

ADDITIONS TO THE WEST AMERICAN PYRAMIDELLID
MOLLUSK FAUNA, WITH DESCRIPTIONS OF NEW SPECIES.¹

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INTRODUCTION.

The publication of the monograph on the West American Pyramidellid Mollusks in 1909, as Bulletin 68 of the United States National Museum, appears to have stimulated the workers in mollusks to further efforts in this field, for there soon followed many requests from west coast collectors for the examination of their collections and the identification of their material. This has been cheerfully done and has resulted in the addition of much new material, as well as an increased knowledge of the distribution of the species previously described. The data pertaining to the distribution of the West American Pyramidellidæ will be shortly presented for publication in a separate paper. The present paper will be confined to the presentation of the additions made since Bulletin 68 was issued, and to certain corrections of errors, mostly in citation, which have been discovered in that work.

In this connection I wish to express my thanks to all the correspondents who have sent their material to me for examination, which has made this increase of the knowledge of this group possible, and I wish to especially thank Mr. John C. Macoun, of the Geological Survey of Canada, who was kind enough to send us the shells dredged in Barkley Sound, Vancouver Island, British Columbia, which were reported upon by Dr. W. H. Dall and the present writer in Memoir No. 14 of the Department of Mines of the Geological Survey of Canada. A report on a second sending from the same general locality is now going through press. The labors of Dr. Fred Baker, Miss J. M. Cooke, Prof. F. W. Kelsey, and Mr. C. W. Gripp have added materially to our knowledge of the fauna of the San Diego region;

¹ A supplement to the monograph on this group published as Bulletin 68 of the United States National Museum December 13, 1909.

of Mr. and Mrs. T. S. Oldroyd and Mrs. B. L. Baldrige to that of San Pedro, California; and of Mr. S. S. Berry to that of the vicinity of Monterey, California. I wish also to express my sincere thanks to Mr. Tom Iredale for calling attention to certain bibliographical and other errors occurring in Bulletin 68, which are corrected in the present paper.

The accompanying drawings were made by Miss Evelyn G. Mitchell.

When the monograph was prepared several publications were not available for consultation, among them the Synopsis of the British Museum for 1840 and 1842, which made it necessary to use secondary quotations, and has led to some slight errors. Another work, by De Folin, *D'une Methode de Classification pour les Coquilles de la famille des Chemnitzidæ*,¹ had escaped our attention altogether and has only recently been made known to us by Mr. Tom Iredale.² We have been unable to find it in Washington so far, but take Mr. Iredale's assurance in the places cited that the paper we quoted as "*Constit. Method. de la Fam. Chemnitzidæ, 1885*," reprints the tabular classification without change. Although this makes quite a change necessary in the references to De Folin's names, it fortunately entails no change in the nomenclature in use. This second paper of De Folin we had seen in separate form only, and we are told by Iredale that it was published in 1884-85.³

The following notes will bring the bulletin up to date:

Page 8, line 22: Scacchi should read Brocchi.

Page 10: Drop the footnote and cite the subgenus as follows: *Agatha* A. Adams, *Ann. Mag. Nat. Hist.*, ser. 3, vol. 6, 1860, p. 422. Type, *Agatha virgo* A. Adams. This was a monotypic genus at the time of description, and although the type was subsequently assigned to *Myonia*, *Menestho*, and *Amathis* by A. Adams, must remain as the type of the present group, which is valid.

Page 11, line 22: *plicata* should read *plicatula*.

Pages 13 and 18: The subgenera *Elodiamea* De Folin and *Odos-tomiella* Bucquoy, Dautzenberg, and Dollfus should be united, the complete synonymy reading:

Odostomella Bucquoy, Dautzenberg, and Dollfus, *Moll. Roussillon*, 1883, p. 167, type, *Rissoa doliolum* Philippi, + *Elodia* De Folin, *Ann. Soc. Linn. Maine et Loire*, vol. 12, 1870, p. 200, = *Elodiamea* De Folin, *Zool. Rec.*, 1885, published in 1886, p. 94, not *Elodia* Desvoidy, 1863 + *Herviera* Melvill and Standen, *Journ. Conch.*, vol. 9, 1899.

Page 16, line 39: *gradata* should read *graduata*.

Page 17, line 22: 1853 should read 1833.

¹ *Ann. Soc. Linn. Maine et Loire*, vol. 12, pp. 191 et seq.

² *Nautilus*, vol. 24, 1910, pp. 55-6.

³ *Ann. Soc. Agr. et Hist. Nat. Lyons*, vol. 7, pp. 209 et seq.

Page 17, line 12 *et seq.*: *Eulimella* should be cited as follows: *Eulimella* Forbes in Jeffreys, Ann. Mag. Nat. Hist., vol. 19, p. 311, April, 1847, type, *E. macandræi* Forbes = *Eulima scillæ* Scacchi.

Page 17, line 12: The date of Cossmann's paper containing the description of *Loxoptyxis* has been questioned. The separates of this paper appear to have been distributed July, 1888, while the completed vol. 23 of the Ann. Soc. Roy. Malac. Belg. may have appeared later.

Page 17, line 15: Cossmann should read Deshayes.

Page 17, line 20: Our citation for *Monotygmia* Gray was taken from Fischer, Man. de Conch., 1885, p. 787. No change in the nomenclature is necessary, although Gray's names published in the Synopsis of the British Museum for 1840 or 1842 are stated to be nude names.

Page 17, line 37: The reference to *Oscilla* A. Adams should be changed to read as follows:

Oscilla A. Adams, Ann. Mag. Nat. Hist., ser. 3, vol. 7, 1861, p. 296. Type, *Monotygmia cingulata* A. Adams. It remains a synonym of *Cingulina* A. Adams. The spirally lirated *Odostomias* belong to the subgenus *Menestho* Möller.

Page 18, line 20: p. 59 should read p. 8.

Page 18, line 27, should read Trans. Roy. Soc. South Australia, vol. 24, 1900, p. 98.

Page 18, line 30: 1879 should read 1899.

Page 29, lines 3 and 14: *plicata* should read *plicatula*.

Page 29, line 15: *plicatus* should read *plicatulus*.

Page 134: The citation for *Salassia* should be as follows: *Salassia* De Folin, Ann. Soc. Linn. Maine et Loire, vol. 12, 1870, p. 200. Type, *Salassia carinata* De Folin (= *Odostomia* (*Salassia*) *tropidita* Dall and Bartsch.)

De Folin's tabular classification cited above and also his Constitution Méthodique, Famille des Chemnitzidæ, published in the Ann. Soc. Agri. et Hist. Nat. Lyons, vol. 7, 1884-85, pp. 209, etc., which is a duplication of the former, gives no reference to type species. In his Fonds de la Mer, vol. 1, 1870, p. 314, the nude name *Salassia carinata* occurs, which is the first species that he describes later on, Fonds de la Mer, vol. 2, 1872, p. 168, pl. 6, fig. 6. This was, therefore, accepted as type of *Salassia*.

Page 136: *Noemia* De Folin, a synonym of *Chrysallida* Carpenter, must now be cited as follows: *Noemia* De Folin, Ann. Soc. Linn. Maine et Loire, vol. 12, 1870, p. 200.

Page 184: The reference to *Jaminea* De Folin, a synonym of *Menestho*, should read *Jaminea* De Folin, Fonds de la Mer, vol. 1, 1869, p. 214. Type, *Jaminea bilirata* De Folin. Drop from the synonymic reference of *Menestho*, "+ *Jaminina* De Folin, Zool. Record, vol. 22, 1885, p. 94."

DESCRIPTIONS OF SPECIES.

TURBONILLA (CHEMNITZIA) CLARINDA, new species.

Plate 35, fig. 4, 4a.

Shell elongate-conic, bluish-white, semitranslucent. Nuclear whorls $2\frac{1}{2}$, forming a rather solute, elevated, helicoid spire, whose axis is at right angles to the succeeding turns, in the first of which it is slightly immersed. Post-nuclear whorls well rounded, appressed at the summit, marked by very regular, rounded, slightly protractive, axial ribs, of which 16 occur upon the first to seventh, 18 upon the eighth and the penultimate turn. These ribs become slightly flattened and somewhat expanded at the summit. Intercostal spaces a little wider than the ribs, well impressed, terminating a little posterior to the suture, thus leaving a plain, narrow band immediately above the suture. Sutures somewhat constricted. Periphery and base of the last whorl well rounded, smooth. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip slender, slightly sinuous, and very slightly revolute.

The type and 2 additional specimens are listed as Cat. No. 211546, U.S.N.M. These and 5 other specimens, in Mr. Kelsey's collection, were dredged in 12 to 30 fathoms in San Diego Bay, California. The type has 10 post-nuclear whorls and measures: Length, 4.7 mm.; diameter, 1.1 mm.

This species follows *Turbonilla (Chemnitzia) santarosana* in the key.

TURBONILLA (STRIOTURBONILLA) DINORA, new species.

Plate 35, fig. 8.

Shell very elongate-conic, milk-white. Nuclear whorls small, at least 2, about one-third immersed in the first of the succeeding turns. Post-nuclear whorls slightly rounded, narrowly shouldered at the summit, marked by very strong, very regular, broad, rounded, slightly curved, decidedly protractive, axial ribs, of which 14 occur upon the first to seventh whorl, 16 upon the eighth and ninth, 18 upon the tenth and the penultimate turn. Intercostal spaces very strongly impressed, as wide as the ribs, terminating a little anterior to the suture. Periphery of the last whorl well rounded; base short, well rounded, marked by lines of growth and numerous, exceedingly fine, spiral striations; the latter also cross the ribs and intercostal spaces on the spire. Sutures strongly constricted. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip short, somewhat curved and revolute, without apparent fold; parietal wall glazed with a thin callus.

The unique type of this species (Cat. No. 211553, U.S.N.M.) was collected by Miss J. M. Cooke on the sandspit in San Diego Bay, Cali-

fornia. It has 12 post-nuclear whorls and measures: Length, 9.2 mm.; diameter, 2.2 mm.

This species is nearest related to the *Turbonilla* (*Strioturbonilla*) *stearnsi*, a fossil species from San Diego, California, and follows *Turbonilla* (*Strioturbonilla*) *stephanogyra* in the key.

TURBONILLA (STRIOTURBONILLA) ENCELLA, new species.

Plate 35, fig. 1, 1a.

