

DESCRIPTIONS OF NEW WEST AMERICAN MARINE
MOLLUSKS AND NOTES ON PREVIOUSLY DESCRIBED
FORMS.

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The present paper describes and figures new species of West American mollusks belonging to groups which I have previously monographed. It represents material that has come to hand since the monographs were issued. By far the larger portion of the specimens were discovered by the U. S. Bureau of Fisheries steamer *Albatross*, but many were contributed by private West American collectors, whose zeal and efforts continue to materially increase our knowledge of marine life from year to year. In addition to the descriptions of new forms, references to species (chiefly fossil) described by other authors since the monographs were published have been added, and wherever new information on nuclear characters was available it is stated.

I had hoped to be able to present with this a new classification of the Rissoidae, but the slowness attending the acquiring of certain material necessary to a complete understanding of the group has decided me not to withhold the manuscript longer, but to publish the data pertaining to members of that family under the old familiar designation, reserving the necessary changes for the final revision.

I wish to express my thanks to all the students who have contributed material to this study, acknowledgment for which is made under the various species. Credit is due to the photographic division of the United States National Museum for the splendid enlarged photographs of the species described, and to Mrs. E. B. Decker for the careful and painstaking work of perfecting these illustrations by retouching.

PYRAMIDELLIDA (LONGCHAEUS) COOPERI Anderson and Martin.

Plate 42, fig. 3.

Pyramidella cooperi ANDERSON and MARTIN, Proc. Cal. Acad. Sci., ser. 4, vol. 4, 1914, p. 66, pl. 7, figs. 18a 18b.

Shell elongate conic, stout, grayish white. All the early whorls decollated, the three remaining strongly channeled at the summit, flattened between the summit and the peripheral sulcus, angulated

posterior to the sulcus. The space between the peripheral angle and the channeled summit forms a decided groove that separates the whorls. Base short, well rounded. The entire surface of the shell is marked by fine incremental lines and well-marked spiral striations. Aperture moderately large, oval; posterior angle acute; outer lip evenly curved; inner lip strong, straight, revolute, provided with three folds, of which the posterior is very strong, lamellar and parallelly disposed to the peripheral sulcus; the other two folds are less strong and much more oblique.

The specimen described and figured, Cat. No. 194405, U.S.N.M., was collected by Mr. George H. Eldridge in the lower Miocene bluffs of Kern River, 1 mile below the power developing station, on the north side of the river at Bakersfield, California; it consists of the last three whorls, and measures—length 6 mm., diameter 3.6 mm.

PYRAMIDELLA (LONGCHAEUS?) PACKI Dickerson.

Odostomia packi DICKERSON, Bull. Dept. Geol. Univ. Cala., vol. 9, No. 17, 1916, p. 498, pl. 37, fig. 2.

The type, an incomplete specimen of 12 whorls, measures—length 10 mm., diameter 3.5 mm. It was collected in the Eocene, Tejon formation, at University of California locality 2226, Rose Canyon, San Diego County, California.

Of this the author states that the inner lip is marked by two plaits "which is characteristic of this genus." *Odostomia never* has more than *one plait*. The figure shows a *Pyramidella* with basal portion of the aperture lost, which is probably responsible for the absence of the third fold characterizing the subgenus *Longchaeus*, to which I believe the shell belongs.

PYRAMIDELLA (PHARCIDELLA) MAGDALENENSIS, new species.

Plate 42, fig. 1.

Shell elongate conic, very pale horn yellow; nuclear whorls two, well rounded, forming a depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls flattened, narrowly shouldered at the summit with a deep spiral groove at the periphery which shows in the suture of all the turns and gives this the appearance of being deeply channeled. Summit of whorls strongly crenulated, the weak depressions on the sides of the crenulation passing down the sides of whorls for a short distance below the summit; the rest of the surface being marked by fine lines of growth and exceedingly fine spiral striations. The deep peripheral sulcus is crossed by slender axial riblets, which are more slender and more numerous

than the crenulations at the summit of the whorls. Base moderately long, well rounded, provided with a strong fasciole at the anterior end and marked by rather strong incremental lines and very fine spiral striations. Aperture oval, posterior angle acute, outer lip thin, showing four denticles within, of which the median two are the strongest; inner lip thick, almost straight, provided with three folds, of which the first is lamellar and almost transversely disposed; it covers the posterior portion of the basal fasciole; the other two folds are much weaker and much more obliquely placed and extend to the anterior portion of the columella; parietal wall glazed with a thin callus.

The type, Cat. No. 268628, U.S.N.M., was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5628, off Redondo Point, Magdalena Bay, Lower California, in $13\frac{1}{2}$ fathoms, on broken shell bottom. It has 9 postnuclear whorls and measures—length, 5.8 mm.; diameter, 2.1 mm.

This species is nearest related to *Pyramidella (Longchaeus) mazatlanica* Dall and Bartsch, but can readily be distinguished from it by the fact that the whorls are not overhanging.

EULIMELLA GABBIANA Anderson and Martin.

Eulimella gabbiana ANDERSON and MARTIN, Proc. Cal. Acad. Sci., ser. 4, vol. 4, 1914, p. 68, pl. 7, fig. 20.

This is a typical *Melanella (Eulimella)* and does not belong to the Pyramidellidae, but to the related family, Melanellidae. The name will therefore have to be changed to *Melanella gabbiana* Anderson and Martin. The type No. 143 California Academy of Sciences comes from the Lower Miocene, in the bottom of a small canyon about $1\frac{1}{4}$ miles due north of Barker's ranch house, Kern River, Kern County, California.

PYRAMIDELLA (SYRNOLA) OCHSNERI Anderson and Martin.

Eulimella ochsneri ANDERSON and MARTIN, Proc. Cal. Acad. Sci., vol. 4, 1914, p. 66, pl. 7, figs. 23a and 23b.

Anderson and Martin described this species which they collected in the Lower Miocene in the bottom of a small canyon about $1\frac{1}{4}$ miles due north of Barker's ranch house, Kern County, California, locality 64. They give a rather incomplete description and state that the type, which has a broken apex, is 8 mm. long and 3 mm. in diameter.

From the brief description and the figure I am inclined to believe that it is not a *Eulimella*, but belongs to the subgenus *Syrnola*. A comparative statement in the same publication (p. 67) under *Eulimella dilleri* strengthens this belief. The type, No. 138, and cotype, No. 139, are in the California Academy of Sciences.

PYRAMIDELLA (SYRNOLA) DILLERI Anderson and Martin.

Eulimella dilleri ANDERSON and MARTIN, Proc. Cal. Acad. Sci., vol. 4, 1914, p. 67, pl. 7, fig. 24.

Anderson and Martin found this species in the sea cliff (Miocene), one-quarter mile north of the lighthouse at Cape Foulweather, 4 miles north of Yaquina Bay, locality 37. The type, No. 140, California Academy of Sciences, consists of the last eight whorls and measures 9.5 mm. long and 3.5 mm. wide.

TURBONILLA (STRIOTURBONILLA) CANADENSIS, new species.

Plate 44, fig. 11.

Shell elongate conic, slender, yellowish white. Nuclear whorls small, two and one-half, depressed helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Postnuclear whorls almost flattened, rather high between the sutures, appressed at the summit, marked by quite regular, slightly curved, protractive, axial ribs, of which 14 occur upon the first, 16 upon the second and third, 18 upon the fourth to seventh, 20 upon the eighth, and 22 upon the ninth and the penultimate turn. Intercostal spaces not quite as wide as the ribs, deeply impressed, terminating at the periphery, which is decidedly angulated. There is a smooth space between the periphery and the succeeding whorl, which falls at some little distance anterior to the periphery of the preceding turn. This gives the whorls a somewhat overhanging appearance. Suture well constricted. Base short, well rounded, entire surface marked by microscopic striations. Aperture subquadrate, posterior angle obtuse; outer lip thin; inner lip slightly curved and somewhat revolute.

The type, Cat. No. 273964, U.S.N.M., was collected by G. Willett, at Forrester Island, Alaska. It is a complete specimen of 11 post-nuclear whorls, and measures—length, 6.3 mm.; diameter, 1.5 mm. Two additional specimens of this species are in Mr. Willett's collection.

TURBONILLA (STRIOTURBONILLA) MONTEZUMA, new species.

Plate 44, fig. 1.

Shell broadly elongate conic, yellowish-white, nuclear whorls two and one-fourth, well rounded, forming a very depressed helicoid spire, having its axis at a right angle to that of the succeeding turns in the first of which it is about one-fourth immersed. Postnuclear whorls well rounded, appressed at the summit, ornamented with very strong, narrow, well rounded, slightly protractive axial ribs of which 18 occur upon the first, 16 upon the second, 14 upon the third to

seventh, and 18 upon the penultimate turn. These ribs become somewhat enfeebled and slightly expanded toward the summit. Intercostal spaces about $3\frac{1}{2}$ times as wide as the ribs marked by a double series of incised pits, of which one is midway between the summit and the periphery while the other is at the periphery. The space between the summit and the median pit is marked by 13 slender incised striations of varying strength, while that between the median and peripheral pit is crossed by 9 incised lines. Suture moderately constricted. Periphery of the last whorl angulated, marking the termination of the axial ribs and intercostal spaces. Base very short, well rounded, marked by 14 subequal and subequally spaced feebly incised wavy spiral striations and slender incremental lines. Aperture very short, decidedly subquadrate, the angles at the junction of the outer and basal lip and the basal and inner lips being almost right angles; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip very slightly oblique, and slightly revolute; parietal wall glazed by a thin callus.

The type, Cat. No. 268232 U.S.N.M., was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678, off Redondo Point, Magdalena Bay, Lower California, in $13\frac{1}{2}$ fathoms, on broken shell bottom. It has 9 postnuclear whorls and measures—length, 4.7 mm.; diameter, 1.5 mm.

TURBONILLA (STRIOTURBONILLA) BARKLEYENSIS, new species.

Plate 42, fig. 8; plate 44, fig. 9.

Shell large, slender, elongate conic, bluish white. Nuclear whorls small, a little more than two and a quarter, depressed helicoid, having their axis at right angles to that of the succeeding turn, in the first of which they are slightly immersed. Postnuclear whorls well rounded, appressed at the summit, marked by slender, curved, moderately regular, slightly protractive, axial ribs, of which 16 occur upon the first to fifth, 18 upon the sixth, 22 upon the seventh and eighth, 24 upon the ninth and tenth, and 26 upon the penultimate turn. Intercostal spaces moderately impressed, terminating a little posterior to the periphery of the whorls. The summit of the succeeding turns falls a little anterior to the termination of the intercostal pits and leaves a smooth band in the suture. Suture moderately constricted. Periphery of the last whorl obtusely angulated. Base moderately long, weakly rounded. The entire surface of the shell is marked by microscopic striations. Aperture large, broad, subquadrate, somewhat effuse at the junction of the basal and the outer lip, posterior angle obtuse; outer lip very thin, showing the external sculpture within; inner lip decidedly oblique, slightly curved and somewhat revolute; parietal wall covered by a thin callus.

The type and 25 specimens of this species were collected by the Geological Survey of Canada, at low tide to deep water, in Barclay Sound, Vancouver Island. Fourteen of these are in the collection of the National Museum, the others are in the Geological Survey of Canada collection.

The type, Cat. No. 211568 U.S.N.M., has lost the nucleus and a part of the first postnuclear turn, the 12 turns remaining measure—length, 9.2 mm.; diameter, 2 mm. The nuclear characters were described from another specimen, bearing the same entry number.

This species was reported in former publications under the name of *Turbonilla* (*Strioturbonilla*) *serrae* Dall and Bartsch, from which it is readily distinguished by its appressed whorls, the summits of *Turbonilla* (*Strioturbonilla*) *serrae* being decidedly shouldered.

TURBONILLA (STRIOTURBONILLA) SANTAMARIANA, new species.

Plate 44, fig. 2.

Shell slender, regularly elongate conic, milk white. Nuclear whorls two and one half, large, well rounded, forming a decidedly elevated spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Postnuclear whorls very high between the sutures, feebly shouldered at the summit, marked by very regular, almost straight, well rounded axial ribs which become slightly enfeebled toward the summit and terminate at the periphery. Of these ribs 14 occur upon the first and second, 16 upon the third to sixth, 18 upon the ninth, and 20 upon the penultimate turn. Intercostal spaces a little wider than the ribs, terminating abruptly, a little posterior to the suture, thus leaving a narrow, smooth, spiral band at the moderately constricted suture. Periphery of the last whorl well rounded. Base moderately long, strongly rounded, marked by incremental lines, and the fine very regularly and closely spaced wavy spiral striations. Aperture elongate oval; posterior angle acute; outer lip thin; inner lip slender, oblique, slightly revolute, without visible fold; parietal wall glazed with a thin callus.

The type, Cat. No. 267744c U.S.N.M., was dredged in shallow water in Santa Maria Bay, Lower California. It has 11 post-nuclear whorls and measures—length, 4.7 mm.; diameter, 1 mm.

TURBONILLA (STRIOTURBONILLA) DOREDONA, new species.

Plate 44, fig. 3.

Shell very regularly, broadly elongate conic, yellowish white. Nuclear whorls $2\frac{3}{4}$, strongly rounded, smooth, forming a strongly elevated spire having its axis at right angles to that of the succeeding turns,

in the first of which the side of the last volution is about one-fifth immersed. Postnuclear whorl well rounded, slightly curved at the appressed summit, marked by rather distantly spaced, slender, narrow, well-rounded axial ribs, which become somewhat flattened and enfeebled toward the summit. Of these ribs 18 occur upon the first, 16 upon the second to fourth, and 18 upon the remaining turns. Intercostal spaces about two and one-half times as wide as the ribs, terminating at little posterior to the suture, thus leaving a very narrow plain band between their termination and the summit of the succeeding turn. Suture moderately constricted. Periphery of the last whorl well rounded. Base short, strongly rounded, marked by the feeble continuations of the axial ribs, which become evanescent before reaching the middle of the base. Entire surface of the shell crossed by rather marked, subequally strong and subequally spaced deeply incised spiral striations. Aperture subquadrate; posterior angle obtuse (outer lip partly fractured); inner lip thick, almost straight, and somewhat revolute, provided with an obsolete oblique fold a little anterior to its insertion; parietal wall glazed by a fine callus.

The type, Cat. No. 268719, U.S.N.M., was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678, off Redondo Point, Magdalena Bay, Lower California, in $13\frac{1}{2}$ fathoms, on broken shell bottom. It has 8 postnuclear whorls and measures—length, 4.2 mm.; diameter, 1.3 mm. The unique type is an adolescent shell, and it is quite possible that when adult specimens are obtained it will be found that the axial ribs terminate at the periphery instead of continuing feebly upon the base.

TURBONILLA (STRIOTURBONILLA) REDONDOENSIS, new species.

Plate 42, fig. 4.

Shell large, broadly elongate conic, yellowish white. Nuclear whorls decollated. Postnuclear whorls strongly rounded, with a strong sloping shoulder which extends over the posterior two-fifths of the whorls. Surface marked by strong, distantly spaced, well-rounded, regular, lamellose, slightly curved, protractively slanting axial ribs, of which 14 occur upon the first three whorls and 16 upon the rest except the last, which has 18. These ribs become somewhat enfeebled and flattened toward the summit and terminate at the periphery. Intercostal spaces about double the width of the ribs, shallow, terminating a very little posterior to the suture, thus leaving a very narrow smooth band immediately posterior to the summit of the succeeding turn. Suture quite strongly constricted. Periphery of the last turn obscurely angulated. Base short, almost flattened, marked by fine incremental lines and fine, rather regularly

and somewhat distantly spaced spiral striations. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip moderately stout, almost vertical, slightly revolute, apparently without fold; parietal wall glazed by a thin callus.

