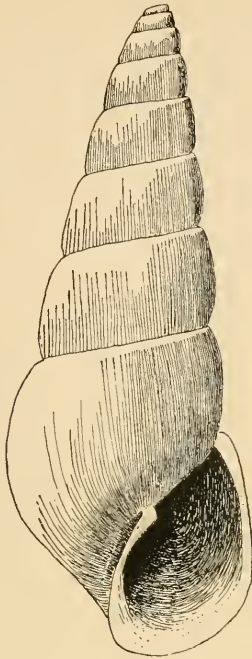
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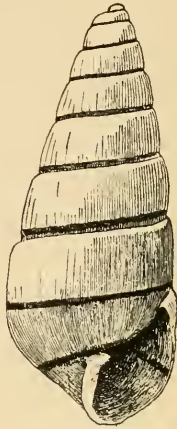




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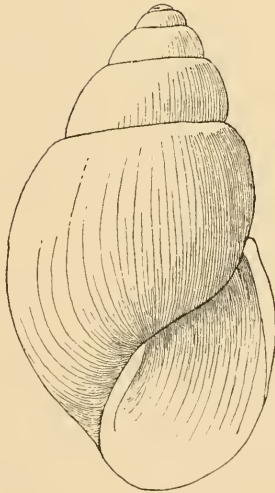
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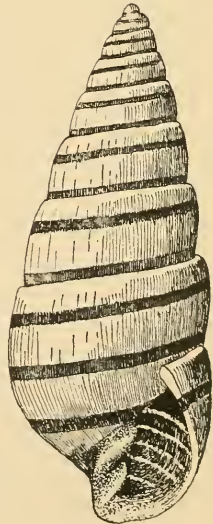
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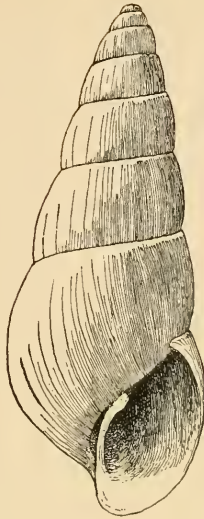
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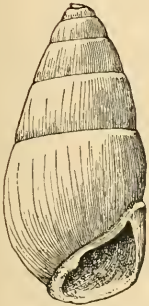
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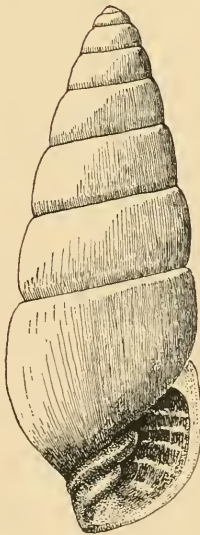
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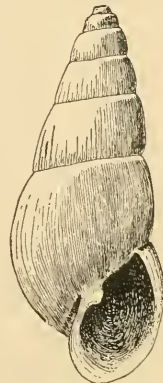
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FOR EXPLANATION OF PLATE SEE PAGE 369.