Shell small, elongate-conic, bluish-white. Nuclear whorls decolated. Post-nuclear whorls well rounded, slightly shouldered at the summit, crossed by broad, low, decidedly protractive, axial ribs, which become slightly flattened at the summit. Of these ribs, 14 occur upon the second of the remaining turns, 16 upon the third to seventh, and 20 upon the penultimate turn. Intercostal spaces a little wider than the ribs, the impressed portion terminating at a little distance posterior to the suture, leaving a narrow, plain band just above this. Suture well marked. Periphery of the last whorl and the moderately long base well rounded, the latter marked by the feeble continuations of the axial ribs, which extend to the umbilical area. Entire surface of spire and base marked by numerous, strong, rather coarse, wavy, spiral striations, which on the spire extend equally strong over the ribs and intercostal spaces. Aperture subquadrate; posterior angle obtuse; outer lip (fractured) thin; inner lip moderately strong, somewhat curved, and reflected.

The unique type of this species (Cat. No. 211547, U.S.N.M.) comes from San Pedro, California. It has 9 post-nuclear whorls remaining, having lost the nucleus and probably the first 2 post-nuclear turns, and measures: Length, 4.5 mm.; diameter, 1.2 mm.

This species recalls *Turbonilla* (*Strioturbonilla*) *stearnsi*, which occurs fossil at San Pedro. It differs from it in being much smaller and in having much stronger spiral sculpture. It follows *Turbonilla* (*Strioturbonilla*) *attrita* in the key.

TURBONILLA (STRIOTURBONILLA) BAKERI, new species.

Plate 35, figs. 10, 10a.

Shell elongate-conic, bluish-white. Nuclear whorls small, $2\frac{1}{2}$, forming a quite elevated, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls slightly rounded, narrowly shouldered at the summit, somewhat constricted at the suture, marked by very regular, strong, rounded, slightly protractive, axial ribs, which become somewhat expanded at the summit. Of these ribs, 14 occur upon the first four turns, 16 upon the fifth to tenth, 18 upon the eleventh, and 20 upon the penultimate turn. Intercostal spaces strongly impressed, almost as wide as the ribs, terminating shortly

before reaching the suture, thus leaving a narrow plain band immediately above the suture. Sutures well impressed. Periphery of the last whorl and short base well rounded, smooth, except for fine incremental lines and the numerous, exceedingly fine, closely-spaced, wavy, spiral striations which cover the entire surface of the shell. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip almost straight, slightly revolute; parietal wall glazed with a thin callus.

The type (Cat. No. 211549, U.S.N.M.) has 13 post-nuclear whorls and measures: Length, 8 mm.; diameter, 1.8 mm. It and another specimen, which is in Dr. F. C. Baker's collection, came from San Diego Bay, California.

This species follows *Turbonilla (Strioturbonilla) nicholsi* in the key.

TURBONILLA (STRIOTURBONILLA) DRACONA, new species.

Plate 35, figs. 2, 2a.

Shell very elongate-conic, bluish-white. Nuclear whorls small, 2, helicoid, having their axes at right angles to that of the succeeding turns. Post-nuclear whorls well rounded, somewhat shouldered at the summit, marked by strong, somewhat curved, decidedly protractive, axial ribs, which extend undiminished from the summit to the periphery, between the sutures, while on the last whorl they continue feebly over the base. Of these ribs, 14 occur upon the first, 16 upon the second, 18 upon the third to eighth, 20 upon the ninth and tenth, and 22 upon the penultimate turn. Intercostal spaces about $1\frac{1}{2}$ times as wide as the axial ribs, deep. Sutures deeply impressed, rendered sinuous by the summits of the ribs. Periphery and the short base of the last whorl well rounded, marked by the feeble continuations of the axial ribs and numerous, exceedingly fine, closely spaced, spiral striations; the latter may also be seen on the spire. Aperture moderately large, subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within, inner lip moderately long, almost straight, provided with a very feeble fold at its insertion.

The type (Cat. No. 211548, U.S.N.M.) was collected by Mr. Kelsey at San Diego, California. It has 12 post-nuclear whorls and measures: Length, 6.9 mm.; diameter, 1.5 mm.

This species follows *Turbonilla (Strioturbonilla) serræ* in the key.

TURBONILLA (STRIOTURBONILLA) COOKEANA, new species.

Plate 35, fig. 3.

Shell elongate-conic, yellowish-white, with a darker yellow band a little posterior to the middle between the sutures. (Nuclear whorls decollated.) Post-nuclear whorls moderately rounded, somewhat exerted near the summit; marked by moderately strong rounded, slightly protractive axial ribs, of which 18 occur upon the second to fourth, 20 upon the fifth and sixth, 24 upon the seventh and eighth,

and 28 upon the penultimate turn. Intercostal spaces about $1\frac{1}{2}$ times as wide as the ribs, marked by a double series of large pits of which one is at the periphery, the other a little posterior to the middle between the sutures. In addition to these pits, the intercostal spaces are marked by 11 fine, incised lines between the summit and the median series of pits and 18 between the median and the peripheral pits. These fine incised lines are of about equal strength and spacing. They do not extend from the intercostal spaces at the suture where a very narrow band is left without sculpture. The depressed intercostal spaces and ribs terminate at the well rounded periphery of the last whorl. Suture well impressed. Base of the last whorl moderately long, marked by 24 fine incised spiral lines, which are a little closer spaced near the umbilicus than at the periphery. Aperture subquadrate; posterior angle acute; outer lip thin, showing external markings within; inner lip slightly sinuous, feebly reflected with a slender fold a little anterior to its insertion; parietal wall closed with a fine callus.

The type (Cat. No. 211550, U.S.N.M.) has ten whorls and measures: Length, 6.9 mm.; diameter, 1.7 mm. It was collected by Miss J. M. Cooke in Gulf of California and is named for her.

This species follows *Turbonilla (Strioturbonilla) gracilior* in the key.

TURBONILLA (PYRGOLAMPROS) TALMA Dall and Bartsch.

Plate 35, fig. 7.

Turbonilla (Pyrgolampros) talma DALL and BARTSCH, Dep. Mines, Geol. Surv., Canada, 1910, pp. 13-14, pl. 2, fig. 3.

Shell, broadly elongate-conic, dark chestnut brown, wax-yellow at the apex and the columellar area. Nuclear whorls decollated. Post-nuclear whorls moderately rounded, feebly shouldered at the summit, marked by strong, well-rounded, axial ribs, of which 18 occur upon each of the turns. Intercostal spaces about two-thirds as wide as the ribs, well impressed. Sutures strongly impressed. Periphery of the last whorl well rounded. Base moderately long, and well rounded, showing scarcely any traces of the axial ribs. Entire surface of spire and base crossed by numerous fine, closely spaced, spiral striations. Aperture oval; posterior angle acute; outer lip thin, showing a lighter band half way between the periphery and the summit, in the general chestnut coloration; inner lip slender, twisted and slightly revolute, white.

Two specimens of this species were dredged in Barkley Sound, Vancouver Island, British Columbia, one of which is in the Geological Survey Museum, Ottawa; the other in the collection of the United States National Museum, Cat. No. 211537. One of these has lost the nucleus, the 10 remaining whorls measuring: Length, 9 mm.; diameter, 2.8 mm.

This species follows *Turbonilla (Pyrgolampros) taylori* in the key.

TURBONILLA (PYRGOLAMPROS) GLORIOSA, new species.

Plate 35, fig. 9.

Shell very slender, elongate-conic, wax-yellow, with a broad, brown band which on the early and the later whorls extends over the anterior half, between the sutures, while on the middle ones it covers fully two-thirds of that space. Nuclear whorls decollated. Post-nuclear whorls flattened in the middle, rounding moderately toward the summit and the periphery, marked by strong, regular, retractive, axial ribs, of which 14 occur upon the second of the remaining turns, 16 upon the third, 18 upon the fourth to sixth, 20 upon the seventh and eighth, while upon the remaining volutions they become much enfeebled and less regular. These ribs upon the middle whorls are strongest in the middle, sloping gently toward the summit and the periphery, the slope at the summit lending them a shouldered effect. Intercostal spaces deeply impressed, about as wide as the ribs. Sutures strongly impressed. Periphery of the last whorl somewhat inflated, well rounded. Base moderately long, well rounded, marked by the feeble continuations of the axial ribs. Entire surface of spire and base crossed by numerous very fine, spiral striations. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the banding of the exterior within; inner lip very oblique, slightly curved, and revolute, with an obscure fold at its insertion; parietal wall glazed with a very thin callus.

The unique type of this species (Cat. No. 211551, U.S.N.M.) was dredged by Mr. Kelsey in 12 fathoms, outside San Diego, California. It has lost the nucleus and probably the first post-nuclear turn; the 11 remaining measure: Length, 8.3 mm.; diameter, 2 mm.

The present species reminds one strongly of *Turbonilla (Pyrgolampros) chocolata* Carpenter. It has the same beautiful general coloration, but differs in having much fewer ribs and in having these shouldered, while in *chocolata* they are perfectly straight to the summit. In the present species the ribs are much more strongly retractive; in *chocolata* they are only slightly so. The present species is also smaller and much more slender.

This species follows *Turbonilla (Pyrgolampros) chocolata* in the key.

TURBONILLA (PYRGOLAMPROS) MACOUNI Dall and Bartsch.

Plate 35, fig. 11.

Turbonilla (Pyrgolampros) macouni DALL and BARTSCH, Dep. Mines, Geol. Surv., Canada, 1910, pp. 15-16, pl. 1, fig. 9.

Shell, large, very broadly elongate-conic, pale wax-yellow, with three chestnut bands. The first of these bands extends over the posterior fourth of the whorls between the sutures, and is less strongly colored than the other two which are very pronounced, about half as

wide as the first, and occupy the space immediately anterior and posterior to the periphery, the space which separates them being a little narrower than the band. Nuclear whorls small, almost 2; depressed helicoid, having their axes almost at right angles to that of the succeeding turns; scarcely at all immersed. Post-nuclear whorls flattened on the posterior two-thirds between the sutures, slightly rounded anteriorly; moderately shouldered at the summit; marked by strong, well-rounded, somewhat sinuous, almost vertical, axial ribs which are about as wide as the spaces which separate them. Of these ribs, 18 occur upon the second, 20 upon the third and fourth, 18 upon the fifth to seventh, 20 upon the eighth and ninth, 22 upon the tenth and penultimate turn. Periphery of the last whorl well rounded. Base of the last whorl moderately long, well rounded, marked by the feeble continuations of the axial ribs. Entire surface of spire and base marked by numerous, closely spaced, very fine, spiral striations. Aperture moderately large, broadly oval; posterior angle obtuse; outer lip thin, showing the external markings within; inner lip slender, moderately curved and slightly revolute; parietal wall glazed with a thin callus.