The type, Cat. 268718, U.S.N.M., was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678, off Redondo Point, Magdalena Bay, Lower California, in $13\frac{1}{2}$ fathoms, on broken shell bottom. It has lost the nuclear turns and probably a half of the first postnuclear whorl; the 13 remaining measure—length, 7.4 mm.; diameter, 1.9 mm.

The present species is nearest related to *Turbonilla* (*Strioturbonilla*) *humerosa* Bartsch, but differs from this by having fewer, stronger, and more distantly spaced axial ribs.

TURBONILLA (STRIOTURBONILLA) SCHMITTI, new species.

Plate 43, fig. 8.

Shell elongate conic, rather stout, bluish white. Nuclear whorls small, strongly rounded, forming a decidedly elevated spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Postnuclear whorls almost flattened, somewhat excurved below the strongly tabulately shouldered summit, marked by somewhat sinuous, decidedly protractively slanting, strong, regular, well-rounded axial ribs, of which 20 occur upon the first and second, 22 upon the third, and 24 upon the remaining turns. These ribs extend strongly from the summit of the whorls, where they appear as slender cusps, to the periphery, where they terminate. Intercostal spaces a little wider than the ribs, terminating also at the periphery. Suture rendered strongly channeled by the shouldered summit. Periphery of the last whorl well rounded. Base moderately long, well rounded, marked by strong incremental lines and the exceedingly fine, closely spaced spiral striations which cover the entire surface of the shell. Aperture oval; posterior angle narrowly squarely truncated by the flattened summit; outer lip thin, showing the external sculpture within; inner lip slender, slightly oblique, and weakly revolute, provided with a very feeble oblique internal fold at its insertion which is scarcely noticeable when the aperture is viewed squarely.

The type and two specimens of this species, Cat. No. 265739, U.S.N.M., were obtained in shallow water at Point Abreojos, Lower California. The type has 10 postnuclear whorls and measures—length, 6.3 mm.; diameter, 2 mm. One of the other specimens has 11 postnuclear whorls and measures—length, 7.3 mm.; diameter, 2.1 mm.

This species is quite unlike any of the other known west American forms. It recalls somewhat *Turbonilla (Strioturbonilla) panamensis* C. B. Adams, from Panama, in the very regular and oblique disposition of its axial ribs.

TURBONILLA (PYRGOLAMPROS) HANNIBALI, new species.

Plate 43, fig. 7.

Shell elongate conic, yellowish white. Nuclear whorls decollated. Postnuclear whorls almost flattened, narrowly shouldered at the summit, marked by ill-defined indications of axial ribs, which are entirely too poorly developed to permit counting. The spiral sculpture consists of slender, closely spaced striations. Sutures strongly impressed. Periphery of the last whorl obtusely angulated. Base moderately long, well rounded, marked like the spire. Aperture broadly oval; posterior angle acute; inner lip almost vertical, somewhat sinuous, and slightly reflected.

The type and two additional specimens, Cat. No. 252428, U.S.N.M., were collected by Mr. Harold Hannibal in the Upper Pliocene "Elk River beds," at the mouth of Elk River at Port Orford, Oregon. The type has nine postnuclear whorls and measures—length, 9 mm.; diameter, 2.5 mm.

The present species recalls *Turbonilla (Pyrgolampros) oregonensis* Bartsch, but is larger in every way than that species and has the summit of the whorls appressed, not tabulated; the spiral sculpture also is much more strongly developed. *Turbonilla (Pyrgolampros) hannibali* differs from *Turbonilla (Pyrgolampros) lituyana* Dall and Bartsch in being smaller and in having the ribs much less strongly indicated than in that species.

TURBONILLA (PYRGOLAMPROS) FRANCISCANA, new species.

Plate 42, fig. 2.

Shell elongate conic, flesh colored, excepting a broad chestnut band which covers the median third of the last whorl. This dark band really consists of two chestnut-colored zones, the anterior of which embraces half of the band while the posterior is equal to one-fourth of the width of the dark area, the two being separated by a zone of a little lighter shade which is as wide as the posterior zone. Nuclear whorls decollated in all the specimens seen. Postnuclear whorl rather high between the sutures, feebly shouldered at the summit, and slightly constricted at the periphery. Early postnuclear whorls marked by low, rounded, broad, almost vertical axial ribs which are wider than the shallow impressed spaces that separate them. On the later whorls the axial ribs become quite obsolete. On the first of the postnuclear whorls there are eighteen of these ribs;

on the second to fourth, twenty; on the fifth they become decidedly feeble; and on the remainder they are not at all differentiated. In addition to the axial sculpture the surface of the shell is marked by very fine, wavy, closely spaced spiral striations. Periphery of the last whorl well rounded. Base moderately long, well rounded, marked by lines of growth and spiral striations comparable to those on the spire. Aperture broadly oval; outer lip thin, showing the color markings within. Columella curved, somewhat twisted, and slightly revolute; parietal wall glazed with a thin callus.

The type and 17 specimens, Cat. No. 214435, U.S.N.M., was dredged by the U. S. steamer *Albatross* at station 5743, in 10-15½ fathoms, on very fine sand and mud bottom, San Francisco Bay, California. The type has lost the nucleus and probably the first of the postnuclear turns. The eight remaining measure—length, 6.8 mm.; diameter, 2 mm.

There are three additional lots of specimens in the collection of the United States National Museum, likewise dredged by the U. S. Bureau of Fisheries steamer *Albatross* in San Francisco Bay. These are: Cat. No. 214433, 3 specimens, from station 5729, in 4¾ fathoms, on mud bottom; Cat. No. 214434, 16 specimens, from station 5744, in 5¼ fathoms, on sandy mud bottom; Cat. No. 214436, 4 specimens, from station 5703, in 8½ fathoms, on mud bottom.

This species belongs to the obsoletely sculptured group of *Pyrgolampros*, embracing *halistrepta*, *pesa*, *rinella*, *lituyana*, and *oregonensis*.

TURBONILLA (PYRGOLAMPROS) HEMPHILLI, new species.

Plate 44, fig. 8.

Shell elongate conic. Nuclear whorls moderately large, one and one-half planorboid, having their axis at right angles to that of the succeeding turns, in the first of which they are scarcely at all immersed. The sides of the nuclear whorls project slightly beyond the outline of the spire. Postnuclear turns feebly rounded, appressed at the summit, marked by moderately strong, low, almost vertical axial ribs, which are very feeble on the first two turns, on the third and fourth there are 16, on the fifth to seventh there are 18, while on the last turn they become decidedly enfeebled and too irregular to permit counting. Intercostal spaces shallow, about as wide as the ribs. Suture moderately constricted. The summit of the whorls falls a little anterior to the periphery and gives to the whorls a slightly over-hanging appearance. Periphery inflated, well rounded. Base moderately long, well rounded, marked by the feeble continuations of the axial ribs, which extend to the umbilical chink. Entire surface marked by fine, closely spaced, spiral striations. Aperture broadly oval, posterior angle acute; outer lip thin; inner lip strongly

curved and slightly revolute; parietal wall covered with a thin callus.

The type and 21 specimens, Cat. No. 135053, U.S.N.M., were collected by Henry Hemphill in the Pliocene of a well boring, 140 feet below the surface, at San Diego, California. The type has lost the nucleus and probably half of the first postnuclear turn. The nine remaining whorls measure—length, 6.7 mm.; diameter, 1.9 mm. The nuclear whorls were described from one of the other specimens, which may be considered a paratype.

TURBONILLA (PYRGOLAMPROS) PUGETENSIS, new species.

Plate 44, fig. 4.

Shell small, elongate conic, wax yellow with a broad band of pale brown which extends posterior from the periphery, gradually fading into the general lighter color. Nuclear whorls and early postnuclear turns decollated in all our specimens; those remaining feebly shouldered at the summit, flattened in the middle, becoming considerably contracted and rounded toward the suture, marked by broad, well rounded slightly protractive axial ribs which become somewhat enfeebled and expanded toward the summit. Of these ribs 16 occur upon all of the turns remaining excepting the last which has 18. Intercostal spaces shallow, about as wide as the ribs. Suture moderately contracted. Periphery of the last whorl well rounded. Base somewhat inflated, well rounded, marked by the feeble continuations of the axial ribs which become evanescent before reaching the middle of the base and numerous very fine spiral striations which are also present on the spire. Aperture broadly oval; posterior angle acute; outer lip thin showing the external sculpture within; inner lip decidedly oblique, slender and somewhat revolute; parietal wall glazed with a very thin callus.

The type and 7 specimens, Cat. No. 268754 U.S.N.M., were obtained by the U. S. Bureau of Fisheries at Northwest Point, Elliott Bay, Seattle, Washington. The type consists of the last 5 postnuclear whorls and measures—length, 4 mm.; diameter, 1.5 mm.

TURBONILLA (PYRGOLAMPROS) TREMPERI, new species.

Plate 44, fig. 7.

Shell short, elongate conic, pale brown. Nuclear whorls a little more than two, decidedly depressed helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Postnuclear whorls flattened in the middle, sloping toward the suture and the almost appressed summit, marked by strong lamellar, decidedly retractorily slanting, axial ribs, of which 12 occur upon the first, 14 upon the second to fourth, 16

upon the fifth, 18 upon the sixth, and 16 upon the penultimate turn. These ribs extend prominently to the summit. Intercostal spaces strongly impressed, about $2\frac{1}{2}$ times as wide as the ribs. Suture moderately constricted. Periphery of the last whorl feebly angulated. Base short, well rounded, marked by the very feeble continuations of the axial ribs, which become evanescent before reaching the umbilical chink. Entire surface of the shell marked with fine, closely spaced, spiral striations. Aperture oval, posterior angle obtuse; outer lip thick; inner lip thick, almost straight, and slightly revolute; parietal wall covered by a thin callus.

The type, Cat. No. 250629, U.S.N.M., was collected by Mr. Gripp on kelp, in 15 fathoms, outside of San Diego Bay. It measures—length, 4.7 mm.; diameter, 1.2 mm.

TURBONILLA (PYRGISCULUS) GUILLENI, new species.

Plate 44, fig. 5.

Shell conic, milk white. Nuclear whorls $2\frac{1}{2}$, well rounded, forming a depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Postnuclear whorls somewhat inflated, well rounded, almost appressed at the summit, marked on each whorl by 18 narrow, well developed, rounded, almost vertical axial ribs. Some of these ribs are developed into varices and these are distributed at irregular intervals. Intercostal spaces about $2\frac{1}{2}$ times as wide as the ribs, crossed by three spiral series of strong pits, of which one is at the periphery, the second a little anterior to the middle and the third about two-fifths of the space between this and the summit posterior to the median pit. In addition to these pits the intercostal spaces are crossed by many almost equally strong incised spiral lines of which 12 occur between the summit and the first pit, 7 between the first and median pit, and 8 between the median and peripheral pit. Suture quite strongly constricted. Periphery of the last whorl well rounded. Base moderately long, attenuated, marked by the feeble continuations of the axial ribs and numerous incised spiral lines of a little wider spacing than the fine sculpture on the spire. Aperture rissoid, oval; posterior angle obtuse; outer lip thick; inner lip short, curved, reflected over and appressed to the base; parietal wall covered with a thick callus.

The type, Cat. No. 267736, U.S.N.M., was dredged in shallow water in Santa Maria Bay, Lower California. It has five postnuclear whorls and measures—length, 3 mm.; diameter, 1 mm.

TURBONILLA (PYRGISCUS) DORA, new species.

Plate 42, fig. 10.

Shell very large, elongate conic, uniformly pale brown. Nuclear whorls decollated. Postnuclear whorls well rounded, strongly appressed at the summit, marked on the early whorls by rather strong, almost vertical, axial ribs, which become evanescent on the later turns. Of these ribs 18 occur upon the first to fourth, 20 upon the fifth, 22 upon the sixth, 24 upon the seventh, 26 upon the eighth, 32 upon the ninth, and 34 upon the tenth, while upon the penultimate whorl they become too enfeebled to be counted. The spiral sculpture consists of broad pits and feebly incised lines, the posterior fifth between the sutures being marked by six very fine, subequally spaced, spiral striations. These are followed by two stronger lines, which are succeeded by two strongly impressed pits, these are followed by a pit about half as wide as the last two, then by one a little stronger and finer, then by the widest pit of all, which is succeeded by one not quite as broad. These incised spiral lines pass up on and even cross the summit of the enfeebled ribs. Suture moderately constricted. Periphery of the last whorl decidedly inflated. Base moderately long, somewhat inflated, well rounded, marked by about 25, somewhat wavy, more or less regular, spiral grooves of somewhat varying width, which inclose spaces between them of a width about equal to the grooves, the space between the first of these and the last on the spire is a rather wide band, devoid of sculpture, excepting the fine spiral striations, which cover the entire surface of the shell, in addition to the coarser sculpture already described. Aperture small, subquadrate, posterior angle obtuse; outer lip moderately strong; inner lip oblique, straight and slightly reflected; parietal wall covered by a thick callus.

The type, Cat. No. 250626, U.S.N.M., was collected by Mr. Gripp on kelp, in 15 fathoms, off San Diego Bay. It is minus the nucleus. The 13 remaining whorls measure—length, 13.8 mm.; diameter, 3.2 mm.

TURBONILLA (PYRGISCUS) INA, new species.

Plate 44, fig. 10.

Shell broadly, elongate-conic, bright brown, excepting the nucleus, which is white. Nuclear whorls, two and one-half, planorboid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are about one-third immersed. Postnuclear whorls feebly rounded, appressed at the summit, marked by rather feeble, almost vertical, axial ribs, of which 18 occur upon the second and third, 20 upon the fourth and fifth, and 22 upon the remaining whorls. Intercostal spaces feebly impressed, about as

wide as the ribs, crossed by eleven incised spiral lines between the sutures, of these the fifth is the widest, being fully twice as wide as the third and sixth, which are of equal strength, the remaining are much more slender and also of equal strength. In spacing the first is about as far anterior to the summit as the second is distant from the third, or the fourth from the fifth, or the fifth from the sixth, while the space between the first and second, and those between the sixth and the seventh, are about equal, the spiral markings pass up on the sides of the ribs and the stronger ones tend to cross their summit. Suture moderately constricted. Periphery of the last whorl decidedly angulated. Base short, slightly rounded, marked by the very feeble continuations of the axial ribs, which become evanescent before reaching the middle of the whorls, and thirteen incised spiral lines, which are about equally spaced, the first one below the periphery being a little nearer to its neighbor than the spacing between the rest, the space between the seventh line of the spire and the first incised spiral basal line is a broad, smooth band. Aperture subquadrate, posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip almost straight and slightly revolute; parietal wall covered with a thin callus.

The type, Cat. No. 250625, U.S.N.M., was collected by Mr. Gripp on kelp, in 15 fathoms, off San Diego Bay. It has eight and one-half postnuclear whorls, and measures—length, 6.1 mm.; diameter 1.9 mm.

TURBONILLA (PYRGISCUS) ISTA, new species.

Plate 42, fig. 6.

Shell rather large, elongate conic, light brown. Early whorls light yellow. Nuclear whorls decollated. Postnuclear whorls appressed at the summit, which is slightly excurved, marked by rather poorly developed, almost vertical, axial ribs, which become obsolete on the later whorls. Of these ribs, 18 occur upon the second and third, 20 upon the fourth, 22 upon the fifth, 24 upon the sixth, 26 upon the seventh, 28 upon the eighth, 30 upon the ninth, and 32 upon the tenth, while upon the penultimate they are too irregular to be counted. Intercostal spaces very feebly impressed, about as wide as the ribs. The spiral sculpture consists of strong and weak incised lines, the strong lines pass strongly upon the sides of the ribs and even cross the summit; the first of these strong lines is about one-fifth of the distance between the summit and the suture anterior to the summit, while the spaces between the first and second, the third and fourth, the fourth and fifth, and the fifth and sixth are almost equal and about two-thirds as wide as that between the second and third; of the finely incised spiral lines eight occur between the summit and the first strong line and three between the first and second,

the anterior member of these three being much stronger than the other two; there are also three between the second and third, the last two of these being closer spaced than the first two; no fine lines are apparent between the other strong lines. Suture slightly constricted. Periphery of the last whorl strongly inflated. Base short, well rounded, marked by the feeble continuations of the axial ribs and 22 wavy incised lines, which are of varying width and spacing. Aperture moderately large, subquadrate, posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip oblique, straight, slightly revolute; parietal wall glazed with a moderately thick callus.