Specimens of this species were dredged in Barkley Sound, part of which are in the Geological Survey Museum collection in Ottawa, and two in the United States National Museum, where they are listed as Cat. No. 211538, U.S.N.M. One of the specimens has the nucleus and 10 post-nuclear whorls, and measures: Length, 9 mm.; diameter, 3 mm. Another has 10 post-nuclear whorls (having lost the nucleus and probably the first 2 post-nuclear turns), and measures: Length, 14.8 mm.; diameter, 4.5 mm.

In adult shells the basal band becomes much expanded, even to the extent of covering the posterior half of the base.

The present species—the finest of the west American *Pyrgolampros*—recalls *Turbonilla (Pyrgolampros) keepi* Dall and Bartsch, but is much larger than that form, with fewer and stronger ribs.

This species follows *Turbonilla (Pyrgolampros) painei* in the key.

TURBONILLA (PYRGOLAMPROS) PESA Dall and Bartsch.

Plate 35, fig. 5.

Turbonilla (Pyrgolampros) pesa DALL and BARTSCH, Dep. Mines, Geol. Surv., Canada, 1910, p. 14, pl. 2, fig. 5.

Shell, elongate-conic, small, chestnut brown, with a slightly paler, broad, obscure band half way between the sutures. Nuclear whorls decolated. Post-nuclear whorls flattened, slightly shouldered at the summit, marked by feeble, almost vertical, axial ribs, of which 22 occur upon the second, 24 upon the third, 20 upon the fourth and fifth, and 26 upon the sixth of the remaining turns. Upon the penultimate turn the ribs are subobsolete. Intercostal spaces feebly

impressed, of irregular width. Sutures well impressed. Periphery of the last turn somewhat inflated, well rounded. Base short, well rounded. Entire surface of spire and base crossed by numerous very fine, closely spaced, spiral striations. Aperture broadly oval; posterior angle acute; outer lip thin, showing the external markings within by transmitted light; inner lip moderately strong, slightly curved and revolute.

The unique type was dredged in Barkley Sound, Vancouver Island, British Columbia. It has 8 post-nuclear whorls (having lost the nucleus, and probably the first $1\frac{1}{2}$ post-nuclear turns), and measures: Length, 6 mm.; diameter, 1.6 mm.

This species follows *Turbonilla (Pyrgolampros) halistrepta* in the key.

TURBONILLA (PYRGOLAMPROS) RINELLA Dall and Bartsch.

Plate 35, fig. 6.

Turbonilla (Pyrgolampros) rinella DALL and BARTSCH, Dep. Mines, Geol. Surv., Canada, 1910, pp. 14-15, pl. 1, fig. 2.

Shell, elongate-conic, reddish wax-yellow, a little lighter on the posterior half between the sutures; anterior half of base almost white. Nuclear whorls decollated. Posterior two-thirds of the post-nuclear whorls between the sutures flattened; anterior third rounding moderately toward the periphery; whorls marked by feebly developed, low, broad, retractive, axial ribs, which are separated by narrow, shallow, intercostal spaces. Of these ribs, 22 occur upon the fourth, 24 upon the fifth and sixth, 26 upon the seventh, and about 42 upon the last of the remaining turns. Upon the last they are very irregular and even less strongly developed than on the preceding. Suture well impressed. Periphery of the last whorl somewhat inflated, well rounded, with scarcely any traces of axial sculpture. Entire surface of spire and base marked with numerous wavy, closely spaced, spiral striations. Aperture broadly oval; posterior angle acute; outer lip thin; inner lip oblique, slender, and revolute; parietal wall covered with a fairly thick callus.

The unique type was collected in Barkley Sound, Vancouver Island, British Columbia, and is in the collection of the Geological Survey, Ottawa. It has 9 whorls remaining, which measure: Length, 8.5 mm.; diameter, 2.3 mm.

This species follows *Turbonilla (Pyrgolampros) pesa* in the key.

TURBONILLA (PYRGISCUS) GRIPPI, new species.

Plate 36, fig. 9.

Shell very elongate-conic, light chocolate brown. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, slightly shouldered about one-third of the distance between the sutures, anterior to the summit, marked by rather strong, decidedly retractive, axial ribs, of

which 20 occur upon the second, 18 upon the third to sixth, 20 upon the seventh, 26 upon the eighth to tenth, and 30 upon the penultimate whorl; upon the last 5 whorls they are less regular in size and spacing than on the preceding. Intercostal spaces about twice as wide as the ribs on the first 7 whorls, averaging a little less in width upon the remaining; the intercostal spaces are strongly impressed, and marked with 6 strongly impressed series of spirally spaced pits, the first one below the summit being a little farther from the summit than from its neighbor; between these spiral pits occur finer incised lines, of which there are 10 between the summit and the first strong pit, 1 each between the first and second, and second and third, 2 between the third and fourth, 3 between the fourth and fifth, and 2 between the fifth and sixth; the strong incised lines pass up on the sides of the ribs, constricting the ribs where they meet them; the fine lines are not apparent upon the ribs. Sutures strongly constricted. Periphery of the last whorl well rounded. Base short, well rounded, marked by about 20 very slender incised spiral lines. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip slightly curved, oblique, reflected, but not adnate to the base; parietal wall covered with a thin callus.

The type (Cat. No. 229011, U.S.N.M.) was collected by Mr. C. W. Gripp, off San Diego, California, and measures: Length, 11 mm.; diameter, 2.7 mm.

This species follows *Turbonilla (Pyrgiscus) castanella* in the key.

TURBONILLA (PYRGISCUS) CALLIMENE, new species.

Plate 36, fig. 7.

Shell moderately large, elongate-conic, flesh colored. Nuclear whorls decollated. Post-nuclear whorls rather high between the sutures, moderately shouldered at the summit, marked by numerous, well-developed, almost vertical, axial ribs, of which 18 occur upon the second and third, 20 upon the fourth, 24 upon the fifth, 28 upon the sixth, 30 upon the seventh, and 34 upon the penultimate turn. Intercostal spaces strongly impressed, about as wide as the ribs. In addition to the axial sculpture, the whorls are crossed by five strong lines of pits, which are distributed over the anterior two-thirds between the sutures, the intercostal spaces on the posterior third being smooth. The anterior three of these five lines of pits are of equal strength and equally spaced; the posterior two are weaker and a little closer together than the rest, the second one being a little farther distant from the median than that is from its neighbor anterior to it. Periphery and the somewhat attenuated base of the last whorl well rounded, marked by the feeble continuations of the axial ribs and by nine incised, spiral lines, which vary considerably in strength and spacing. The first two of these, below the five already described, are of about the same strength as those immediately above the suture;

the remainder are not so wide and are less regular. Aperture moderately large, ovate; posterior angle acute; outer lip thin; inner lip oblique, somewhat curved, and slightly revolute; parietal wall glazed with a thin callus.

The type (Cat. No. 211554, U.S.N.M.) comes from San Diego Bay, California. It has lost the nucleus and probably a portion of the first post-nuclear turn; the nine remaining measure: Length, 7.2 mm.; diameter, 2.2 mm.

This species follows *Turbonilla (Pyrgiscus) tenuicula* in the key.

TURBONILLA (MORMULA) SCAMMONENSIS, new species.

Plate 36, fig. 5.

Shell elongate-conic, rather stout, pinkish. Nuclear whorls decolated. Post-nuclear whorls increasing rapidly in size at first, then subcylindric; moderately rounded on the early whorls, flattened on the later; narrowly, tabulatedly shouldered; marked with strong, regular, almost vertical, axial ribs, which extend strongly from the summit to the periphery; of these ribs, 18 occur upon the third and fourth, 20 upon the fifth, 22 upon the sixth and seventh, 24 upon the eighth, and 26 upon the penultimate whorl. On some of the whorls there is a tendency toward the formation of a low varix, due to the fusion of two ribs. Intercostal spaces a little narrower than the ribs, strongly impressed. In addition to the axial ribs, the whorls are marked with incised spiral lines; of these, five occur between the sutures upon the first six whorls, one being at the periphery, another at the middle between the sutures, and two between these; these four divide the space between them into three equal parts; the fifth spiral line is a little nearer the median spiral line than the summit, leaving a broad, plain band at the summit. On the seventh whorl there is an intercollated, fine, spiral line on the middle of the space between the median and the one anterior to it, while on the next whorl an additional spiral line makes its appearance in the same raised band and continues over the rest of the whorls. Summits of the whorls slightly cuspidate and somewhat exerted. Sutures strongly marked. Periphery of the last whorl well rounded. Base moderately long, well rounded, marked by seven equal, incised, spiral lines, which are almost equally spaced, and very feeble continuations of the axial ribs. Aperture moderately large; posterior angle acute; outer lip thickened with an internal callus, and reenforced by four strong, spiral lirations; inner lip stout, slightly curved and somewhat revolute, provided with a strong fold at its insertion; parietal wall glazed with a thin callus.

The above description is based upon two specimens collected by Mr. Henry Hemphill, in Scammon's lagoon, Lower California. One

of these shows the lirations strongly within the aperture; in the other, the greater part of the callus which should contain them has been broken away.

The figured specimen, which is in the United States National Museum, Cat. No. 211552, U.S.N.M., has eight whorls remaining which measure: Length, 7.5 mm.; diameter, 2.1 mm. The other specimen is in Mr. Kelsey's collection.

This species follows *Turbonilla (Mormula) ambusta* in the key.

ODOSTOMIA (BESLA) EXCOLPA, new species.

Plate 36, fig. 6, 6a.

Shell very small, semitranslucent, bluish-white. Nuclear whorls quite large, $2\frac{1}{2}$, forming a moderately elevated, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls decidedly rounded, with the greatest convexity falling on the anterior third of the whorls, between the sutures, appressed at the summit, marked by decidedly sinuous, slender, axial ribs, of which about 18 occur upon the first and second, 20 upon the third, and 28 upon the penultimate turn. Intercostal spaces about three times as wide as the ribs. In addition to the axial sculpture, the whorls are crossed by three equal and subequally spaced, spiral threads, which are almost as strong as the axial ribs. The first of these is situated at the posterior termination of the anterior third, between the sutures, while the third marks the periphery, the second being halfway between the two. The intersections of the spiral threads and axial ribs are slightly nodulose, while the spaces inclosed between them appear as almost square pits. Base well rounded, marked by four slender, spiral threads and the feeble continuations of the axial ribs, which extend to the umbilical area. Sutures strongly impressed. Aperture ear-shaped; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip slightly curved, decidedly revolute, adnate to the base, provided with a strong, oblique fold at its insertion; parietal wall covered with a thick callus, which connects the insertion of the inner lip with the posterior angle of the aperture.

The type (Cat. No. 198903a, U.S.N.M.) was collected by Dr. Edward Palmer at the head of the Gulf of California. It has five post-nuclear whorls and measures: Length, 2 mm.; diameter, 0.7 mm.

The present species recalls *Odostomia (Besla) convexa* Carpenter, from which it differs in having the whorls much more rounded and in having the ribs decidedly flexuose, and four instead of eight spiral threads on the base.

ODOSTOMIA (CHRYSALLIDA) HETEROCINCTA, new species.

Plate 36, figs. 4, 4a.

Shell moderately large, elongate-conic, with decidedly channeled sutures, white. Nuclear whorls at least 2, forming a depressed helicoid spire, which is obliquely, almost one-half immersed in the first of the succeeding turns. Post-nuclear whorls moderately rounded, marked by strong, decidedly retractive, axial ribs and, on the first four turns, by three spiral cords which equal the ribs in strength; the middle one of these three cords is a little nearer that at the summit than to the one anterior to it. Of the ribs, 16 occur upon all the whorls. The intersections of the ribs and spiral cords form strong, compressed tubercles, the long axes of which coincide with the spiral sculpture. The spaces between the cords and ribs are well rounded, strongly impressed pits. The median cord on the first four whorls is a little stronger than the other two. On the penultimate whorl a slender, spiral cord makes its appearance, between the median and the supraperipheral cord, which on the last turn, immediately behind the aperture, attains a strength equal to that of the spiral cord at the summit. Entire surface of the spire marked by numerous, very fine, incremental lines. Periphery of the last whorl marked by a deep channel across which the axial ribs extend feebly. Base of the last whorl well rounded, marked by four strong spiral keels, which are subequally spaced and grow somewhat weaker successively from the peripheral to the umbilical area. Immediately anterior to the last of these spiral keels there is a single, slender, raised spiral thread. The spaces between the spiral keels are crossed by slender continuations of the axial ribs and very fine lines of growth. Aperture oval; outer lip (fractured); inner lip oblique, strong, slightly reflected upon and adnate to the base, provided with a moderately strong fold at its insertion; parietal wall glazed with a thin callus.

The type, Cat. No. 212033, U.S.N.M., was dredged at United States Bureau of Fisheries station 2932, in 20 fathoms, on sand bottom, bottom temperature 58°, off San Diego, California. It has 6 post-nuclear whorls and measures: Length, 3.2 mm.; diameter, 1.3 mm.

The present species is the first one that we have seen from the west coast of America having three nodulose, spiral cords between the sutures. This should be the first species in the key.

ODOSTOMIA (CHRYSALLIDA) DICELLA, new species.

Plate 36, fig. 1.

Shell small, elongate-ovate, somewhat translucent, bluish-white. Nuclear whorls small, very obliquely immersed in the first of the succeeding turns. Post-nuclear whorls well rounded, marked by four spiral cords between the sutures, the three posterior of which are

nodulose on the early whorls; the fourth, or suprasutural one being smooth. On the last whorl the nodules are obsolete. Of these cords, the one at the summit is the weakest and the second below it the strongest. The spaces between the spiral keels are about half as wide as the keels and rather shallow. In addition to the spiral sculpture the whorls are marked by slender, almost axial riblets, which render the three posterior keels on the early whorls nodulose at their intersections. Of these riblets, about 18 occur upon the second and 22 upon the third whorl. On the fourth, which is the penultimate, the grooves between the keels are crossed by slender axial threads. Sutures strongly constricted. Periphery of the last whorl marked by a narrow, deep sulcus. Base moderately long, well rounded, marked by five spiral cords which grow successively weaker between the periphery and the umbilical area. Grooves between the sutural cords equal, crossed by numerous, slender, axial threads, which cause the spaces between the threads and cords to appear as minute pits. Aperture moderately large, somewhat effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip moderately long, strong, somewhat curved, and reflected over and adnate to the base, provided with a slender fold at its insertion; parietal wall covered with a thin callus.

The type (Cat. No. 211 62, U.S.N.M.), which was collected by Mr. Kelsey at San Diego, California, has 5 post-nuclear whorls and measures: Length, 3 mm.; diameter, 1.5 mm.

This species follows *Odostomia (Chrysallda) helga* in the key.

ODOSTOMIA (CHRYSALLIDA) THALIA, new species.

Plate 36, fig. 3.

Shell small, elongate-ovate, bluish-white, semitranslucent. Nuclear whorls obliquely immersed in the first of the succeeding turns, above which half of the tilted edge of the last volution only projects. Post-nuclear whorls well rounded, feebly shouldered at the summit, marked by very slender, poorly developed, decidedly retractive, axial ribs, of which about 30 occur between the sutures upon the last two volutions. In addition to these axial ribs, the whorls are marked by low, feebly rounded, rather broad spiral cords, of which 6 occur between the sutures, on the second, and 7 upon the third and fourth whorl; the spaces separating the spiral cords are narrow, impressed lines. The intersections of the axial ribs and spiral cords form weak tubercles, while the spaces inclosed between them are roundish pits. Sutures moderately constricted. Periphery of the last whorl well rounded, marked by a cord equalling the one posterior to it in width, and separated from that by a line as wide as those on the spire. Base moderately prolonged, well rounded, marked with 12 low, rounded spiral cords, which decrease successively in width from the periphery,

anteriorly; the spaces separating these cords are also narrow impressed lines. Aperture moderately large, oval; posterior angle acute; outer lip strongly curved showing the external sculpture within; inner lip slightly curved, oblique, reflected over and adnate to the base, provided with a slender fold at its insertion. Parietal wall covered by a thin callus.

The type (Cat. No. 249903, U.S.N.M.) was dredged in 6 fathoms at the north end of Coronado Island, San Diego, by Doctor Baker. It has 5 post nuclear whorls and measures: Length, 2 mm.; diameter, 1 mm.

This species follows *Odostomia (Chrysallida) dicella* in the key.

ODOSTOMIA (MENESTHO) GLORIOSA, new species.

Plate 36, fig. 2, 2a.

Shell moderately large, very elongate-ovate, with very regular, conic spire, bluish-white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which a portion of the last two volutions only project. Post-nuclear whorls flattened, marked by three equal and equally spaced, strong, spiral keels, of which one is at the summit and another about as far above the periphery as the space which separates it from the median keel. The spaces between the spiral keels are deep, rounded grooves, almost as wide as the keels and crossed by numerous, slender, axial threads. Sutures deeply channeled; channels a little more profound than those between the keels. Periphery of the last whorl marked by a sulcus. Base short, well rounded, and marked by four subequal and subequally spaced, spiral cords, the spaces between which appear as rather broad sulci and are crossed by slender axial threads. Aperture small, very oblique, ovate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip short, curved, slightly revolute, provided with a strong fold at its insertion; parietal wall glazed with a thin callus.

The type of this species (Cat. No. 211561, U.S.N.M.) was collected by Mr. F. W. Kelsey at San Diego, California; it has 6 post-nuclear whorls and measures: Length, 2.8 mm.; diameter, 1.3 mm. Another specimen, in Mr. Kelsey's collection, is a little larger than the type, measuring: Length, 3.1 mm.; diameter, 1.4 mm. This was collected by Mr. Henry Hemphill at San Hipolito Point, Lower California.

This species follows *Odostomia (Menestho) recta* in the key.

ODOSTOMIA (MENESTHO) EXCISA, new species.

Plate 36, fig. 8.

Shell moderately large, elongate-ovate, yellowish-white. Nuclear whorls decollated. Post-nuclear whorls well rounded, appressed at the summit, marked by four equally strong but not equally spaced, incised, spiral lines between the sutures. The fourth of these is

immediately above the periphery, while the first is as far below the summit as the third is posterior to the fourth. The second line divides the space between the first and third into equal halves, which are about one and a half times as wide as the spaces included between the third and fourth incised spiral. In addition to the spiral sculpture the whorls are crossed by numerous, fine, decidedly retractive, incremental lines. Periphery of the last whorl somewhat inflated, well rounded. Base moderately long and moderately rounded, crossed by 8 strongly incised, equal, spiral lines, which are a little stronger than those occurring on the spire. These lines become exceedingly closely spaced between the periphery and the umbilical area. The axial sculpture on the base is of the same character and strength as that appearing on the spire. All of the incised, spiral lines on base and spire are crossed by very slender, axial threads, which lend these channels a somewhat pitted appearance. Sutures well impressed. Aperture moderately large, oval, effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip oblique, moderately long, somewhat reflected, and reenforced for the greater part of its length by the attenuated base, provided with an oblique fold at its insertion; parietal wall glazed with a thin callus.

The type (Cat. No. 194518, U.S.N.M.) comes from Catalina Island, California. It has lost the nucleus and probably a portion of the first post-nuclear turn; the five remaining measure: Length, 3.9 mm.; diameter, 1.9 mm.

This species follows *Odostomia* (*Menestho*) *callipyrga* in the key.

ODOSTOMIA (EVALEA) YOUNGI Dall and Bartsch.

Plate 37, fig. 6.

Odostomia (*Evalea*) *youngi* DALL and BARTSCH, Dep. Mines, Geol. Surv., Canada, 1910, pp. 16-17, pl. 2, fig. 1.

Shell, elongate-conic, umbilicated, milk-white. Nuclear whorls small, obliquely immersed in the first of the post-nuclear turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, with a narrow tabulatedly shouldered summit, marked by equally spaced, rather strong, spiral striations, of which about 32 occur between the summit and the periphery on the penultimate turn. Periphery and base of the last whorl inflated, well rounded, marked with spiral sculpture equal in strength and disposition to that on the spire. Sutures strongly impressed. In addition to the spiral sculpture, the whorls are marked with curved retractive lines of growth. Aperture pear-shaped; posterior angle acute; outer lip thin; inner lip slender, curved, and somewhat revolute, provided with a strong oblique fold a little anterior to its insertion; parietal wall glazed with a thick callus.

Two specimens—one of which is in the Geological Survey Museum, Ottawa, and the other in the United States National Museum, Cat. No. 211542—were dredged in 18 to 20 fathoms in Ship Channel, Barkley Sound, Vancouver Island, British Columbia. One of these specimens has 7 post-nuclear whorls and measures: Length, 6.5 mm.; diameter, 2.4 mm.

Named for Mr. C. H. Young, of the Geological Survey, Ottawa, at the request of Mr. John C. Macoun.