The type, Cat. No. 250627, U.S.N.M., was dredged by Mr. Gripp, in 15 fathoms, on kelp off San Diego Bay. It has lost the nucleus. The $11\frac{1}{2}$ whorls remaining measure—length, 12.5 mm.; diameter, 2.8 mm.

TURBONILLA (PYRGISCUS) EVA, new species.

Plate 44, fig. 6.

Shell small, elongate conic, of pale brown ground color, with the incised spiral lines red. Nuclear whorls decollated. Postnuclear whorls gently rounded, on the posterior three-quarters of the shell sloping more abruptly toward the suture, marked by moderately strong, well-rounded, almost vertical axial ribs, of which 22 occur upon the third and fourth, 24 upon the fifth, and 26 upon the penultimate turn. Intercostal spaces a little narrower than the ribs, crossed by 11 strongly incised spiral grooves, which are of varying width. Of these the fourth, seventh, and eleventh are of equal strength and much wider than any of the rest; the remaining, with the exception of the sixth, which is a mere incised line, are of almost equal strength. In spacing the first is about as far below the summit as that is distant from the second, and these two spaces are a little wider than the spaces between the third and fourth, the fifth and sixth, and the seventh and eighth, which are equal and follow next in strength, the remaining spaces are subequal and a little narrower. Suture quite strongly constricted. Periphery of the last whorl inflated, well rounded. Base moderately long, well rounded, marked by the feeble continuations of the axial ribs, which become evanescent before reaching the middle of the base, and 13 subequally spaced incised spiral lines, of which the first three below the periphery are interrupted by the ribs. Aperture oval, posterior angle obtuse; outer lip very thin; inner lip slightly curved, reflected over and appressed to the base; parietal wall covered with a thin callus.

The type, Cat. No. 250630, U.S.N.M., was dredged by Mr. Gripp, on kelp, in 15 fathoms, off San Diego Bay. It has lost the nucleus. The seven whorls remaining measure—length, 4.3 mm.; diameter, 1.2 mm.

TURBONILLA (PYRGISCUS) ALMEJASENSIS, new species.

Plate 45, fig. 10.

Shell slender, elongate conic, milk white. Nuclear whorls decolored in the type (see end of description for this character). The early postnuclear whorls are flattened, the later ones well rounded; all have the summit feebly shouldered. The whorls are ornamented by very regular well rounded axial ribs which become somewhat enfeebled toward the summit. These ribs have a decided protractive slant on the early whorls, while on the middle turns they are vertical, and on the later volutions they have a decidedly retractive slant; here, too, they are a little less strong and less regular and much more closely spaced. Of these ribs 18 occur upon the first four of the remaining turns, 20 upon the fifth, 22 upon the sixth, 24 upon the seventh, 28 upon the eighth, 34 upon the ninth, 36 upon the tenth, and about 52 upon the last turn. Intercostal spaces a little narrower than the ribs, marked by 15 fairly equal and equally spaced spiral series of pits, which are about as wide as the spaces that separate them. Of these pits the first is about one-twelfth the distance between the first basal line and the peripheral series of pits anterior to the summit. On the last whorl, where the axial ribs become decidedly enfeebled, the combination of the axial and raised spiral sculpture gives to the surface a thimble pitted appearance. Suture of the early whorls slightly and of the later strongly constricted. Periphery of the last whorl well rounded. Base attenuated, marked by the very feeble continuations of the axial ribs, and 12 incised spiral lines, which are of irregular strength and spacing. Aperture broadly oval; posterior angle acute; outer lip thin; inner lip slightly curved, decidedly oblique, revolute, and appressed to the attenuated base for almost its entire length, provided with a strong very oblique fold at its insertion; parietal wall covered by a very thick callus.

The type, Cat. No. 266535, U.S.N.M., was dredged in shallow water in Almejas Bay, which is really the southern arm of Magdalena Bay, Lower California. The type had lost the nucleus and probably the first postnuclear turn, the 12 whorls remaining measure—length, 8 mm.; diameter, 1.1 mm. Cat. No. 267747 contains two additional specimens dredged in shallow water in Santa Maria Bay, Lower California. From these we are able to add a description of the nucleus. Nuclear whorls $2\frac{1}{2}$, well rounded, forming a moderately elevated spire, the axis of which is at right angles to that of the succeeding turns, in the first of which the tilted spire is one-fifth immersed.

TURBONILLA (PYRGISCUS) BARTOLOMENSIS, new species.

Plate 45, fig. 5.

Shell conic, yellow. Nuclear whorls decollated. Postnuclear whorls appressed at the summit, flattened in the middle, except the last, which is inflated and strongly rounded. The whorls are marked by rather strong, well-rounded axial ribs, which are slightly retractive slanting on the early turns and decidedly so on the later volutions. Intercostal spaces about as wide as the ribs marked by 12 deeply incised spiral pits. Of these the fifth is a mere line, while the first four, the sixth, ninth, and tenth are about twice as wide, and the eighth and ninth and eleventh and twelfth form deep broad pits fully three times the width of the last. Suture moderately constricted. Periphery of the last whorl strongly inflated, well rounded. Base short, inflated, well rounded, marked by the continuations of the axial ribs, which extend strongly to the umbilical area, between which poorly defined spiral striations may be seen. Aperture short, broadly oval, posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip short, partly reflected, free, provided with an obsolete oblique internal fold at its insertion; parietal wall covered by a very thick callus, which renders the peristome complete.

The type, Cat. No. 268729, U.S.N.M., was dredged in shallow water in San Bartolome Bay, Lower California. It has lost the nucleus, the nine postnuclear whorls measure—length, 5.6 mm.; diameter, 1.6 mm.

This special resembles *Turbonilla (Pyrgiscus) auricoma* Dall and Bartsch in having the inflated last whorl and the reddish incised spiral lines, but differs markedly from it in shape and sculpture.

TURBONILLA (PYRGISCUS) LAMNA, new species.

Plate 43, fig. 1.

Shell regularly, broadly elongate conic, yellowish white. Nuclear whorls $2\frac{1}{2}$ smooth, forming a decidedly depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns in the first of which about one-fourth of the side of the spire is immersed. Postnuclear whorls well rounded, appressed at the summit, ornamented by weak, distantly spaced, somewhat protractive axial ribs, which become flattened and decidedly enfeebled near the summit. Of these ribs 20 occur upon the first and 18 upon the remaining turns. Intercostal spaces about three times as wide as the ribs, shallow, crossed by 13 slender incised spiral lines of somewhat varying width. Of these lines the first to fifth, seventh and twelfth are mere incised lines, while the sixth, eighth, tenth, and

eleventh are about twice as wide as these, and the ninth and thirteenth are double the width of the last. The space between the summit and the first is as wide as the space between the eighth and ninth, which is doubly as wide as that separating the first five lines, which are subequally spaced. The spaces between the eighth and ninth, ninth and tenth, tenth and eleventh, and eleventh and twelfth increase steadily in width, the space between the first of this series being about one-half as wide as that separating the last. Suture moderately constricted. Periphery of the last whorl angulated. Base short, well rounded, marked by the feeble continuations of the axial ribs, which become evanescent before reaching the middle of the base, and 12 feebly incised, slender, wavy, spiral striations, which become successively weaker and closer spaced from the periphery toward the umbilical area. Aperture subquadrate; posterior angle obtuse; outer lip thin; inner lip slender, slightly twisted, provided with a very oblique fold a little anterior to its insertion; parietal wall glazed with a thin callus.

The type and an additional specimen, Cat. No. 268625 U.S.N.M. was dredged along the shore of Santa Maria Bay, Lower California. It has $8\frac{1}{4}$ postnuclear whorls and measures—length, 5.2 mm.; diameter, 1.6 mm.

TURBONILLA (PYRGISCUS) MARIANA, new species.

Plate 45, fig. 9.

Shell very slender, elongate conic, light horn yellow with the anterior half of the base and a narrow band about one-fifth of the width of the space between the sutures pale brown. The band is situated about its own width posterior to the periphery. Nuclear whorls decollated. Postnuclear whorls flattened very high between the sutures, narrowly shouldered at the summit, marked by closely crowded, quite regular, well rounded, almost straight, slightly protractive axial ribs of which 18 occur upon the first four of the remaining turns; 20 upon the fifth to seventh; 22 upon the eighth, and 26 upon the penultimate whorl. Intercostal spaces a little narrower than the ribs, marked by 13 strongly incised, subequal and subequally spaced pits. Suture moderately constricted. Periphery of the last whorl well rounded. Base attenuated, well rounded, marked by the feeble continuation of the ribs which reach to the umbilical chink and five equal and equally spaced, moderately broad, shallow, incised lines of a rust brown color. Aperture elongate oval; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip slender, moderately curved, reflected over and adnate to the attenuated base for two-thirds of its length and provided with a strong oblique fold at its insertion; parietal wall covered by a thick callus.

The type, Cat. No. 267722*b*, U.S.N.M., was dredged in shallow water in Santa Maria Bay, Lower California. It has lost the nucleus and probably the first two postnuclear turns; the nine and a half remaining whorls measure—length, 5.9 mm.; diameter, 1 mm.

TURBONILLA (PYRGISCUS) LAZAROENSIS, new species.

Plate 45, fig. 11.

Shell extremely slender, elongate conic, milk-white. Nuclear whorls decollated. Postnuclear whorls flattened, very high between the sutures, slightly excurved immediately below the feebly shouldered summit, and marked by very regular and regularly spaced well rounded, slightly protractive axial ribs of which 20 occur upon all the remaining turns excepting the last two. Of these the penultimate has 24 and the last 32. Intercostal spaces a little narrower than the ribs, marked by 17 spiral series of pits of which the first 16 are subequal and subequally spaced. The last, the peripheral pit is a little wider than the rest and separated from the sixteenth by a space about five times as wide as those separating the other pits. The first pit is about as far anterior to the summit as the sixteenth is distant from the seventeenth. Suture slightly contracted. Periphery of the last whorl well rounded. Base attenuated marked by the very feeble continuation of the axial ribs and eight wavy incised spiral lines which are of about the same strength but not of equal spacing. A broad band separates the peripheral line of pits from the first basal line; the next three lines are closely and equally spaced, while the fourth is a little farther from the third than that is from the second and the distance between the fourth and fifth is in equal proportions greater than that between the third and fourth. The rest are again narrowly and about equally spaced. Aperture elongate oval; posterior angle acute; outer lip thin showing the external sculpture within by transmitted light; inner lip slightly curved reflected and appressed to the attenuated base for almost its entire length, provided with a very oblique, strong fold at its insertion; parietal wall glazed by a thin callus.

The type, Cat. No. 267742 U.S.N.M., was dredged in shallow water off Lazaro Point, Santa Maria Bay, Lower California. It has lost the nucleus and probably the first 3 postnuclear turns, the 9¼ remaining measure—length, 5.8 mm.; diameter, 0.85 mm.

This species is nearest related to *Turbonilla (Pyrgiscus) mariana* Bartsch from which it differs by its much more slender form and spiral sculpture.

TURBONILLA (PYRGISCUS) CORTEZI, new species.

Plate 45, fig. 12; plate 42, fig. 7.

Shell rather large, elongate conic, pale yellowish brown. Nuclear whorls $2\frac{1}{2}$, well rounded, forming a decidedly depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns in the first of which the tilted edge is about one-fifth immersed. Early postnuclear whorls well rounded, the later ones almost flattened, all appressed at the summit and marked by slender, well-rounded, low, decidedly retractive axial ribs, of which 24 occur upon the first four turns, 22 upon the fifth and sixth, 26 upon the penultimate, and 30 upon the last turn. These ribs become somewhat enfeebled and expanded toward the summit. Intercostal spaces about two times as wide as the ribs, crossed by seven spiral series of pits, of which the second, third, sixth, and seventh are equal and stronger than the rest; the other three being about half as wide and equal. In addition to the above sculpture the entire spire is marked by fine incremental lines and equally fine spiral striations, the combinations of which give to the surface a clothlike texture. Suture feebly impressed. Periphery of the last whorl well rounded. Base moderately long, strongly rounded, marked by incremental lines and 8 rather broad, somewhat wavy, subequal, and subequally spaced spiral lines. The white color of these and the incised stronger lines on the spire stand out in marked contrast to the ground color. Aperture elongate oval; slightly effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip almost straight, slightly revolute; parietal wall glazed with a thin callus.

The type and two additional specimens, Cat. No. 267722, U.S.N.M., were dredged in shallow water in Santa Maria Bay, Lower California. The type is an adolescent specimen and has $8\frac{3}{4}$ postnuclear turns, and measures—length, 6.5 mm.; diameter, 1.9 mm.

One of the other specimens is adult, but has lost the nucleus and probably the first three postnuclear turns. The eight remaining measure—length, 8.3 mm.; diameter, 2.5 mm. This specimen also enables us to say that the last whorl is inflated and that the axial ribs become obsolete on this turn.

TURBONILLA (PYRGISCUS) TECALCO, new species.

Plate 45, fig. 4.

Shell broadly elongate conic, milk white. Nuclear whorls $2\frac{1}{2}$, well rounded, forming a decidedly depressed helicoid spire, having its axis at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Postnuclear whorls flattened in the middle, weakly rounded at the summit, marked by very regular,

well-rounded, narrow, almost straight, slightly protractive axial ribs, of which 18 occur upon all the turns. Intercostal spaces about $2\frac{1}{2}$ times as wide as the ribs, crossed by 9 incised spiral lines, of which the third and ninth are equal, and fully doubly as wide as the second, fourth, and eighth, which are also equal, the rest being well-incised, slender striations. In spacing the first is about as far anterior to the summit as it is distant from the second, and the second is an equal distance from the third; the third, fourth, eighth, and ninth have about the same spacing, while the space between the fourth and fifth and seventh and eighth is only about one-half as wide, the combined spaces between the fifth and seventh are about equal to one of the spaces of the last-mentioned group, the sixth spiral giving a little wider spacing to the area between the fifth and sixth than the sixth and seventh. Suture moderately constricted. Periphery of the last whorl obtusely angulated. Base short, well rounded, marked by the feeble continuations of the axial ribs, which become evanescent on its middle, and nine very slender and almost equally spaced, incised lines. Aperture subquadrate. Posterior angle obtuse (outer lip badly fractured); inner lip very thick and provided with a strong oblique fold a little anterior to its insertion; parietal wall glazed with a thin callus.

The type, an adolescent specimen, Cat. No. 268731, U.S.N.M., was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678 off Redondo Point, Magdalena Bay, Lower California, in $13\frac{1}{2}$ fathoms, on broken-shell bottom. It has $7\frac{1}{2}$ postnuclear whorls and measures—length, 3.9 mm.; diameter, 1.25 mm. Cat. No. 267743, U.S.N.M., contains an adult specimen dredged in shallow water in Santa Maria Bay, Lower California, which has lost the nucleus and probably the first three postnuclear turns, the $7\frac{1}{2}$ remaining measure—length, 5.3 mm.; diameter, 1.8 mm.

TURBONILLA (PYRGISCUS) CORSOENSIS, new species.

Plate 45, fig. 8.