This species follows *Odostomia (Evalea) killisnooensis* in the key.

ODOSTOMIA (EVALEA) THEA, new species.

Plate 37, fig. 7; plate 38, fig. 13.

Shell moderately large, elongate-ovate, yellowish-white. Nuclear whorls small, deeply, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, rather high between the sutures, slightly shouldered at the summit, crossed by numerous fine, decidedly retractive lines of growth. The spiral sculpture is strong on the early whorls, becoming gradually finer with the growth of the shell. The first two turns are divided into five, almost equal areas by four equally, strongly incised, spiral lines, between the sutures. On the third whorl the spiral lines are increased to about a dozen and are considerably less strong; on the succeeding turn they are probably almost tripled and still weaker; while on the penultimate volution the sculpture consists of somewhat wavy, closely spaced, spiral striations. Periphery of the last whorl obscurely angulated, somewhat inflated; base moderately long, curving gently to the anterior portion of the shell, marked like the body whorl with fine, spiral lines. Sutures somewhat constricted. Aperture moderately large, oval; posterior angle obtuse; outer lip thin; inner lip rather long, slightly curved, and somewhat revolute, provided with a strong fold at its insertion; parietal wall glazed with a thin callus.

The type (Cat. No. 211556, U.S.N.M.) comes from San Pedro, California. It has 6 post-nuclear whorls and measures: Length, 4.7 mm.; diameter, 2.2 mm.

This species follows *Odostomia (Evalea) youngi* in the key.

ODOSTOMIA (EVALEA) CALLIOPE, new species.

Plate 36, figs. 10, 10a.

Shell elongate-ovate, turreted, narrowly umbilicated, creamy-white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls rather high between the sutures, decidedly, tabulatedly shouldered at the summit, almost flattened below the shoulder, the spaces between the shoulders and the sutures

appearing as cylindrical elements. The whorls are marked by rather strong, incremental lines and by numerous strong, wavy, incised, spiral striations. Periphery and the moderately long base of the last whorl well rounded, marked like the spire. Aperture large, oval; posterior angle decidedly obtuse; outer lip thin; inner lip moderately strong, oblique, somewhat sinuous, slightly reflected, and provided with a fold some little distance anterior to its insertion; parietal wall glazed with a moderately thick callus.

The type (Cat. No. 211557, U.S.N.M.) was dredged at United States Bureau of Fisheries station 4322, in 110 to 199 fathoms, off Point La Jolla, California. It has 5 post-nuclear whorls and measures: Length, 4.2 mm.; diameter, 2 mm.

The present species is nearest related to *Odostomia (Evalea) profundicola* Dall and Bartsch, from which it differs chiefly in being much stouter and proportionately shorter, in having more strongly tabulated shoulders, and in having the surface very strongly, spirally striated, the spiral sculpture in *Odostomia (Evalea) profundicola* being exceedingly fine.

This species follows *Odostomia (Evalea) thea* in the key.

ODOSTOMIA (EVALEA) CALCARELLA, new species.

Plate 37, fig. 4.

Shell very broadly elongate-conic, creamy-white. Nuclear whorls obliquely immersed in the first of the succeeding turns. Post-nuclear whorls moderately well rounded, slightly shouldered at the summit, marked by decidedly retractive lines of growth and numerous, strong, incised, spiral lines. Suture constricted. Periphery of the last whorl subangulated and inflated. Base short, narrowly umbilicated, marked like the spire. Aperture large, somewhat effuse anteriorly; outer lip thin, strongly curved; inner lip slender, decidedly curved and reflected, provided with a moderately strong fold a little anterior to its insertion.

The type (Cat. No. 211587, U.S.N.M.) was dredged by the United States Bureau of Fisheries steamer *Albatross*, at station 2901, in 48 fathoms, off Santa Rosa Island, California. It has 5 post-nuclear whorls and measures: Length, 3.3 mm.; diameter, 1.8 mm.

This species follows *Odostomia (Evalea) calliope* in the key.

ODOSTOMIA (EVALEA) SPREADBOROUGHII Dall and Bartsch.

Plate 38, fig. 8.

Odostomia (Evalea) spreadboroughii DALL and BARTSCH, Dep. Mines, Geol. Surv., Canada, 1910, p. 17, pl. 2, fig. 2.

Shell, elongate-ovate, somewhat translucent, bluish-white. Nuclear whorls small, deeply, very obliquely immersed within the first of the succeeding turns. Post-nuclear whorls inflated, flattened in the

middle, rounded strongly at the summit and the suture, marked by decidedly sinuous, exceedingly fine lines of growth and fine spiral striations; the latter are less strongly developed on the posterior two-thirds between the sutures than on the anterior third and on the base. Sutures strongly constricted. Periphery of the last whorl and base inflated, well rounded, the latter deeply and strongly umbilicated. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip very slender, strongly curved and slightly revolute, provided with a very faint, oblique fold a little anterior to its insertion; parietal wall glazed with a thin callus.

There are three specimens of this species, two of which are in the Geological Survey Museum collection at Ottawa, and one (Cat. No. 211541) is in the United States National Museum. All three were dredged in 18 to 28 fathoms at Ship Channel, Barkley Sound, Vancouver Island, British Columbia. The specimen figured has 5 post-nuclear whorls, and measures: Length, 3.8 mm.; diameter, 1.9 mm.

This species follows *Odostomia (Evalea) esilda* in the key.

ODOSTOMIA (EVALEA) VANCOUVERENSIS Dall and Bartsch.

Plate 37, fig. 1.

Odostomia (Evalea) vancouverensis DALL and BARTSCH, Dep. Mines, Geol. Surv., Canada, 1910, pp. 18-19, pl. 2, fig. 7.

Shell, elongate-ovate, very narrowly umbilicated, turreted, yellowish-white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which only half of the last volution projects and extends beyond the outline of the spire. Post-nuclear whorls broadly, tabulatedly shouldered at the summit, moderately rounded, marked by almost vertical lines of growth and numerous exceedingly fine spiral striations. Sutures rendered very conspicuous by the tabulated shoulder. Periphery of the last whorl well rounded, base moderately long, well rounded, marked like the spire. Aperture large, elongate-ovate, somewhat effuse anteriorly; posterior angle decidedly obtuse; outer lip thin; inner lip slender, oblique, and somewhat revolute, provided with an oblique fold a little anterior to its insertion; parietal wall glazed with a thin callus.

Specimens of this species were dredged in 18 to 28 fathoms at Ship Channel, Barkley Sound, Vancouver Island, British Columbia, part of which are in the collection of the Geological Survey, Ottawa, and others in the United States National Museum, Cat. No. 211539. The specimen figured has 5 post-nuclear whorls, and measures: Length, 4.7 mm.; diameter, 2.2 mm.

The strongly tabulated summit of the whorls separates this species from all the known *Evaleas* of the Oregonian faunal area.

This species follows *Odostomia (Evalea) spreadboroughi* in the key.

ODOSTOMIA (EVALEA) QUADRÆ Dall and Bartsch.

Plate 37, fig. 3.

Odostomia (Evalea) quadræ DALL and BARTSCH, Dep. Mines, Geol. Surv., Canada, 1910, pp. 17-18, pl. 2, fig. 6.

Shell, elongate-ovate, milk-white, umbilicated. Nuclear whorls deeply, obliquely immersed in the first of the post-nuclear turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, moderately shouldered at the summit, marked by faint, slightly retractive lines of growth, and numerous, exceedingly fine, microscopic, spiral striations. In addition to this sculpture, the last whorl shows many weak malleations. Periphery of the last whorl and the moderately long base somewhat inflated, well rounded, marked like the spire. Aperture large, oval; posterior angle acute; outer lip thin; inner lip very oblique, slightly curved and strongly revolute, extending partly over the umbilicus, provided with a moderately strong fold a little anterior to its insertion; parietal wall glazed with a thin callus.

Fifty-three specimens of this species were dredged in 18 to 28 fathoms at Ship Channel, Barkley Sound, Vancouver Island, British Columbia. Part of these are in the Geological Survey Museum collection at Ottawa; the remainder are in the United States National Museum collection, Cat. No. 211540. The figured specimen has 6 post-nuclear whorls, and measures: Length, 6.2 mm.; diameter, 3.2 mm.

This species follows *Odostomia (Evalea) kadiakensis* in the key.

ODOSTOMIA (EVALEA) CALLIMENE, new species.

Plate 38, fig. 2, 2a.

Shell elongate-ovate, milk-white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which only half of the last volution projects, the projecting portion extending considerably beyond the outline of the post-nuclear spire. Post-nuclear whorls slightly rounded, somewhat constricted at the summit, marked by almost vertical lines of growth and very regular, closely spaced, wavy, spiral striations; of the latter about 25 occur between the sutures and the third whorl. Periphery of the last whorl decidedly inflated; strongly rounded; base moderately long, well rounded, with a narrow umbilicus, marked like the spire. Sutures moderately impressed. Aperture large, slightly effuse anteriorly; posterior angle acute; outer lip very thin; inner lip quite long, decidedly flexuose and somewhat reflected, provided with a strong fold opposite the umbilical chink; parietal wall glazed with a thin callus.

The type (Cat. No. 211555, U.S.N.M.) was obtained by Mrs. Oldroyd in deep water at San Pedro, California. It has 5 post-nuclear whorls and measures: Length, 3.1 mm.; diameter, 1.6 mm.

This species follows *Odostomia (Evalea) quadræ* in the key.

ODOSTOMIA (EVALEA) CYPRIA Dall and Bartsch.

Plate 37, fig. 9.

Shell of medium size, narrowly elongate-ovate, umbilicated, yellowish-white. (Nuclear whorls decollated.) Post-nuclear whorls rather high between the sutures, moderately rounded, very feebly shouldered at the summit, marked by fine lines of growth and numerous exceedingly fine, closely-spaced, spiral striations. Sutures very slightly constricted. Periphery of the last whorl very rounded. Base moderately long, well rounded, narrowly umbilicated. Aperture broadly oval, effuse anteriorly; posterior angle obtuse; outer lip thin; inner lip very oblique, slightly curved and revolute, not appressed to the base, provided with a very deep-seated feeble fold at its insertion; parietal wall covered with a thick callus, which renders the peritreme complete.

The unique type, which was dredged by Mr. Spreadborough at Skidegate, is in the collection of the Geological Survey of Canada. It has 5 post-nuclear whorls and measures: Length, 4 mm.; diameter, 2 mm.

This species follows *Odostomia (Evalea) herilda* in the key.

ODOSTOMIA (EVALEA) HYPATIA Dall and Bartsch.

Plate 37, fig. 5.

Shell large, elongate-ovate, strongly umbilicated, yellowish-white. Nuclear whorls deeply immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Post-nuclear whorls well rounded, feebly shouldered at the summit, marked by fine incremental lines, and numerous exceedingly fine, closely spaced, spiral striations. Sutures moderately constricted. Periphery of the last whorl inflated, well rounded. Base moderately long, well rounded, openly umbilicated. Aperture oval, effuse anteriorly; posterior angle obtuse; outer lip thin; inner lip very oblique, slender, curved, and decidedly reflected, but not appressed to the base, provided with a moderately strong fold a little anterior to its insertion; parietal wall glazed with a thin callus.

The unique type of this species, which is in the collection of the Geological Survey of Canada, was dredged by Mr. Spreadborough at Skidegate. It has 6 post-nuclear whorls and measures: Length, 5.2 mm.; diameter, 2.8 mm.

This species follows *Odostomia (Evalea) cypria* in the key.

ODOSTOMIA (EVALEA) BARKLEYENSIS Dall and Bartsch.

Plate 38, fig. 9.

Odostomia (Evalea) barkleyensis DALL and BARTSCH, Dep. Mines, Geol. Surv., Canada, 1910, p. 19, pl. 2, fig. 8.

Shell, small, regularly conic, bluish-white. Nuclear whorls deeply, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls slightly rounded, marked by fine retractive lines of growth and numerous fine, spiral striations. Sutures strongly impressed. Periphery of the last whorl subangulated. Base rather short, sloping from the subangulated periphery to its anterior margin, with a tumid area bounding the narrow umbilicus, marked like the spire. Aperture oval; posterior angle acute; outer lip thin; inner lip decidedly curved and reflected, provided with a strong oblique fold at its insertion; parietal wall glazed with a moderately thick callus.

Specimens of this species were dredged in 18 to 28 fathoms in Barkley Sound, Vancouver Island, British Columbia. Part of them are in the Geological Survey Museum collection at Ottawa, and others in the United States National Museum, Cat. No. 211543. The specimen figured has $5\frac{1}{2}$ post-nuclear whorls, and measures: Length, 3.1 mm.; diameter, 1.4 mm.

This species follows *Odostomia (Evalea) io* in the key.

ODOSTOMIA (EVALEA) COOKEANA Bartsch.

Plate 37, fig. 8.

Odostomia (Evalea) cookeana, BARTSCH, Nautilus, vol. 23, 1910, p. 138, pl. 11, fig. 4.

Shell elongate-ovate, very narrowly umbilicated, yellowish-white. Nuclear whorls very obliquely immersed in the first of the succeeding turns. Post-nuclear whorls very high between the sutures where they are very moderately rounded and marked by rather strong incremental lines and very numerous fine spiral striations. Periphery and base of the last whorl somewhat inflated, the latter strongly rounded and marked like the spire. Aperture large, oval; posterior angle acute; outer lip thin; inner lip decidedly oblique, quite strongly curved in the middle and somewhat reflected, provided with an oblique fold, at its insertion, which is strong within and tapers to a vanishing point at the free edge of the columella; parietal wall glazed with a thin callus.

Two specimens of this species were collected by Doctor Baker at Ellamar, Alaska. One of these, an immature specimen, furnished our description of the nucleus, the other, Cat. No. 208427, U.S.N.M., gave the adult characters. The adult specimen has its nucleus badly eroded. The four remaining whorls measure: Length, 3.2 mm.;

diameter, 2 mm. The young individual which is in Doctor Baker's collection has $3\frac{1}{2}$ whorls and measures: Length, 2.3 mm.; diameter, 1.4 mm.

Named for Miss J. M. Cooke, of San Diego, at the request of Doctor Baker. This species follows *Odostomia (Evalea) pratoma* in the key.

ODOSTOMIA (EVALEA) BALDRIDGEÆ, new species.

Plate 38, figs. 1, 1a.

Shell very elongate-conic, yellowish-white. Nuclear whorls small, immersed in the first of the succeeding turns, above which only half of the last volution projects. Post-nuclear whorls high between the sutures, appressed at the summit, slightly rounded, marked by feeble lines of growth, and many sub-equal and subequally spaced, strongly incised, spiral lines. About 25 of these occur between the sutures of the fourth whorl and about 30 between the summit and the periphery on the penultimate turn. Sutures strongly impressed. Periphery of the last whorl somewhat angulated. Base well rounded, moderately long, marked like the spire. Aperture elongate-oval, slightly effuse anteriorly; posterior angle acute; outer lip decidedly sinuous, bent back at the posterior angle to almost form a notch, thin; inner lip moderately long, oblique, slightly curved and slightly revolute, provided with a strong fold at its insertion; parietal wall glazed with a thin callus.

The unique type (Cat. No. 211558, U.S.N.M.) was collected by Mrs. Elizabeth E. Johnston at San Pedro, California. It has 7 post-nuclear whorls and measures: Length, 5.6 mm.; diameter, 2 mm.

It is named for Mrs. B. L. Baldrige at the request of Miss E. E. Johnston.

This species follows *Odostomia (Evalea) socorroensis* in the key.

ODOSTOMIA (EVALEA) SKIDEGATENSIS, new species.

Plate 38, fig. 7.

Shell elongate-conic, yellowish-white. Nuclear whorls completely immersed in the first of the succeeding turns, above which only half of the last turn projects. Post-nuclear whorls very slightly rounded, feebly shouldered at the summit, marked by incised spiral lines, which are much stronger on the first two volutions than on the remaining. Of these lines, 10 appear upon the second turn. On the last, they are reduced to exceedingly fine striations. Sutures moderately constricted. Periphery of the last whorl decidedly inflated and feebly angulated. Base somewhat prolonged, moderately rounded, marked by fine, closely spaced, spiral striations. Aperture large, oval; posterior angle acute; outer lip thin; inner lip strong, moderately curved, and partly reflected over the base to which it is appressed, provided with a strong fold at its insertion.

Seven specimens of this species were dredged at Skidegate; three at station 5, which may be considered cotypes; two at station 4, and two at station 2. Of these, two of the cotypes are in the collection of the Geological Survey of Canada, and one in the United States National Museum, Cat. No. 220116; of the other two lots one from each station is in the collection of the Geological Survey of Canada and the United States National Museum. The cotype figured has 5 post-nuclear whorls and measures: Length, 3.4 mm.; diameter, 1.6 mm.

This species follows *Odostomia (Evalea) hagemeisteri* in the key.

ODOSTOMIA (EVALEA) PALMERI, new species.

Plate 38, figs. 4, 4a.

Shell very small, elongate-ovate, semitranslucent, bluish-white. Nuclear whorls deeply, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, feebly shouldered at the summit, marked by exceedingly fine, almost vertical lines of growth and microscopic spiral striations. Sutures strongly impressed. Periphery and the rather long base of the last whorl well rounded, marked like the spire. Aperture very large, regularly ovate; posterior angle obtuse; outer lip thin; inner lip very oblique, almost straight, very slender and very slightly revolute; parietal wall glazed with a thin callus.

Two specimens of this species (Cat. No. 198903, U.S.N.M.) were collected by Dr. Edward Palmer at the head of the Gulf of California. The type has 4 post-nuclear whorls and measures: Length, 1.4 mm.; diameter, 0.8 mm.

This species is nearest to *Odostomia (Evalea) tenuis* Carpenter from Mazatlan, but differs from it in not being umbilicated and in having the whorls more rounded and not overhanging.

This species follows *Odostomia (Evalea) granadensis* in the key.

ODOSTOMIA (EVALEA) CASSANDRA, new species.

Plate 38, fig. 5.

Shell small, ovate, very thin, semitransparent, light yellow. Nuclear whorls deeply immersed in the first of the succeeding turns. Post-nuclear whorls very strongly, tabulatedly shouldered at the summit, moderately rounded, marked by fine incremental lines, and numerous exceedingly closely spaced, very fine, spiral striations. Sutures strongly constricted. Periphery of the last whorl well-rounded. Base rather long, well-rounded. Aperture very large, broadly oval; posterior angle decidedly obtuse; outer lip very thin; inner lip very slender, very oblique, somewhat sinuous, strongly curved, and slightly reflected over the base, but not appressed to it, provided with a weak fold some little distance anterior to its insertion.

Two specimens, cotypes, of this species were dredged at Skidegate. One of these has 4 post-nuclear whorls and measures: Length, 2.5 mm.; diameter, 1.3 mm. One is in the collection of the Geological Survey of Canada; the other is Cat. No. 220120 in the United States National Museum.

This species follows *Odostomia (Evalea) palmeri* in the key.

ODOSTOMIA (AMAURA) SUBGLOBOSA, new species.

Plate 37, fig. 2.

Shell moderately large, subglobose, milk-white, very narrowly umbilicated. Nuclear whorls small, deeply, obliquely immersed in the first of the succeeding turns. Post-nuclear whorls well-rounded, narrowly, tabulatedly shouldered at the summit; surface somewhat rough, marked by weak lines of growth and spiral striations; periphery of the last whorl strongly inflated; base short, inflated, marked like the spire. Aperture large, ear-shaped; posterior angle obtuse; outer lip thin at the edge, thick within; inner lip short, strong, twisted, and somewhat revolute, provided with a strong fold a little anterior to its insertion; parietal wall glazed with a moderately thick callus.

Two specimens of this species were collected by Mr. F. W. Kelsey at San Diego, California. One of these, the type, is in the United States National Museum, Cat. No. 211560. It has 6 post-nuclear whorls and measures: Length, 6 mm.; diameter, 4.1 mm. The other is in Mr. Kelsey's collection.

This species follows *Odostomia (Amaura) beringi* in the key.

ODOSTOMIA (AMAURA) HELENA, new species.

Plate 38, fig. 10.

Shell moderately large, yellowish-white, very elongate-ovate. Nuclear whorls small, very obliquely immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Post-nuclear whorls subtabulatedly shouldered at the summit, well rounded, apparently marked by incremental lines only. Sutures strongly constricted. Periphery of the last whorl somewhat inflated, well rounded. Base short, well rounded, broadly umbilicated, marked like the spire. Aperture moderately large, ovate; posterior angle obtuse; outer lip evenly curved; inner lip sinuous, reflected over, but not adnate to the base, provided with a strong oblique fold, which is about one-third of the distance of the length of the inner lip anterior to the insertion of the inner lip. Parietal wall covered with a thick callus.