Shell elongate conic, pale yellowish brown. Nuclear whorls $2\frac{1}{2}$, well rounded, forming a very depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns in the first of which it is about one-fourth immersed. Postnuclear whorls flattened in the middle, slightly shouldered at the summit, marked by rather low, narrow, well-rounded, slightly retractively slanting axial ribs, of which 18 occur upon the first, 16 upon the second to fourth, and 18 upon the remaining turns. The ribs become slightly flattened and enfeebled toward the summit. Intercostal spaces about $2\frac{1}{2}$ times as wide as the ribs crossed by nine almost equally spaced incised spiral grooves, the first of which is about as far anterior to the summit as that is

distant from the second. Of these lines the first and second are the weakest, while the fourth and ninth are the strongest, the rest being intermediate. In addition to this sculpture there are many fine incremental lines and equally fine spiral striations on the spire which give the surface a fine clothlike texture. Suture well impressed. Periphery of the last whorl well rounded. Base short, strongly rounded, marked by the feeble continuations of the axial ribs, which become evanescent before reaching its middle, and eight almost equal and equally spaced incised spiral lines. Aperture broadly oval; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip almost straight, oblique, somewhat revolute, and provided with a strong fold a little anterior to its insertion; parietal wall covered with a thick callus.

The type and four additional specimens, Cat. No. 267722a, U.S.N.M., were dredged in shallow water in Santa Maria Bay, Lower California. The type has $9\frac{1}{2}$ postnuclear whorls and measures—length, 6.1 mm.; diameter, 1.7 mm. Cat. No. 268730, U.S.N.M., contains another specimen dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678 off Redondo Point, Magdalena Bay, Lower California.

TURBONILLA (PYRGISCUS) BAEGERTI, new species.

Plate 45, fig. 2.

Shell elongate conic, light yellow horn colored. Nuclear whorls $2\frac{1}{2}$, well rounded, forming a decidedly depressed helicoid spire, the axis of which is at right angles to that of the succeeding whorls, in the first of which the tilted edge of the nucleus is about one-fifth immersed. Postnuclear whorls flattened, slopingly shouldered toward the summit, marked by distinctly spaced, well-rounded, very regular, slightly retractively slanting axial ribs of which 18 occur upon the first five and 20 upon the remaining turns. These ribs become decidedly enfeebled and somewhat flattened toward the summit. Intercostal spaces about twice as wide as the ribs crossed by 12 incised spiral lines of which the first to fourth, and the sixth, ninth, and tenth are mere striations while the fifth, seventh, eighth, eleventh, and twelfth are subequal and much stronger. The widest space is between the tenth and eleventh line, the rest of the spacing is subequal, excepting the first four lines below the summit, which are a little more closely crowded. Suture strongly constricted. Periphery of the last whorl well rounded. Base short, well rounded, marked by the feeble continuation of the axial ribs which become evanescent before reaching the middle of the base and 16 rather closely crowded finely incised spiral lines, the first of which is considerably anterior to the first series of supraperipheral pits. Aperture large, broadly

oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; inner lip stout, slightly curved and somewhat revolute, provided with a moderately strong oblique fold a little anterior to its insertion. Parietal wall covered with a thin callus.

The type, Cat. No. 267744a, U.S.N.M., was collected in shallow water in Santa Maria Bay, Lower California. It has nine post-nuclear whorls and measures—length, 4.8 mm.; diameter, 1.4 mm.

TURBONILLA (PYRGISCUS) ULLOA, new species.

Plate 43, fig. 4.

Shell elongate conic, yellowish white. Nuclear whorls and all but the last $5\frac{1}{2}$ postnuclear turns decollated. The whorls remaining are flattened, almost appressed at the summit, marked by 18 quite regular, slightly protractively slanting, well-rounded axial ribs. Intercostal spaces shallow, about two times as wide as the ribs, crossed by eight incised spiral grooves, of which the second, third, seventh, and eighth are of equal width and much stronger than the rest; the remaining four are also of equal width, but only about one-fourth as wide as the rest. The spaces between the first and second and second and third are equal and almost doubly as wide as those between the summit and the first, the third and fourth, and sixth and seventh; the space between the seventh and eighth is a trifle narrower than the last mentioned, and those between the fourth and fifth and fifth and sixth are a little less wide than this. Suture moderately constricted. Periphery of the last whorl well rounded. Base moderately long, well rounded, marked by the feeble continuations of the axial ribs, which become evanescent before reaching the middle of the base, and 11 strongly incised subequally spaced lines. These is a broad smooth band below the periphery equal to the space between the first and second incised line on the spire of the last whorl. Aperture broadly oval, posterior angle acute; outer lip thin, showing the external sculpture within; inner lip slender, very oblique, and decidedly revolute, provided with a moderately strong fold immediately below the insertion; parietal wall covered by a thick callus.

The type, Cat. No. 267744e, U.S.N.M., was dredged in shallow water in Santa Maria Bay, Lower California. It consists of a little more than the last five whorls and measures—length, 4 mm.; diameter, 1.2 mm.

TURBONILLA (PYRGISCUS) CABRILLOI, new species.

Plate 45, fig. 3.

Shell broadly elongate conic, pale yellow horn colored. Nuclear whorls $2\frac{1}{2}$, well rounded, forming a decidedly depressed helicoid spire having its axis at right angles to that of the succeeding whorls, in the first of which the tilted edge is about one-fourth immersed.

Postnuclear whorls strongly roundly shouldered at the summit, flattened in the middle, crossed by strong sublamellar, slightly protractively slanting axial ribs, of which 16 occur upon the first and second and 18 upon the remaining turns, excepting the last, which has 20. Intercostal spaces about one and one-half times as wide as the ribs, crossed by 11 incised spiral lines, of which the first three are mere striations, while the fourth and the peripheral are wider than the rest, which are about half their width. Suture rather strongly constricted. Periphery of the last whorl well rounded. Base short, narrowly umbilicated, marked by the feeble continuations of the axial ribs, which become evanescent before reaching the middle of the base and seven equal incised spiral lines, of which the first three occupy about as much space as that separating the third from the fourth; the rest become successively closer spaced anteriorly. The space between the first basal line and the peripheral pit is a very broad smooth band. Aperture very broadly oval; posterior angle acute; outer lip thin, showing the external sculpture within; inner lip thin, slightly curved and somewhat revolute, provided with a weak oblique fold at its insertion; parietal wall covered with a thick callus.

The type, Cat. No. 268733 U.S.N.M., was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678 off Redondo Point, Magdalena Bay, Lower California, in $13\frac{1}{2}$ fathoms, on broken-shell bottom. It has $9\frac{1}{4}$ postnuclear whorls and measures—length, 5.5 mm.; diameter, 1.6 mm.

TURBONILLA (CINGULINA) URDENETA, new species.

Plate 45, fig. 1.

Shell elongate-conic, yellowish white, semi-translucent. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns above which only the tilted edge of the last volution projects. Postnuclear whorls well rounded, the first smooth, the second with 2, and the next three with 3 spiral keels, while the rest have 4 between the summit and the suture. The summits of the whorls are feebly shouldered; the first spiral keels fall on the anterior termination of the posterior third of the whorls between the summit and the suture, the space between the summit and this keel being concave. The second and third keels are as strong as the first and are separated from each other by a space a little more than half the width of that between the first and the summit, while the fourth keel is separated from the third by only half that space. The entire surface of the spire, excepting the summit of the keels is crossed by numerous closely spaced very slender axial threads and microscopic spiral striations. Suture strongly constricted. Periphery well rounded.

Base moderately long, well rounded, marked by the fine axial incremental threads, and closely spaced, fine, wavy, spiral striations. Aperture broadly oval, somewhat effuse anteriorly; posterior angle acute; outer lip thin showing the external sculpture within and rendered sinuous at the edge by the strong markings; inner lip very slender, strongly curved, reflected over, and appressed to the base for half its length; parietal wall covered by a thin callus.

The type, and 42 specimens, Cat. No. 267740, were dredged in shallow water in Santa Maria Bay, Lower California. The type has $8\frac{1}{2}$ postnuclear whorls and measures—length, 5.7 mm.; diameter, 1.5 mm. Cat. No. 266536 U.S.N.M. contains another specimen dredged in shallow water in Magdalena Bay, Lower California, and Cat. No. 268640 U.S.N.M. contains three dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678, off Redondo Point, Magdalena Bay, Lower California, in $13\frac{1}{2}$ fathoms on broken shell bottom.

TURBONILLA (MORMULA) SEBASTIANI, new species.

Plate 42, fig. 9.

Shell large, elongate-conic, pale brown. Nuclear whorls $2\frac{1}{2}$, decidedly depressed helicoid, having their axis at right angles to that of the succeeding turns, in the first of which the tilted edge is about one-fourth immersed. Postnuclear whorls well rounded, almost appressed at the summit, crossed by well-rounded, sublamellar, slightly protractively slanting axial ribs, of which 18 occur upon the first, 16 upon the second to seventh, 18 upon the eighth to tenth, and 20 upon the remaining turns. In addition to the axial ribs the whorls are marked at irregular intervals by rather ill-defined varices. Intercostal spaces about three times as wide as the ribs crossed by 14 incised spiral lines, of which the fourth, sixth, and fourteenth are equal and much stronger than the rest. These are followed by the second, eighth, eleventh, and thirteenth, which are also of equal width but only about half as wide. The rest are also subequal and about half as strong as the last named series. Suture moderately constricted. Periphery obscurely angulated. Base short, well-rounded, marked only by incremental lines and eight strong, incised, spiral lines which decrease successively in spacing from the periphery anteriorly. Aperture small, subquadrate; posterior angle obtuse; outer lip very thick, reenforced within by three spiral lamellae of which the posterior two are very strong while the anterior one is feeble. The median fold is about opposite the periphery of the last whorl, while the posterior divides the space between this and the posterior angle of the aperture in two equal parts. The anterior is a trifle farther from the median than that is from the posterior fold. Inner

lip very thick, almost straight, provided with an obscure, very oblique fold a little anterior to its insertion; parietal wall glazed by a thin callus.

The type Cat. No. 268634 U.S.N.M. was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678, off Redondo Point, Magdalena Bay, Lower California. It has 14 postnuclear whorls and measures—length, 10 mm.; diameter, 2 mm.

UGARTEA, new subgenus.

Turbonillas with a fold on the parietal wall.

Type.—*Turbonilla* (*Ugarteia*) *juani* Bartsch.

TURBONILLA (UGARTEA) JUANI, new species.

Plate 43, fig. 5.

Shell broadly elongate conic, bluish white. Nuclear whorls at least 2, planorboid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are about half immersed. Postnuclear whorls appressed at the summit with a strong sloping shoulder, which extends over the posterior fourth of the space between the summit and the suture, the rest flattened; marked by strong, rounded, distantly spaced, almost vertical, axial ribs of which 14 occur upon the first and 12 upon all the remaining, excepting the last, which has 14. The ribs form cusps at the anterior angle of the shoulder, anterior to which they become enfeebled. Intercostal spaces shallow, about $2\frac{1}{2}$ times as wide as the ribs, marked by closely spaced microscopic spiral striations only. Immediately behind the aperture on the last turn the ribs become obsolete. Suture moderately impressed. Periphery of the last whorl rounded. Base prolonged, marked by the continuation of the axial ribs, which become evanescent before reaching the middle. Aperture narrowly oval; posterior angle acute; outer lip thick within, provided with three lamellar denticles on the inner surface; inner lip short, strong decidedly revolute continuing posteriorly into the very strong parietal callus, which becomes disjunct from the preceding whorl at the outer edge, which renders the peritreme complete. The inner lip is provided with a strong oblique fold at its insertion, while the parietal wall bears a short fold about halfway between this and the posterior angle of the aperture.

The type and another specimen, Cat. No. 268638, U.S.N.M., were collected by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678, off Redondo Point, Magdalena Bay, Lower California in $13\frac{1}{2}$ fathoms on broken shell bottom. The type has seven postnuclear whorls and measures—length, 4.2 mm.; diameter, 1.3 mm.

TURBONILLA (MORMULA) VISCAINOI, new species.

Plate 43, fig. 3.

Shell elongate-conic, yellowish-white. Nuclear whorls two, well rounded, forming a moderately elevated helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which the tilted edge is about one-third immersed. Postnuclear whorls well rounded, almost appressed at the summit, crossed by strong, low, well-rounded, distantly spaced, protractive axial ribs, of which 14 occur upon the first and second, 16 upon the third to sixth, and 18 upon the remaining turns. In addition to the ribs the whorls are marked at irregular intervals by rather strong varices. Inter-costal spaces about three times as wide as the ribs, crossed by five spiral pits, which, if the second were a little more anterior, would divide the space between the summit and the fifth pit, which is at the periphery, into five equal spaces. The spaces between these slender pits are crossed by many very fine spiral striations, of which there are about 13 between the summit and the first pit, 5 between the first and second, 9 between the second and third, 11 between the third and fourth, and 6 between the fourth and peripheral pit. Suture moderately constricted. Periphery of the last whorl well rounded, base short, well rounded, marked by the feeble continuations of the axial ribs, which become evanescent before reaching the middle of the base and many fine wavy spiral striations which agree with those on the spire in strength and spacing. Aperture short, subquadrate, posterior angle obtuse; outer lip thin, showing the external sculpture within, reenforced within by four slender spiral lamellæ, two of which are anterior and two posterior to the periphery; inner lip slightly flexuose, almost straight, and somewhat revolute; parietal wall glazed with a very thin callus.

The type Cat. No. 268734 U.S.N.M. was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678, off Redondo Point, Magdalena Bay, Lower California, in $13\frac{1}{2}$ fathoms on broken shell bottom. The type has nine postnuclear whorls and measures—length, 4.3 mm.; diameter, 1.2 mm.

ODOSTOMIA (CHRYSALLIDA) TARAVALI, new species.

Plate 46, fig. 3.

Shell elongate-conic, semitransparent, bluish white. Nuclear whorls, at least 2, well rounded, forming a planorboid spire, the axis of which is almost at right angles to that of the succeeding turns, in the first of which the nuclear spire is about half obliquely immersed. Postnuclear whorls flattened, narrowly, tabulatedly shouldered at the summit, marked by strong, well-rounded, retractive axial ribs, of

which 18 occur upon the first and 16 upon the remaining whorls, except the last, which has 20. These ribs pass prominently from the shoulder to the peripheral sulcus. In addition to the axial sculpture the first 4 turns are crossed by 4 equal and equally spaced, flattened spiral cords, which are about as wide as the spaces that separate them. On the rest of the turns the subperipheral cord comes into the suture and on the penultimate whorl forms a well-developed 5-spiral cord on the spire. The spaces enclosed by the axial ribs and spiral cords are deeply impressed oblong pits, while the junction of the ribs and spiral cords form well-rounded tubercles. Suture of the early turns, where the fifth spiral is still below the summit of the succeeding turn, deeply channeled, less so on the later whorls. Periphery of the last turn strongly rounded. Base short, inflated, strongly rounded, marked by nine strong, rounded, spiral cords which are almost equal and as wide as the spaces that separate them. The grooves between these spiral cords are crossed by numerous slender axial riblets. Aperture oval; posterior angle obtuse; outer lip thin rendered sinuous by the external sculpture; inner lip slender, thin, somewhat revolute, provided with a strong oblique fold at its insertion. Parietal wall covered by a thin callus.

The type, Cat. No. 267743*a* U.S.N.M. was dredged in shallow water in Santa Maria Bay, Lower California. It has seven postnuclear whorls and measures—length, 3.8 mm.; diameter, 1.3 mm.

Another specimen, Cat. No. 268635 U.S.N.M. was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 5678, off Redondo Point, Magdalena Bay, Lower California, in 13½ fathoms, on broken shell bottom.

ODOSTOMIA (CHRYSALLIDA) SANTAMARIENSIS, new species.

Plate 46, fig. 1.

Shell stout, oval, yellowish white. Nuclear whorls decollated, the pit left in the apex of the type shows that it must have been strongly immersed in the first of the postnuclear turns. Postnuclear whorls strongly rounded, feebly shouldered at the summit, marked by rather slender axial ribs, of which 20 occur upon all the turns. In addition to the axial ribs the whorls are marked by 5 spiral cords, which are a little stronger than the ribs. The cords are about as wide as the spaces that separate them, their junctions with the ribs form rounded tubercles, while the spaces inclosed between them are strongly impressed concaved pits. Suture not channeled. Base rather long, somewhat inflated, well rounded, marked by 10 strong spiral cords, which decrease in size gradually and regularly from the periphery to the umbilical chink. The grooves between these spiral cords, which are about equal to the cords in width, are armed by

numerous slender axial riblets. Aperture oval, decidedly effuse anteriorly; posterior angle acute; outer lip thin, rendered wavy at the edge by the external sculpture; inner lip long, oblique, curved, somewhat revolute, provided with a strong oblique fold at its insertion; parietal wall covered by a moderately thick callus.

The type, Cat. No. 266180, U.S.N.M., was dredged in shallow water in Santa Maria Bay, lower California. It has $4\frac{1}{2}$ postnuclear whorls and measures, length, 3.5 mm.; diameter, 1.9 mm.

ODOSTOMIA (EVALEA) VALEROI, new species.

Plate 46, fig. 7.

Shell ovate, narrowly umbilicated, thin, bluish white. Nuclear whorls small, completely, deeply, obliquely immersed in the first of the succeeding turns. Postnuclear whorls inflated, strongly rounded, appressed at the summit, crossed by numerous very fine, closely spaced spiral striations. Suture moderately constricted. Periphery of the last whorl inflated, well rounded. Base short, inflated, strongly rounded, narrowly umbilicated. Aperture broadly oval; posterior angle obtuse; outer lip thin, protracted between the summit and periphery to form a claw-like element; inner lip decidedly curved, slender, and somewhat revolute, provided with a strong oblique fold at its insertion; parietal wall glazed with a thin callus.

The type and another specimen, Cat. No. 266545, U.S.N.M., were dredged in shallow water in Magdalena Bay, lower California. The type has five postnuclear whorls and measures, length, 3 mm; diameter, 1.7 mm. Six additional specimens, Cat. No. 267754, U.S.N.M., were dredged in shallow water in Santa Maria Bay, lower California.

ODOSTOMIA (EVALEA) FRANCISCANA, new species.

Plate 45, fig. 7.

Shell thin, broadly elongate conic, yellowish white. Nuclear whorls small, deeply embedded in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Postnuclear whorls inflated, well rounded, feebly shouldered at the summit, marked by almost vertical, very feeble, incremental lines and exceedingly fine, closely spaced, spiral striations. Suture moderately constricted. Periphery of the last whorl very feebly angulated. Base short, inflated, well rounded, with a very narrow umbilical chink. Aperture large; posterior angle acute; outer lip thin; inner lip strongly curved, somewhat reflected and provided with a strong, oblique fold at its insertion; parietal wall glazed with a thin callus.

The type and three specimens, Cat. No. 214431, U.S.N.M., were collected at United States Bureau of Fisheries Station 5729, in San

Francisco Bay, on sticky, nearly black, mud in $4\frac{3}{4}$ fathoms. Cat. No. 214432, U.S.N.M., contains four additional specimens, also from San Francisco Bay, dredged at U. S. Bureau of Fisheries Station 5781, on coarse sand, pebbly and shell bottom, in $9\frac{3}{4}$ to 16 fathoms.

ODOSTOMIA (EVALEA) WILLETTI, new species.

Plate 43, fig. 6.

Shell large, elongate conic, bluish white. Nuclear whorls obliquely immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Postnuclear whorls moderately rounded, appressed at the summit, the early ones marked by a moderate number of strongly incised lines, while on the later whorls the incised spiral lines are finer and much more numerous, in addition to the spiral sculpture the whorls are marked by decidedly retractively slanting, incremental lines. Suture moderately constricted. Periphery of the last whorl inflated, feebly angulated. Base attenuated, moderately rounded. Aperture oval, somewhat effuse anteriorly; posterior angle acute; outer lip thin; inner lip very oblique, stout, slightly curved, reflected over and appressed to the base, provided with a strong oblique fold at its insertion; parietal wall covered with a thick callus.

The type, Cat. No. 274007, U.S.N.M., was dredged by Mr. G. Willett, at Waterfall Cannery, west side of Prince of Wales Island, Alaska. It has almost seven postnuclear whorls and measures—length, 5.8 mm.; diameter, 2.4 mm. Another specimen from the same locality is in Mr. Willett's collection.

ODOSTOMIA (EVALEA) PLEIOREGONA, new species.

Plate 42, fig. 5; plate 45, fig. 6.

Shell broadly conic, white. Nuclear whorls deeply immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Postnuclear whorls flattened, appressed at the summit, all of them marked by very fine, closely spaced, spiral striations and decidedly retractively slanting, fine incremental lines. Suture moderately impressed. Periphery of the last whorl inflated, obtusely angulated. Base short, well rounded. Aperture large, slightly effused anteriorly; posterior angle acute; outer lip thin; inner lip oblique, slightly revolute, and appressed to the base for its posterior half and provided with a strong, oblique fold at its insertion; parietal wall covered with a thick callus.

The two cotypes, Cat. No. 252430, U.S.N.M., were collected by Harold Hannibal in the upper Pliocene, Elk River beds, at the mouth of Elk River, near Port Orford, Oregon. One of these is a young

specimen, having five postnuclear whorls, which measures—length, 3.6 mm.; diameter, 2.1 mm. The other is an adult, having three and one-fifth postnuclear whorls, and measures—length, 4.8 mm.; diameter, 2.8 mm.

I confused this species previously with *Odostomia (Evalea) stephensi* Dall and Bartsch, which is a recent form, but additional material of *O. stephensi* makes it necessary to change my opinion and requires that this be described as new.

ODOSTOMIA (EVALEA) ORFORDENSIS, new species.

Plate 43, fig. 2.

Shell small, oval. Nuclear whorls decollated. Postnuclear whorls appressed at the summit, well rounded, marked by slightly retractorily slanting, incremental lines and exceedingly fine spiral striations. Suture moderately constricted. Periphery of the last whorl well rounded. Base moderately long, well rounded. Aperture oval; posterior angle acute; inner lip curved and appressed to the base; parietal wall covered with a thick callus.

The type, Cat. No. 252431, U.S.N.M., was collected by Harold Hannibal in the upper Pliocene, Elk River bed, at the mouth of Elk River, at Port Orford, Oregon. It consists of the last three and one-half postnuclear whorls and measures—length, 3 mm.; diameter, 1.6 mm.

This form I had previously identified as *Odostomia (Evalea) valensi* Dall and Bartsch, which is a recent form, but additional material makes it possible to determine the limits of variation of it and also requires that this shell be given a distinct name.

ODOSTOMIA (EVALEA) ANDERSONI, new name.

Eulimella californica ANDERSON and MARTIN, Proc. Cal. Acad. Sci., 1914, p. 67, pl. 7, figs. 19a, 19b, and 19c, not *Odostomia (Evalea) californica* Dall and Bartsch, Bull. 68, U. S. Nat. Mus., 1909, pp. 20-25.

This is an *Odostomia* belonging to the subgenus (*Evalea*); the name *californica* being preoccupied makes the new name necessary. The specimens were collected in the Lower Miocene in the bottom of a small canyon, about 1½ miles due north of Barker's ranch house, Kern County, California.

The type No. 141 and cotype No. 142 are in the California Academy of Sciences. The type measures—length, 4.5 mm.; diameter, 2 mm.

ODOSTOMIA (ODOSTOMIA) ORCUTTI, new species.

Plate 46, fig. 8.

Shell minute, pupoid, pale brown, marked by retractorily slanting, incremental lines only. Nuclear whorls deeply immersed in the first

of the succeeding turns. Postnuclear whorls slightly rounded and appressed at the summit, the summit of the last one dropping some little distance below the periphery of the preceding whorl gives to the penultimate whorl an overhanging aspect. Suture moderately impressed. Periphery of the last whorl slightly inflated. Base moderately long, strongly rounded, with a narrow umbilical chink. Aperture oval; outer lip thin; inner lip slightly curved, strongly reflected, and provided with a very strong, oblique fold a little anterior to its insertion; parietal wall covered with a moderately thin callus.

The type, Cat. No. 274006, U.S.N.M., was dredged by C. R. Orcutt near the foot of Broadway in San Diego Bay, California. It has four and one-fifth postnuclear whorls and measures—length, 1.5 mm.; diameter, 0.8 mm.

The minute size and pupoid shape distinguish the shell at once from any of the Western American *Odostomias*.

CERITHIOPSIS (CERITHIOPSIS) CHARLOTTENSIS, new species.

Plate 46, figs. 9, 11.

Shell elongate conic, pale brown. Nuclear whorls strongly rounded, three, forming a slender very elevated spire, smooth. Postnuclear whorls well rounded, appressed at the summit, marked by rather strong, almost vertical axial ribs of which 14 occur upon the first four turns, 16 upon the fifth, 18 upon the sixth, and 20 upon the penultimate whorl. Intercostal spaces a little wider than the ribs. The spiral sculpture consists of three strong cords, of which the one at the summit is a little less strong than the other two. The junction of the spiral cords and the axial ribs form strong tubercles, those on the cord at the summit are well rounded, while those of the median cord are truncated anteriorly and posteriorly. The tubercles of the third cord are truncated posteriorly and sloped gently anteriorly. The spaces inclosed between the spiral cords and the axial ribs are well-rounded pits. Suture moderately constricted. Periphery of the last whorl marked by a spiral groove, which equals in strength and width the groove that separates the median from the third cord on the spire. Base short, well rounded, smooth, excepting the exceedingly fine incremental lines and microscopic spiral striations which are also present on the spire and a very slender basal fasciole which surrounds the insertion of the inner lip. Aperture decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within, decidedly sinuous at the edge; inner lip rendered decidedly flexuose; parietal wall covered by a thin callus.

The type and three paratypes, Cat. No. 225185, U.S.N.M., were collected by the U. S. Bureau of Fisheries steamer *Albatross*, at station 4205, in 60 fathoms, on mud bottom; bottom temperature 47.6° in Queen Charlotte Sound, British Columbia. The type, which has lost the first 2 nuclear whorls, has $7\frac{1}{2}$ postnuclear turns and measures—length, 5 mm.; diameter, 1.7 mm. The nuclear whorls were described from one of the paratypes.

CERITHIOPSIS (CERITHIOPSIS) GRIPPI, new species.

Plate 46, fig. 12.

Shell of medium size, chestnut brown. Nuclear whorls $4\frac{1}{2}$, smooth, well rounded, forming a moderately elevated apex, which is transparent. Postnuclear whorls narrowly shouldered at the summit, moderately rounded in the middle, decidedly contracted from the last spiral cord to the suture, marked by slender, slightly retractive axial ribs, of which 14 occur on the first, 16 upon the second and third, 18 upon the fourth and fifth, and 20 upon the remaining turns. Intercoastal spaces about half as wide as the ribs. In addition to this axial sculpture, the whorls are marked by three strong spiral cords, of which the one at the summit is a trifle weaker than the other two. The junction of the axial ribs and the spiral cords form very prominent, well rounded tubercles, of which those on the first and median cords are well rounded, while those on the third cord are truncated posteriorly and sloped gently anteriorly. The spaces inclosed between the cords and the axial ribs are well-rounded, well-impressed pits. Suture almost channeled. Periphery of the last whorl marked by a broad groove, which is a little wider than the groove between the median and the third cord. The axial ribs extend across this groove, but stop at its anterior limit. Base short, well rounded, marked by 2 strong spiral grooves, of which one is on the median part, while the other encircles the insertion of the inner lip. The entire surface of the spire and the base is marked by very fine incremental lines and much finer spiral striations. Aperture of irregular shape, decidedly channeled anteriorly; posterior angle very obtuse; outer lip somewhat effuse, rendered decidedly sinuous at the edge by the external sculpture; columella very strong; inner lip reflected and appressed to the columella. Parietal wall covered by a thin callus.

The type and another specimen, Cat. No. 250632, U.S.N.M., were collected by Mr. Gripp, in 15 fathoms, outside of kelp, off San Diego Bay, California. The type has $8\frac{1}{2}$ postnuclear whorls and measures—length, 4.7 mm.; diameter, 1.2 mm. Two additional specimens in Mr. Gripp's collection were examined.

CERITHIOPSIS (CERITHIOPSIS) BAKERI, new species.

Plate 46, fig. 10.

Shell of medium size, chestnut brown. Nuclear whorls $3\frac{1}{2}$, well rounded, smooth, forming a styliform apex. Postnuclear whorls well rounded, narrowly, tabulatedly shouldered at the summit, and decidedly contracted anterior to the third keel, marked by rather slender axial ribs, of which 18 occur upon the first to fourth, 20 upon the fifth, 22 upon the sixth, and 24 upon the last turn. Inter-costal spaces about $1\frac{1}{2}$ times as wide as the ribs. In addition to the axial sculpture the whorls are marked by three strong spiral keels of which the first, which is considerably weaker than the rest, is at the summit. These keels are about as wide as the spaces that separate them and are much stronger than the axial ribs. The junctions of the axial ribs and the spiral keels form tubercles. The tubercles on the first keel are well rounded, while those on the second and third are truncated posteriorly and slope gently anteriorly. Periphery of the last whorl marked by a deep spiral groove which is as wide as that separating the median from the third keel. This groove is crossed by the continuations of the axial ribs which stop at the anterior termination of the groove. Suture strongly channeled. Base moderately long, slightly concave, marked by a very strong spiral keel immediately anterior to the peripheral groove. The anterior border of this keel is limited by a slender incised line. A second low, weakly developed spiral cord encircles the middle of the base between the basal fasciole, which is a mere slender thread at the insertion of the columella, and the keel immediately anterior to the periphery. Aperture of irregular shape, decidedly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered sinuous at the edge by the strong external sculpture; inner lip decidedly flexuose, reflected over and adnate to the base; parietal wall covered with a moderately thick callus.

The type, Cat. No. 223049, U.S.N.M., was collected by Dr. Fred Baker in 7-10 fathoms, south of Coronado Island, California. It has $7\frac{1}{2}$ postnuclear whorls and measures—length, 4.2 mm.; diameter, 1.5 mm.

CERITHIOPSIS (CERITHIOPSIS) HELENA, new species.

Plate 46, fig. 2.

Shell very small. Nuclear whorls $4\frac{1}{2}$, light yellow, slightly rounded, separated by a moderately constricted suture forming an acicular apex. Postnuclear whorls chestnut brown, excepting the first keel which is white on all the whorls, tabulatedly shouldered at the summit, moderately rounded and strongly constricted below the

third spiral keel, marked by rather feeble axial ribs, which are slightly retractive. Of these ribs, 16 occur upon the first and second, 18 upon the third, 20 upon the fourth, and 24 upon the penultimate whorl. The spiral sculpture consists of three strong keels which are a little wider than the spaces that separate them and considerably wider than the axial ribs. The first of these is at the summit, the second one midway between the first and third, while the third is a little posterior to the suture. The junction of the axial ribs and spiral keels renders the spiral keels tubercular. The tubercles on the first cord are oval with their long axis corresponding to the axial sculpture. The tubercles on the median cord are truncated both anteriorly and posteriorly, but sloped a little more gently anteriorly, while the tubercles on the third cord are truncated abruptly posteriorly and gently anteriorly. Suture narrowly channeled. Periphery of the last whorl marked by a deep spiral sulcus, which is as wide as that separating the third from the median cord on the spire. This groove is crossed by the continuations of the axial rib which terminate at its anterior margin. Base moderately long, marked by a strong spiral keel immediately anterior to the peripheral sulcus, and another a little less strong in the middle of the space between the insertion of the columella and this keel. This middle keel is bordered on each side by a deep sulcus. In addition to this, the entire spire and base also bear exceedingly fine spiral striations and incremental lines. Aperture of irregular outline, decidedly channeled anteriorly; posterior angle obtuse; outer lip thick within, thin at the edge where it is rendered sinuous by the external sculpture; columella very stout, almost vertical; inner lip moderately strong, reflected over and adnate to the base; parietal wall covered with a thick callus which renders the peritreme complete.