The type (Cat. No. 249904, U.S.N.M.) was collected by Mrs. Baldrige at San Pedro, California. It has 6 post-nuclear whorls, and measures: Length, 5 mm.; diameter, 2.7 mm. The position of the columellar fold will distinguish this species at a glance from all the other California shells.

This species follows *Odostomia (Amaura) satura* in the key.

ODOSTOMIA (AMAURA) GRIPPIANA, new species.

Plate 38, fig. 11.

Shell large, umbilicated, yellowish-white. Nuclear whorls decollated. Post-nuclear whorls decidedly, slopingly, tabulatedly shouldered at the summit, otherwise moderately rounded; marked by fine incremental lines and numerous, equal and equally spaced, slender, wavy, spiral threads, of which 6 occur upon the shoulder, and about 40 between the shoulder and the suture. Periphery and the moderately long base of the last whorl well rounded, marked like the spire. Aperture moderately large, ear-shaped; posterior angle obtuse; inner lip moderately long, stout, curved, somewhat reflected, provided with a strong fold a little anterior to its insertion; parietal wall glazed with a thin callus.

The type (Cat. No. 211559, U.S.N.M.) was collected by Mr. Gripp at Nanaimo, British Columbia. It has 6 post-nuclear whorls and measures: Length, 7.5 mm.; diameter, 0.4 mm. The fine spiral lirations differentiate this form from all other umbilicate *Amauras*.

This species follows *Odostomia (Amaura) helena* in the key.

ODOSTOMIA (AMAURA) ELDORANA, new species.

Plate 38, fig. 12.

Shell elongate, conic, wax-yellow. (Nuclear whorls decollated.) Post-nuclear whorls moderately well rounded, slightly constricted at the sutures, feebly roundly shouldered at the summit, marked with lines of growth and very fine spiral striations. Periphery of the last whorl well rounded. Base slightly protracted, well rounded, very narrowly umbilicated. Aperture elongate ovate; posterior angle acute; outer lip thin at the edge; inner lip very oblique, somewhat sinuous, reflected over and adnate to the base, provided with a moderately strong fold, a little anterior to its insertion; parietal wall closed by a very thin callus.

The type and another individual (Cat. No. 34246, U.S.N.M.) were collected at Kadiak Island, Alaska. The type has the last 4½ whorls remaining, which measure: Length, 9 mm.; diameter, 4 mm.

This species follows *Odostomia (Amaura) krausei* in the key.

ODOSTOMIA (SCALENOSTOMA) BABYLONIA, new species.

Plate 38, fig. 3.

Shell elongate-conic, light yellowish-brown, excepting the umbilical area, the extreme basal portion and the tip, which are white. Nuclear whorls very small. Post-nuclear whorls flattened, separated by a scarcely impressed suture. On the last three turns the whorls are marked at the periphery by an exceedingly strong, acute, spiral keel, which is slightly bent downward. Base of the last whorl short, well rounded. Entire surface of spire and base smooth, except for exceedingly fine, incremental lines. Aperture oval; posterior angle acute; outer lip rendered }-shaped by the spiral keel; inner lip slender, evenly curved, very slightly revolute; parietal wall glazed with a thin callus.

Two specimens of this species (Cat. No. 127542, U.S.N.M.) come from San Hipolito Point, Lower California. The type has 10 post-nuclear whorls and measures: Length, 3 mm.; diameter, 1.2 mm.

The present species differs from *Odostomia* (*Scalenostoma*) *dotella* Dall and Bartsch in being much larger, much more acicular, and in being brown instead of translucent.

ODOSTOMIA (HEIDA) KELSEYI, new species.

Plate 38, figs. 6, 6a.

Shell small, ovate, bluish-white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, narrowly shouldered at the summit, marked only by moderately retractive lines of growth and numerous exceedingly fine, spiral striations. Sutures subchanneled. Periphery of the last whorl somewhat inflated, well rounded. Base moderately long, sloping evenly from the periphery to the anterior extremity, the area about the umbilicus having a pinched-in effect, and is surrounded by a somewhat tumid area. Aperture large, broadly oval, somewhat flaring at the anterior lateral angle; posterior angle acute; outer lip thin; inner lip decidedly curved and slightly revolute; parietal wall covered with a thick callus which joins the callus of the columella to the posterior angle of the aperture, rendering the peritreme complete. No fold is visible on the columella. Operculum horny, thin pauci-spiral, concavo-convex, the convex side being the outer.

Two specimens of this species were collected at San Diego, California. One of these, the type (Cat. No. 211544, U.S.N.M.), has 5 post-nuclear whorls and measures: Length, 2.7 mm.; diameter, 1.5 mm. The other specimen is in Mr. Kelsey's collection.

EXPLANATION OF PLATES.

PLATE 35.

Fig. 1. *Turbonilla* (*Strioturbonilla*) *encella*; type; 4.5 mm.; p. 265.

The fine spiral striations have been omitted in this figure.

1a. Nucleus of the same much enlarged.

2. *Turbonilla* (*Strioturbonilla*) *dracona*; type; 6.9 mm.; p. 266.

The fine spiral striations have been omitted in this figure.

2a. Nucleus of the same much enlarged.

3. *Turbonilla* (*Strioturbonilla*) *cookeana*; type; 6.9 mm.; p. 266.

4. *Turbonilla* (*Chemnitzia*) *clarinda*; type; 4.7 mm.; p. 264.

4a. Nucleus of the same much enlarged.

5. *Turbonilla* (*Pyrgolampros*) *pesa*; type; 6 mm.; p. 269.

6. *Turbonilla* (*Pyrgolampros*) *rinella*; type; 8.5 mm.; p. 270.

7. *Turbonilla* (*Pyrgolampros*) *talma*; type; 9 mm.; p. 267.

8. *Turbonilla* (*Strioturbonilla*) *dinora*; type; 9.2 mm.; p. 264.

The fine spiral striations have been omitted in this figure.

9. *Turbonilla* (*Pyrgolampros*) *gloriosa*; type; 8.3 mm.; p. 268.

10. *Turbonilla* (*Strioturbonilla*) *bakeri*; type; 8 mm.; p. 265.

The fine spiral striations have been omitted in this figure.

10a. Nucleus of the same much enlarged.

11. *Turbonilla* (*Pyrgolampros*) *macouni*; type; 9 mm.; p. 268.

PLATE 36.

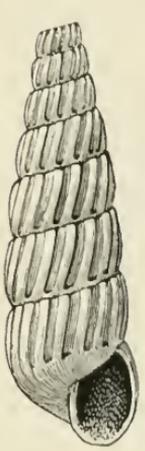
- Fig. 1. *Odostomia (Chrysallida) dicella*; type; 3 mm.; p. 274.
 2. *Odostomia (Menestho) gloriosa*; type; 2.8 mm.; p. 276.
 2a. Nucleus of the same much enlarged.
 3. *Odostomia (Chrysallida) thalia*; type; 2 mm.; p. 275.
 4. *Odostomia (Chrysallida) heterocincta*; type; 3.2 mm.; p. 274.
 4a. Nucleus of the same much enlarged.
 5. *Turbonilla (Mormula) scammonensis*; type; 7.5 mm.; p. 272.
 6. *Odostomia (Besla) excolpa*; type; 2 mm.; p. 273.
 6a. Nucleus of the same much enlarged.
 7. *Turbonilla (Pyrgiscus) callimene*; type; 7.2 mm.; p. 271.
 8. *Odostomia (Menestho) excisa*; type; 3.9 mm.; p. 276.
 9. *Turbonilla (Pyrgiscus) grippi*; type; 11 mm.; p. 270.
 10. *Odostomia (Evalea) calliope*; type; 4.2 mm.; p. 278.
 10a. Nucleus of the same much enlarged.

PLATE 37.

- Fig. 1. *Odostomia (Evalea) rancouverensis*; type; 4.7 mm.; p. 280.
 The fine spiral striations have been omitted in this figure.
 2. *Odostomia (Amaura) subglobosa*; type; 6 mm.; p. 286.
 3. *Odostomia (Evalea) quadra*; type; 6.2 mm.; p. 281.
 The fine spiral striations have been omitted in this figure.
 4. *Odostomia (Evalea) calcarella*; type; 3.3 mm.; p. 279.
 5. *Odostomia (Evalea) hypatia*; type; 5.2 mm.; p. 282.
 The fine spiral striations have been omitted in this figure.
 6. *Odostomia (Evalea) youngi*; type; 6.5 mm.; p. 277.
 7. *Odostomia (Evalea) thea*; type; 4.7 mm.; p. 278.
 8. *Odostomia (Evalea) cookeana*; type; 2.3 mm.; p. 283.
 The fine spiral striations have been omitted in this figure.
 9. *Odostomia (Evalea) cypria*; type; 4 mm.; p. 282.
 The fine spiral striations have been omitted in this figure.

PLATE 38.

- Fig. 1. *Odostomia (Evalea) baldridgei*; type; 5.6 mm.; p. 284.
 1a. Nucleus of the same much enlarged.
 2. *Odostomia (Evalea) callimene*; type; 3.1 mm.; p. 281.
 The fine spiral striations have been omitted in this figure.
 2a. Nucleus of the same much enlarged.
 3. *Odostomia (Scalenostoma) babylonica*; type; 3 mm.; p. 287.
 4. *Odostomia (Evalea) palmeri*; type; 1.4 mm.; p. 285.
 The fine spiral striations have been omitted in this figure.
 4a. Nucleus of the same much enlarged.
 5. *Odostomia (Evalea) cassandra*; type; 2.5 mm.; p. 285.
 The fine spiral striations have been omitted in this figure.
 6. *Odostomia (Heida) kelseyi*; type; 2.7 mm.; p. 288.
 6a. Nucleus of the same much enlarged.
 7. *Odostomia (Evalea) skidegatensis*; type; 3.4 mm.; p. 284.
 8. *Odostomia (Evalea) spreadboroughi*; type; 3.8 mm.; p. 279.
 9. *Odostomia (Evalea) barkleyensis*; type; 3.1 mm.; p. 283.
 The fine spiral striations have been omitted in this figure.
 10. *Odostomia (Amaura) helena*; type; 5 mm.; p. 286.
 11. *Odostomia (Amaura) grippiana*; type; 7.5 mm.; p. 287.
 12. *Odostomia (Amaura) eldorana*; type; 9 mm.; p. 287.
 13. *Odostomia (Evalea) thea*; nucleus much enlarged; p. 278.