The type, Cat. No. 204128, U.S.N.M., was collected by the U. S. Bureau of Fisheries steamer *Albatross*, on the shores of Panama Bay. It has six postnuclear whorls and measures—length, 2.9 mm.; diameter 1.0 mm.

CERITHIOPSIS OROVILLENIS Dickerson.

Cerithiopsis orovillensis DICKERSON, Bull. Dept. Geol. Univ. Cal., vol. 9, No. 17, 1916, p. 489, pl. 39, fig. 7.

The type comes from the Eocene Tejon formation at the University of California locality 2225, south side of Oroville, South Table Mountain. It has nine whorls and measures—length, 6 mm.; diameter, 2 mm.

CERITHIOPSIS (CERITHIOPSIS) DUMBLEI Dickerson.

Cerithiopsis dumblei DICKERSON, Bull. Dept. Geol. Univ. of Cal., vol. 9, No. 17, 1916, p. 489, pl. 38, fig. 12.

The figured type has nine whorls; the specimen measures, length, 9.5 mm.

It was collected in the Eocene Tejon formation at the University of California locality 672, SE. $\frac{1}{4}$ of NW. $\frac{1}{4}$ sec. 24, Parson's Peak, in Tejon white sandstone, 0 to 10 feet below white shale.

CERITHIOPSIS OREGONENSIS Dickerson.

Cerithiopsis oregonensis DICKERSON, Proc. Cal. Acad. Sci., ser. 4, vol. 4, 1914, p. 121, pl. 11, figs. 5, 5a.

The type of this species, No. 246, California Academy of Sciences, comes from the Eocene, locality 25, Roseburg Quadrangle, Oregon, near the center of sec. 19, T. 26 S., R. 3 W., on the east bank of Little River at its confluence with the Umpqua, underneath the bridge at that point. It measures—length, 20 mm.; diameter, 4.5 mm.

CERITHIOPSIS BOLINGERENSIS Clark.

Cerithiopsis bolingerensis CLARK, Bull. Dept. Geol. Univ. Cal., vol. 8, 1915, pp. 490, 491, pl. 65, fig. 25.

This species comes from the Miocene Upper San Pablo of Las Trampas Ridge, University of California locality 1182. It is said to have seven or eight whorls and measures about 8 mm. in length.

CERITHIOPSIS TURNERI Clark.

Cerithiopsis turneri CLARK, Bull. Dept. Geol. Univ. Cal., vol. 8, 1915, p. 490, pl. 65, figs. 1, 2.

This specimen comes from the Miocene, in the Lower San Pablo group at Kirker Pass, University of California locality 100.

The type is said to have 10 to 11 whorls and measures—length, about 15 mm.; diameter, 4 mm.

BITTIUM BARTOLOMENSIS, new species.

Plate 47, fig. 5.

Shell stout, very broadly conic, with deeply channeled suture, the posterior half between the summit and suture of each whorl and the posterior half of the base brown, the rest white. Nuclear whorls decollated. Postnuclear turns marked by broad, rounded axial ribs, of which 16 occur upon the second to fifth, 18 upon the sixth, and 20 upon the last turn. These ribs extend strongly from the rather prominent shoulder at the summit to the suture. The spiral sculpture consists of four equally strong and equally spaced cords, which are about as wide as the spaces that separate them. On the last two turns a slender intercalated spiral thread appears between the second and third and the third and fourth cords. The junction of the axial ribs and spiral cords form quite strong well-rounded tubercles, while the spaces inclosed by them are rather deep concave pits except where they are divided by the intercalated threads. Suture strongly

constricted, channeled. Periphery of the last whorl rendered angulated by a cord, the groove between which and the fourth cord of the spire is crossed by two slender spiral threads. Base short, concave in the middle, marked by seven subequal and subequally spaced low rounded spiral cords, which are about as wide as the spaces that separate them, and numerous very fine axial threads which are best shown in the grooves. Aperture oval, slightly protracted and weakly channeled anteriorly; posterior angle obtuse; outer lip thin, rendered sinuous by the external sculpture; inner lip oblique, slightly curved, reflected over and appressed to the base; parietal wall covered by a thin callus.

The type, Cat. No. 266937, U.S.N.M., was dredged in shallow water in San Bartolome Bay, Lower California. It has $7\frac{1}{2}$ post-nuclear whorls and measures—length, 6.6 mm.; diameter, 2.6 mm.

BITTIUM CHALLISAE, new species.

Plate 47, figs. 2, 6.

Shell very large, white. Nucleus and early postnuclear turns decollated, those remaining slightly shouldered at the summit, weakly rounded in the middle and decidedly contracted immediately above the suture, marked by rather strong, low, well-rounded axial ribs of which 14 occur upon the second and third, 16 upon the fourth to sixth, 18 upon the seventh, and 20 upon the last turn. The spiral sculpture consists of four cords on the early whorls, of which the first, at the summit, is a little weaker than the rest. These primary cords are truncated posteriorly and slope gently anteriorly. Beginning with the fourth whorl an intercalated thread makes its appearance between all the cords and between the summit and the first cord. Suture strongly constricted. Periphery of the last whorl rendered angulated by a cord. Base short, slightly concave, marked by five low, broad, well rounded, obsolete cords which are subequal and subequally spaced. Aperture broadly oval, rather strongly channeled anteriorly; posterior angle obtuse; outer lip thin rendered sinuous at the edge by the external sculpture, showing the external markings within; inner lip somewhat sinuous, rather stout, reflected over and appressed to the base; parietal wall covered by a moderately thick callus.

The type and another specimen, Cat. No. 272376, U.S.N.M., were collected by Miss Bertha Challis at San Juan Island, Gulf of Georgia, British Columbia. The type has nine whorls remaining and measures—length, 13 mm.; diameter, 4.2 mm.

BITTIUM SANTAMARIENSIS, new species.

Plate 47, fig. 3.

Shell elongate conic, pale brown. Nuclear whorls decollated. Post-nuclear whorls well rounded, narrowly tabulatedly shouldered at the summit, becoming decidedly contracted between the fourth spiral cord and the suture, marked by narrow, well-rounded, almost vertical axial ribs of which 14 occur upon the first and second, 16 upon the third and fourth, 18 upon the fifth, and 20 upon the last turn. In addition to the axial sculpture, the whorls are marked by four strong spiral cords which are equal and equally spaced, the space between them being as wide as the cords. The first of these cords is at the summit. The junction of these cords and the axial ribs form elongated, well-rounded tubercles, while the spaces between them form rectangular pits, the long axis of which coincides with the spiral sculpture. On the last whorl a slender spiral thread is present in each groove between the raised keels. Periphery marked by a rather strong spiral cord. The space between this and the fourth cord on the spire bears a slender spiral thread. Base moderately long, concave, marked by 8 slender spiral threads which are not quite as broad as the spaces that separate them. Aperture broadly oval, moderately channeled anteriorly; posterior angle obtuse; outer lip thin, rendered sinuous by the spiral sculpture; inner lip oblique, somewhat concave, reflected over and appressed to the base; parietal wall covered by a thin callus.

The type, Cat. No. 268623, U.S.N.M., was collected in shallow water in Santa Maria Bay, Lower California. It has $6\frac{1}{2}$ postnuclear whorls and measures—length, 4.9 m.; diameter, 2 mm.

BITTIUM SANJUANENSIS, new species.

Plate 47, fig. 4.

Shell very large, rather thin, bluish white. Nuclear whorls decollated. Postnuclear whorls almost appressed at the summit, well rounded, decidedly contracted immediately posterior to the suture, marked by strong, broad, heavy, slightly protractive axial ribs which become enfeebled toward the summit and slightly widened there. Of these ribs, 12 occur upon the second and third, 14 upon the fourth and fifth, and 16 upon the last whorl. Intercostal spaces not quite as broad as the ribs. The spiral sculpture consists of five cords, of which the first, which is at the summit, is very slender. The two succeeding this are successively a trifle stronger, while the fourth and fifth are very strong, the last being the heaviest of all. The junction of the axial ribs and the spiral cords form well-rounded, elongated nodules which have their long axis parallel with the spiral

sculpture; the spaces inclosed between them are very shallow, rectangular pits. In addition to the above sculpture the entire surface of the spire and base is marked by many very slender lines of growth and exceedingly fine microscopic spiral striations, the combination of which gives the surface a somewhat cloth-like texture. Suture strongly constricted; it would be channeled were it not for the fact that the peripheral keel makes its appearance above the summit of the whorl, hence removes the strongly channeled element. Periphery of the last whorl marked by strong spiral cord, which is about as far anterior to the fifth cord of the spire as that is separated from the fourth. Base very short, decidedly concave, marked by three slender spiral cords, of which the first is about as far anterior to the periphery as that is distant from the fifth cord on the spire. The other two cords are very slender, the first being at the base of the columella, while the next is a little distance posterior to it. Aperture subquadrate; quite strongly channeled anteriorly; the junction of the outer and basal lip forming almost a right angle; posterior angle obtuse; outer lip very thin, showing the external sculpture within and rendered sinuous by the external sculpture at the edge; inner lip decidedly oblique, slightly curved, slender, reflected and appressed to the base; parietal wall covered by a thin callus.

The type, Cat. No. 168753, U.S.N.M., was collected by Miss Challis off San Juan Island, Gulf of Georgia, British Columbia. It has lost the nuclear turns; $7\frac{1}{2}$ postnuclear whorls remaining measure—length, 11 mm.; diameter, 3.8 mm.

BITTIUM SERRA, new species.

Plate 47, fig. 1.

Shell stout, broadly conic, grayish white. Nuclear whorls decollated. Postnuclear whorls appressed at the summit, strongly rounded, marked by slender, rounded, somewhat retractive axial ribs, of which 18 occur upon the first and second, 20 upon the third, 22 upon the fourth, and 24 upon the remaining turns. In addition to the axial sculpture, the whorls are marked by four spiral cords, of which the first, which is at the summit, is a little weaker than the rest. The junction of these cords with the axial ribs form prominent, strongly rounded tubercles, while the spaces inclosed between them are rounded pits. Suture moderately constricted but not channeled. Periphery of the last whorl rendered angulated by a spiral cord. Base short, slightly concave, marked by four very low, broad, almost equal, spiral cords, which are separated by mere impressed lines. Aperture oval, narrowly, twistedly channeled anteriorly; posterior angle obtuse; outer lip rendered wavy by the external sculpture; inner lip decidedly curved, somewhat revolute, reflected over and appressed to the base; parietal wall covered with a thin callus.

The type, Cat. No. 271076, U.S.N.M., was dredged by the U. S. Bureau of Fisheries steamer *Albatross*, at station 4310, off Point Loma Light, California, in 71 to 75 fathoms, on green mud and fine sand bottom. The type has lost the nucleus and probably the first postnuclear turn; the $6\frac{1}{2}$ remaining measure—length, 6.5 mm.; diameter, 2.6 mm. Cat. No. 268745, U.S.N.M., contains another specimen from San Bartolome Bay, Lower California.

BITTIUM TRAMPASENSIS Clark.

Bittium trampasensis CLARK, Bull. Dept. Geol. Univ. Cal., vol. 8, 1915, pp. 489, 490, pl. 65, figs. 3, 5.

This species occurs in the Miocene, Upper San Pablo group, at University of California locality 118. Two specimens are figured, both incomplete; the measurement given is 8 mm. for the height.

BITTIUM ? PABLOENSIS Clark.

Bittium pabloensis CLARK, Bull. Dept. Geol. Univ. Cal., vol. 8, No. 22, 1915, p. 489, pl. 65, fig. 10.

The unique type came from the Miocene of the San Pablo group of San Pablo Bay. From the description and figure I would unhesitatingly say that this is not a *Bittium*, but I am unwilling to refer it to another group without more evidence. The type is said to have six or seven whorls and to measure—length, about 16 mm.; diameter, 8 mm.

BITTIUM LONGISSIMUM Cooper.

Bittium longissimum COOPER, Bull. 4, Cal. State Min. Bur., 1894, p. 43, pl. 2, fig. 30.

I overlooked this specimen in my paper on The Recent and Fossil Mollusks of the Genus *Bittium* from the West Coast of America.¹

It is a slender specimen of 16 whorls, measuring—length, 12.25 mm.; diameter, 1.55 mm. It was collected by Mr. Watts in the weir at Marysville Buttes. The figure above cited is a wretched one, absolutely unrecognizable. A specimen from the type locality is nicely figured by Dickerson.²

BITTIUM WASHINGTONIANA Dickerson.

Triforis washingtoniana DICKERSON, Cal. Acad. Sci., vol. 5, 1915, p. 63, pl. 6, fig. 13.

This is not a *Triforis*, but a *Bittium*. The No. 362 Cal. Acad. Sci. type has 9 whorls and measures—length, 20 mm.; diameter, 4.5 mm. It comes from the Eocene-Tejon formation locality 183 on the west bank of the Cowlitz River, about one and three-fourths miles southeast of Vadar (Little Falls), Washington.

¹ Proc. U. S. Nat. Mus., vol. 40, 1911, pp. 383-414, pls. 51-58.

² Bull. Dept. Geol. Univ. California, vol. 9, No. 17, 1916, pl. 40, fig. 11.

ALVANIA BARTOLOMENSIS, new species.

Plate 46, fig. 4.

Shell very elongate ovate, pale yellow, slightly mottled and streaked with rust brown. Nuclear whorls $2\frac{1}{2}$, smooth, well rounded. Postnuclear whorls well rounded, appressed at the summit, marked by incised spiral lines which are of somewhat irregular strength and spacing. Of these lines 17 occur between the summit and the periphery of the last whorl. The axial sculpture is reduced to mere lines of growth. Suture moderately constricted, periphery of the last whorl well rounded. Base moderately long, well rounded, marked by incised spiral lines which are of equal strength and spacing. Aperture irregular, decidedly effuse at the junction of the outer and basal lip; slightly channeled anteriorly; posterior angle acute; outer lip thin at the edge, thick within. Inner lip short, thick, slightly curved, reflected over and appressed to the somewhat attenuated base; parietal wall covered with a thick callus, which renders the peritreme complete.

The type, Cat. 268742, U.S.N.M., was collected by the United States Bureau of Fisheries steamer *Albatross*, in shallow water in San Bartolome Bay, Lower California. It has $4\frac{1}{2}$ postnuclear whorls and measures—length, 4.2 mm.; diameter, 1.9 mm.

ALVANIA KYSKAENSIS, new species.

Plate 46, fig. 6.

Shell elongate ovate, pale brownish yellow. Nuclear whorls one and one-half, well rounded, marked by very slender spiral striations and exceedingly fine incremental lines. Postnuclear whorls strongly rounded, weakly shouldered at the summit, marked by slender axial riblets which are somewhat sinuous and slightly retractively slanting. Of these ribs 24 occur upon the first, 26 upon the second, and 40 upon the penultimate turn; these are about one-third as wide as the spaces that separate them. In addition to the axial sculpture, the whorls are marked by four spiral cords, of which the first, which is about as far from the summit as it is distant from the second, is very weak on the first two whorls, but on the last assumes almost the strength of the other three cords. The other three cords are of equal strength and spacing. The junction of the axial ribs and the spiral cords, which are a little stronger than the ribs, form weak nodules, while the spaces inclosed between them appear as well impressed, squarish pits. In addition to this sculpture, the entire surface is marked by very fine incremental lines and numerous microscopic spiral striations, the two lending it a cloth-like texture. Suture strongly constricted. On the last whorl the first basal keel makes its appearance above the summit of the succeeding turn. Periphery of the last whorl marked by a spiral sulcus about as wide as those separating the cords on the spire. Base well rounded, marked by seven equal

and equally spaced low, well-rounded spiral cords, which are a little wider than the spaces that separate them. Aperture subcircular; posterior angle obtuse; outer lip strongly curved, rendered somewhat sinuous by the external sculpture; inner lip strongly curved; parietal wall covered by a thick callus which renders the peritreme almost complete.