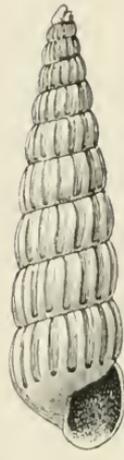
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4



1a



5



2a



6



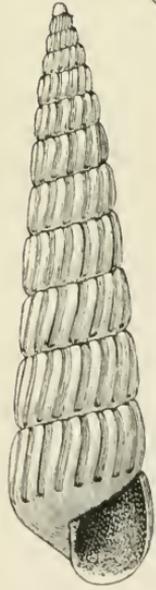
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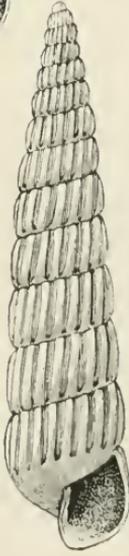
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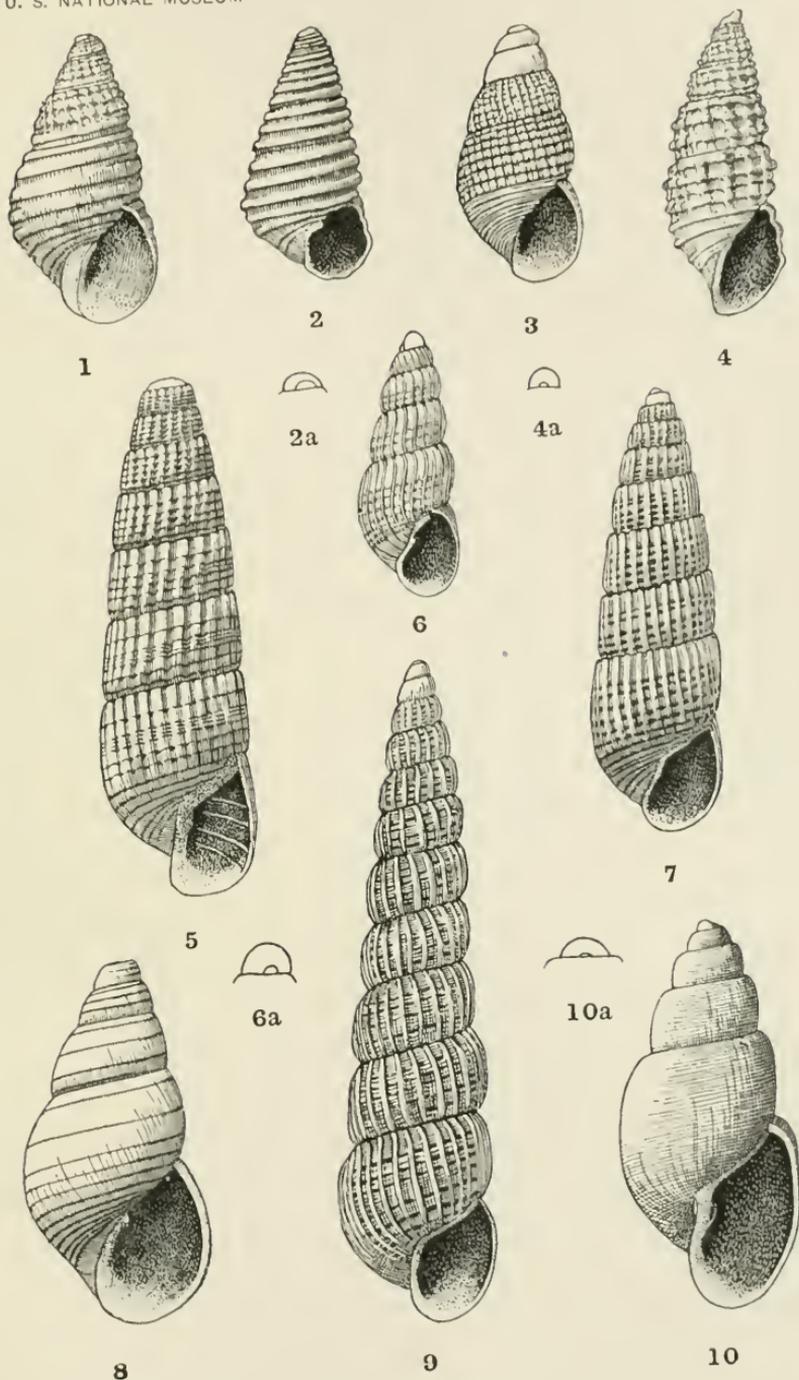
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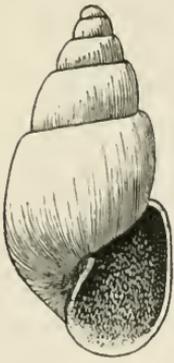
WEST AMERICAN PYRAMIDELLID MOLLUSKS.

FOR EXPLANATION OF PLATE SEE PAGE 283.

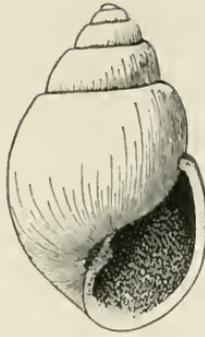


WEST AMERICAN PYRAMIDELLID MOLLUSKS.

FOR EXPLANATION OF PLATE SEE PAGE 289.



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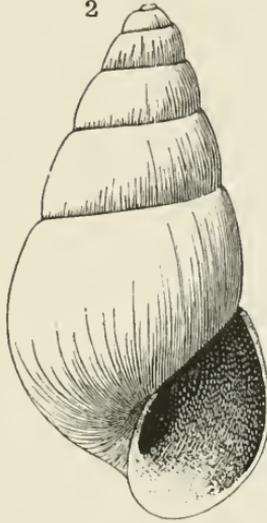
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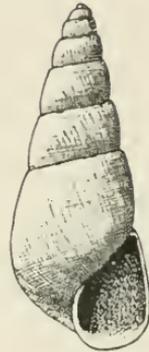
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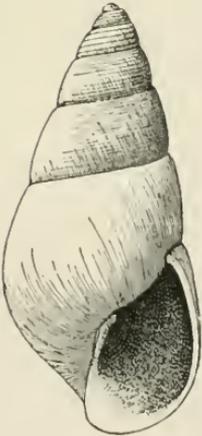
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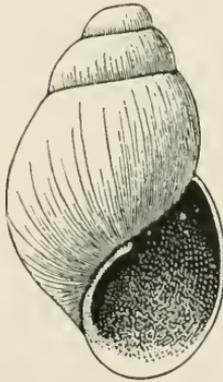
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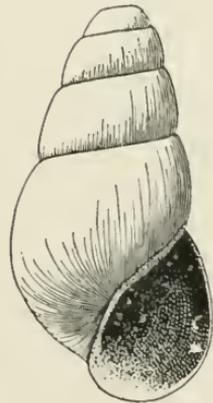
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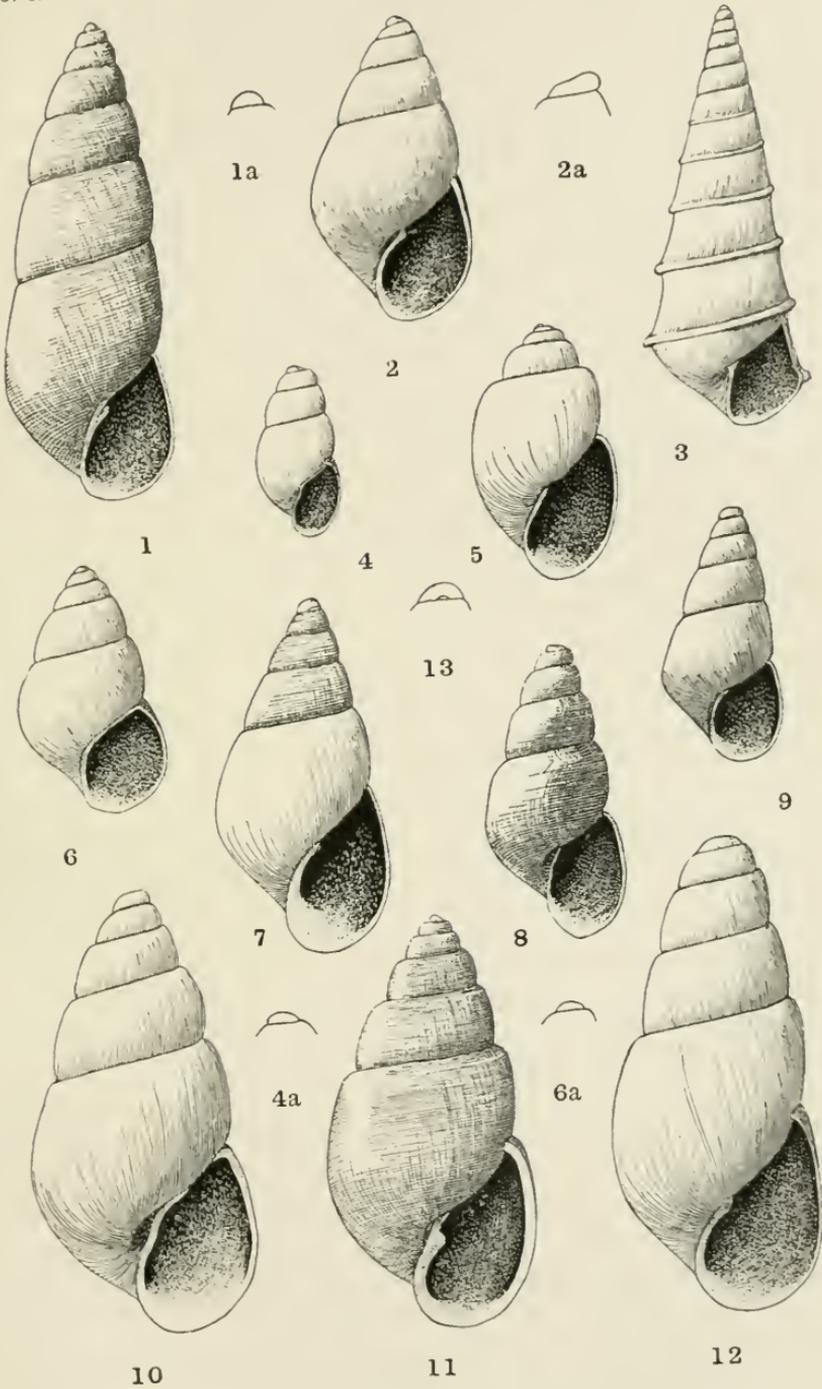
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9

WEST AMERICAN PYRAMIDELLID MOLLUSKS.

FOR EXPLANATION OF PLATE SEE PAGE 289.



WEST AMERICAN PYRAMIDELLID MOLLUSKS.

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