The type and three specimens of this species, Cat. No. 271407, U.S.N.M., were collected by Dr. William H. Dall in shallow water at Kyska Harbor, Aleutian Islands, Alaska. The type has $3\frac{1}{2}$ post-nuclear whorls and measures—length, 2.5 mm.; diameter, 1.2 mm.

ALVANIA DINORA, new species.

Plate 46, fig. 5.

Shell small, elongate ovate, yellowish white. Nuclear whorls two, strongly rounded, smooth. Postnuclear whorls strongly rounded, almost appressed at the summit and moderately constricted at the suture, marked by 7 very low, flattened spiral cords between the sutures, which are separated by a shallow impressed line. The axial sculpture consists of numerous very slender threads which are almost vertical. Suture strongly constricted. Periphery of the last whorl somewhat inflated, well rounded, base moderately long, slightly attenuated anteriorly, marked by 6 low, ill-defined rounded spiral cords, which, like those on the spire, are separated by mere impressed lines. The axial ribs also continue over the base. Aperture broadly oval, decidedly effuse at the junction of the basal and the outer lip; posterior angle obtuse; outer lip thick within, thin at the edge, evenly curved from the posterior angle to its junction with the inner lip; inner lip decidedly curved, somewhat reflected and appressed to the base; parietal wall covered by a thick callus, which practically renders the peritreme complete.

The type, Cat. No. 268730, U.S.N.M., and three additional specimens of this species, were collected by Mr. Willis at Forrester Island, Alaska. The type has a little more than 3 postnuclear whorls and measures—length, 2 mm.; diameter, 1 mm.

This is a very small species with very feeble sculpture.

In addition to these new species of *Alvania*, we have seen the additional specimens listed under the species mentioned below since the publication of my little monograph on The Recent and Fossil Mollusks of the Genus *Alvania* from the West Coast of America.¹

It may be well to mention here that recent studies in the classification of the group will make it necessary to redistribute the members which we have brought together under the genus *Alvania* among several groups. I refrain from doing this at this time, because I wish first to examine the type-species of all the supraspecific groups before giving a final opinion.

¹Proc. U. S. Nat. Mus., vol. 41, pp. 333-362, pls. 29-32.

ALVANIA COSMIA Bartsch.

Five specimens, Cat. No. 271497, U.S.N.M., from Todos Santos Bay, California.

ALVANIA ACUTILIRATA Carpenter.

Five specimens, Cat. No. 268741, U.S.N.M., from San Diego, California.

ALVANIA AEQUISCULPTA Keep.

Eleven specimens, Cat. No. 253089, U.S.N.M., from Pacific Beach, California.

ALVANIA COMPACTA Carpenter.

Two specimens, Cat. No. 271002, U.S.N.M., from Netarts Bay, Oregon. Fifteen specimens, Cat. No. 268743, U.S.N.M., from Yakutat Bay, Alaska.

Of *Rissoina* we have seen additional specimens of the following five species:

RISSOINA KELSEYI Dall and Bartsch.

One specimen, Cat. No. 271651, U.S.N.M., from San Diego, California.

RISSOINA HISTIA Bartsch.

One specimen, Cat. No. 211678, U.S.N.M., from La Paz, Gulf of California.

RISSOINA DALLI Bartsch.

One specimen, Cat. No. 268737, U.S.N.M., from San Pedro, California.

RISSOINA NEREINA Bartsch.

One specimen, Cat. No. 268643, U.S.N.M., from San Bartolome Bay, Lower California.

One specimen, Cat. No. 267735, U.S.N.M., from Santa Maria Bay, Lower California.

EXPLANATION OF PLATES.

PLATE 42.

- FIG. 1. *Pyramidella* (*Pharcidella*) *magdalcensis*, new species.
 2. *Turbonilla* (*Pyrgolampros*) *franciscana*, new species.
 3. *Pyramidellida* (*Longchaeus*) *cooperi* Anderson and Martin.
 4. *Turbonilla* (*Strioturbonilla*) *redondocensis*, new species.
 5. *Odostomia* (*Evalca*) *pleioregona*, new species.
 6. *Turbonilla* (*Pyrgiscus*) *ista*, new species.
 7. *Turbonilla* (*Pyrgiscus*) *cortezi*, new species.
 8. *Turbonilla* (*Strioturbonilla*) *barkleyensis*, new species.
 9. *Turbonilla* (*Mormula*) *sebastiani*, new species.
 10. *Turbonilla* (*Pyrgiscus*) *dora*, new species.

PLATE 43.

- FIG. 1. *Turbonilla* (*Pyrgiscus*) *lamna*, new species.
 2. *Odostomia* (*Evalca*) *orfordensis*, new species.
 3. *Turbonilla* (*Mormula*) *viscainoi*, new species.
 4. *Turbonilla* (*Pyrgiscus*) *ulloa*, new species.
 5. *Turbonilla* (*Ugarteia*) *juuni*, new species.
 6. *Odostomia* (*Evalca*) *willetti*, new species.
 7. *Turbonilla* (*Pyrgolampros*) *hannibali*, new species.
 8. *Turbonilla* (*Strioturbonilla*) *schnitti*, new species.

PLATE 44.

- FIG. 1. *Turbonilla* (*Strioturbonilla*) *montezuma*, new species.
 2. *Turbonilla* (*Strioturbonilla*) *santamariana*, new species.
 3. *Turbonilla* (*Strioturbonilla*) *dorcdona*, new species.
 4. *Turbonilla* (*Pyrgolampros*) *puyctensis*, new species.
 5. *Turbonilla* (*Pyrgisculus*) *guilleni*, new species.
 6. *Turbonilla* (*Pyrgiscus*) *eva*, new species.
 7. *Turbonilla* (*Pyrgolampros*) *tremperi*, new species.
 8. *Turbonilla* (*Pyrgolampros*) *hemphilli*, new species.
 9. *Turbonilla* (*Strioturbonilla*) *barkleyensis*, new species.
 10. *Turbonilla* (*Pyrgiscus*) *ina*, new species.
 11. *Turbonilla* (*Strioturbonilla*) *canadensis*, new species.

PLATE 45.

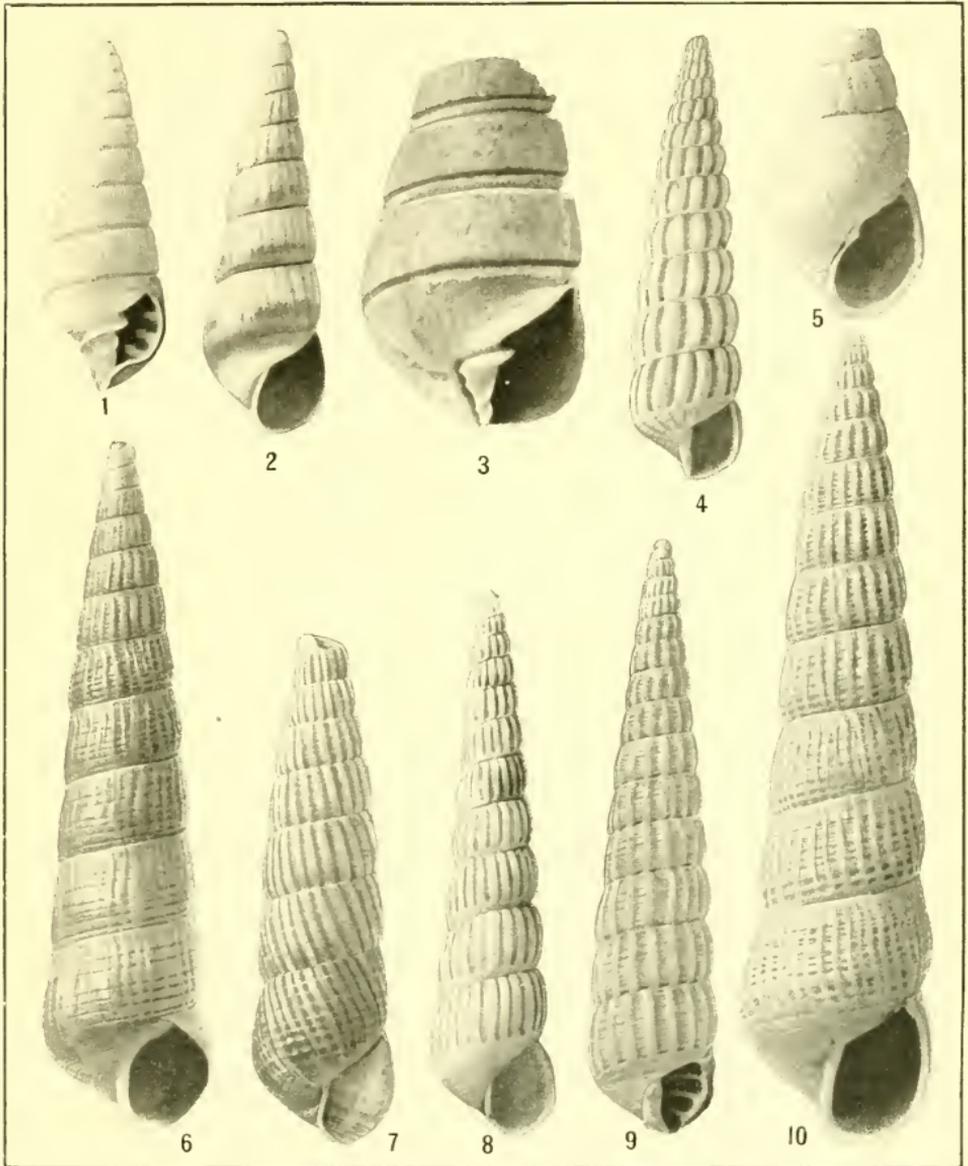
- FIG. 1. *Turbonilla* (*Cingulina*) *urdeneta*, new species.
 2. *Turbonilla* (*Pyrgiscus*) *bagerti*, new species.
 3. *Turbonilla* (*Pyrgiscus*) *cabrilloi*, new species.
 4. *Turbonilla* (*Pyrgiscus*) *tecalco*, new species.
 5. *Turbonilla* (*Pyrgiscus*) *bartolomensis*, new species.
 6. *Odostomia* (*Evalca*) *pleioregona*, new species.
 7. *Odostomia* (*Evalca*) *franciscana*, new species.
 8. *Turbonilla* (*Pyrgiscus*) *corsoensis*, new species.
 9. *Turbonilla* (*Pyrgiscus*) *mariana*, new species.
 10. *Turbonilla* (*Pyrgiscus*) *almejasensis*, new species.
 11. *Turbonilla* (*Pyrgiscus*) *lazarocensis*, new species.
 12. *Turbonilla* (*Pyrgiscus*) *cortezi*, new species.

PLATE 46.

- FIG. 1. *Odostomia (Chrysallida) santamariensis*, new species.
2. *Cerithiopsis (Cerithiopsis) helena*, new species.
3. *Odostomia (Chrysallida) taravali*, new species.
4. *Alvania bartolomensis*, new species.
5. *Alvania dinora*, new species.
6. *Alvania kyskacensis*, new species.
7. *Odostomia (Evalea) valeroi*, new species.
8. *Odostomia (Odostomia) orcutti*, new species.
9. *Cerithiopsis (Cerithiopsis) charlottensis*, new species.
10. *Cerithiopsis (Cerithiopsis) bakeri*, new species.
11. *Cerithiopsis (Cerithiopsis) charlottensis*, new species.
12. *Cerithiopsis (Cerithiopsis) grippi*, new species.

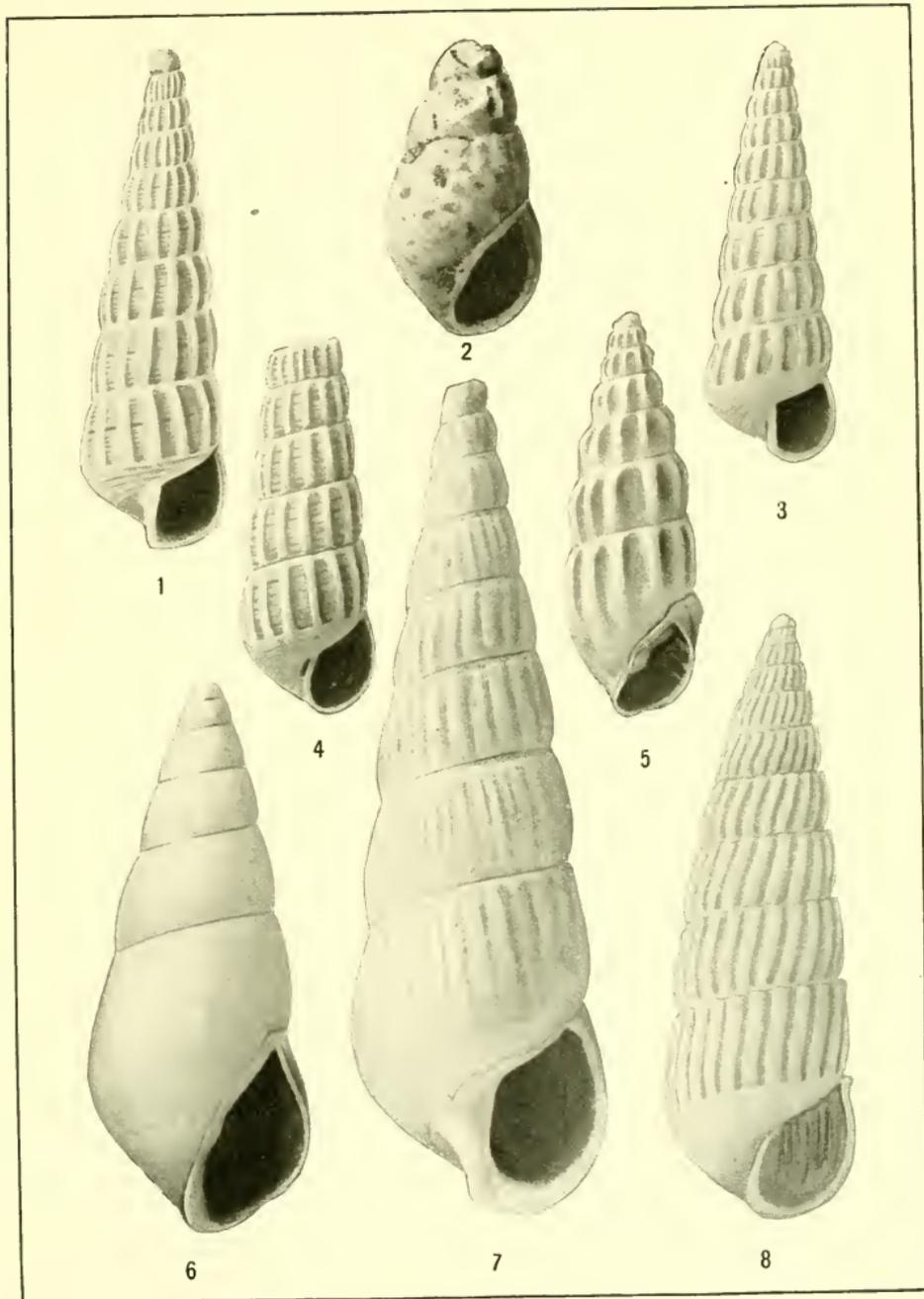
PLATE 47.

- FIG. 1. *Bittium serra*, new species.
2. *Bittium challisae*, new species.
3. *Bittium santamariensis*, new species.
4. *Bittium sanjuanensis*, new species.
5. *Bittium bartolomensis*, new species.
6. *Bittium challisae*, new species.



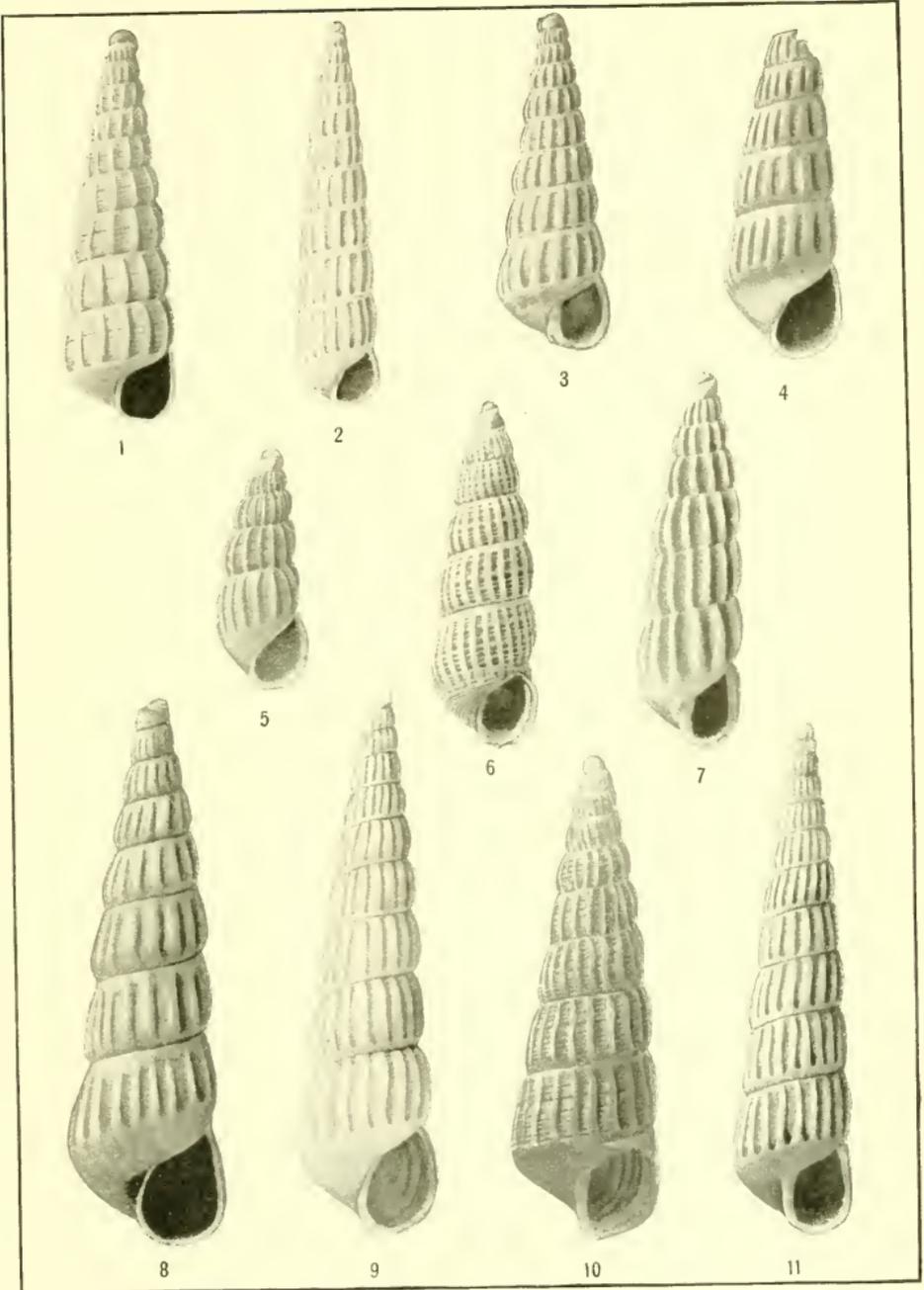
WEST AMERICAN MARINE MOLLUSKS.

FOR EXPLANATION OF PLATE SEE PAGE 680.



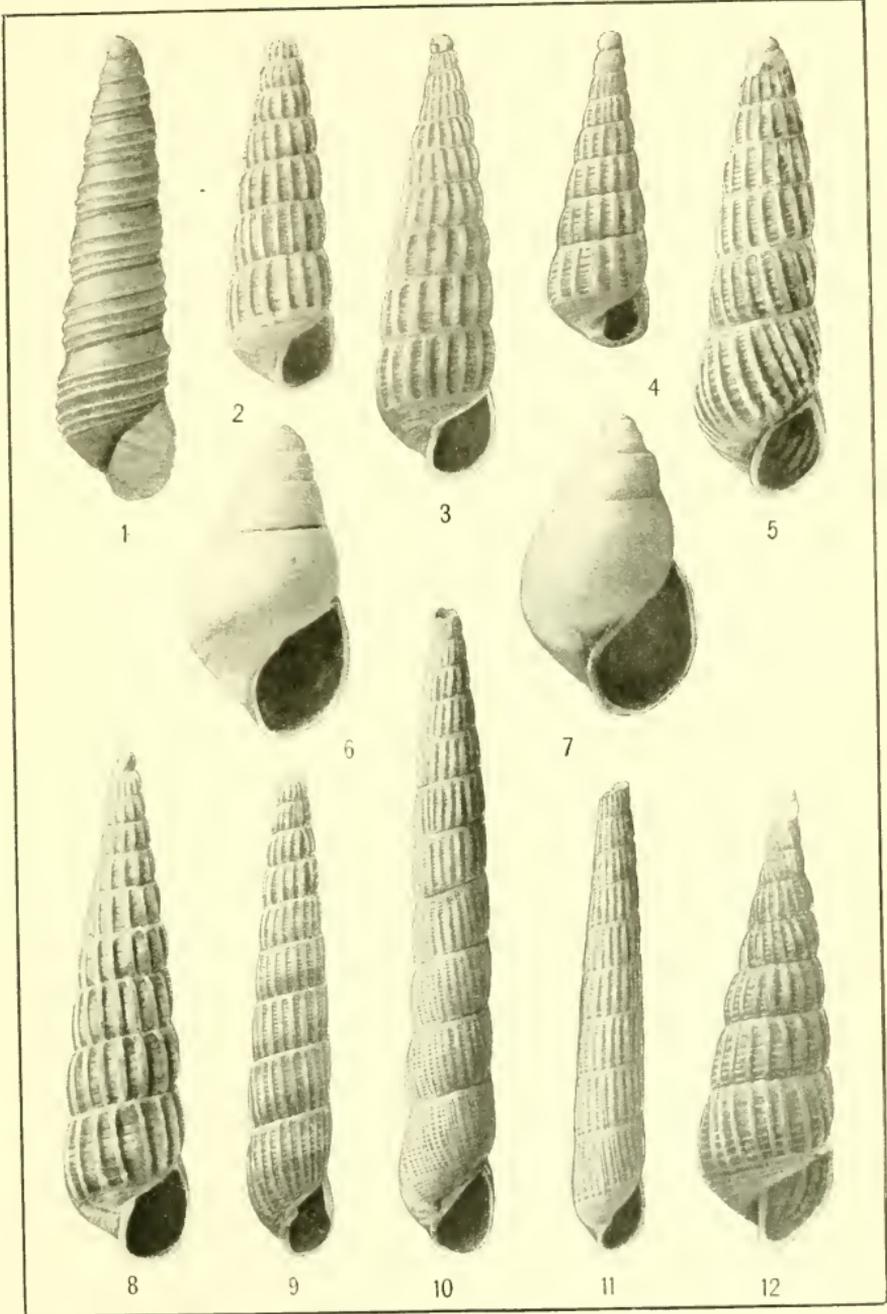
WEST AMERICAN MARINE MOLLUSKS.

FOR EXPLANATION OF PLATE SEE PAGE 680.



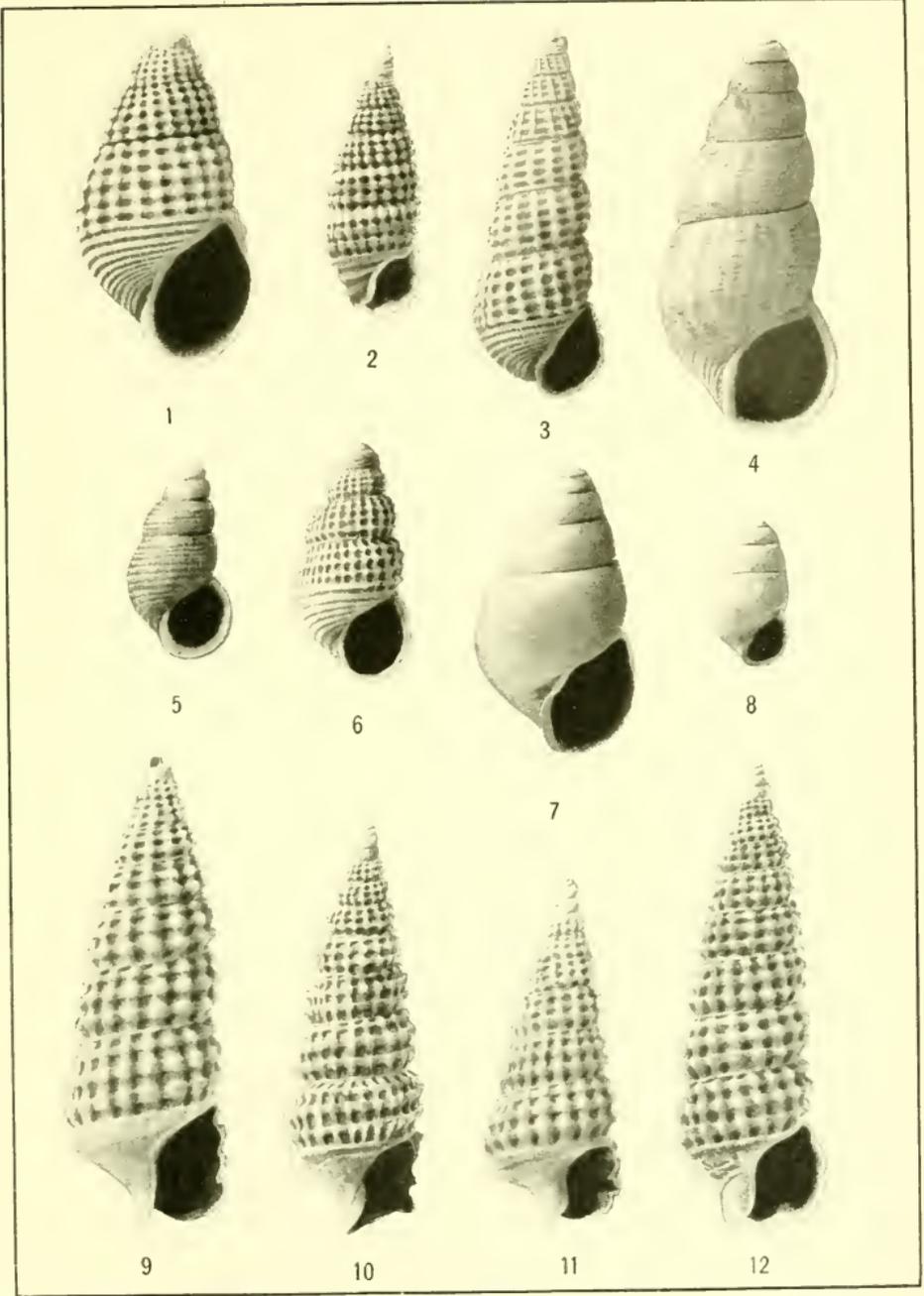
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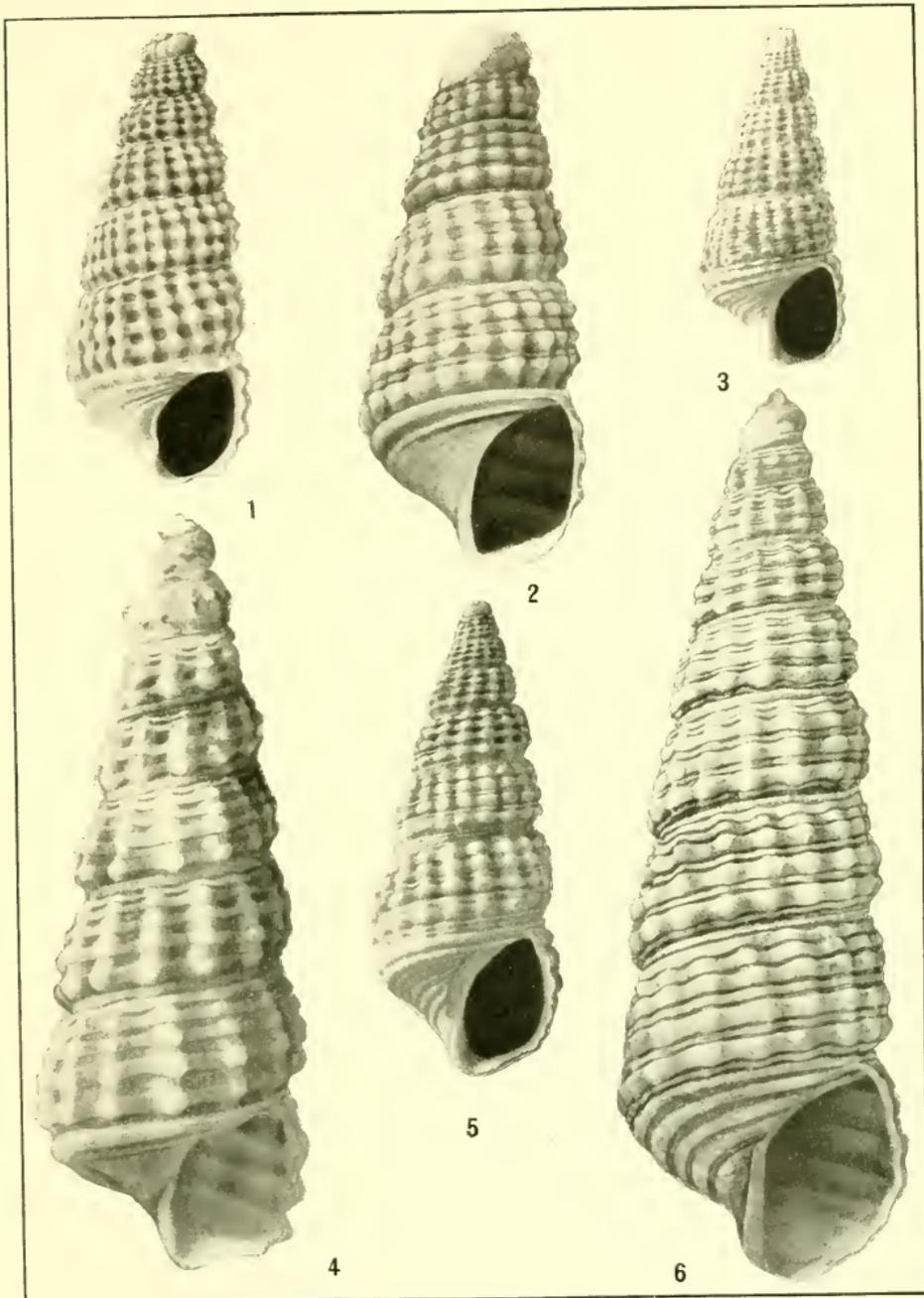
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WEST AMERICAN MARINE MOLLUSKS.

FOR EXPLANATION OF PLATE SEE PAGE 681.



WEST AMERICAN MARINE MOLLUSKS.

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