

DESCRIPTIONS OF NEW SPECIES OF MOLLUSKS OF THE
FAMILY TURRITIDAE FROM THE WEST COAST OF
AMERICA AND ADJACENT REGIONS.

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INTRODUCTION.

In the course of my revision of the marine mollusk-fauna of Western America it became necessary to take up the present family, which was in a regrettable state of confusion. This involved a review of the generic nomenclature as well, since it was well known that many invalid names were currently used, following the early work of Doctor Carpenter and others.

Circumstances connected with the war made a general revision of the nomenclature of the family impracticable. A revision of the genera chiefly concerned with the West American species and a bibliography of names which had been used for groups connected with the family was, however, possible and has already been issued.¹

The present paper is to be construed in the light of the data presented in the above-mentioned publication. In reviewing the fauna from San Diego northward it became necessary to include to a great extent that of the regions south of the United States boundary, since experience had shown, in connection with a study of the bivalves, that a certain proportion of the species extended their range not only into the Panamic fauna but even as far south as Peru.

In going over the material in the collection of the United States National Museum a large number of new forms were discovered, and their description forms the subject of this paper. A few of the species of Doctor Carpenter are now figured for the first time from his types. In all somewhat over 200 species are considered, of which 181 are new. Of these 93 belong to the fauna of the western coast of the United States from the Arctic Ocean to San Diego, California, including one species from our Hawaiian territory. Eleven species belong to the west coast of South America and its faunal connection, the Galapagos Islands; 89 belong to the Panamic fauna and its northern extension into the Gulf of California and the shores of the Californian peninsula.

¹ Proc. U. S. Nat. Mus., vol. 54, No. 2238, pp. 313-333, Apr. 5, 1918.

Quite a number of the species are from considerable depths, obtained during the explorations made by the United States Bureau of Fisheries steamer *Albatross*; and another large contingent is due to my own dredgings on the coast of Alaska and in Bering Sea during 1871 to 1880.

I am also under great obligations to a host of collectors in our Pacific States, who have with the greatest liberality intrusted me with material for study which has added much to our knowledge of the fauna and incidentally to the national collection.

To Mrs. E. M. Decker much credit is due for the careful retouching of the microphotographs of the new species from a study of the typical specimens under the compound microscope. And to Dr. Paul Bartsch, curator of invertebrates, United States National Museum, I am under many obligations for assistance in various ways during the preparation of the figures.

Some question having been raised as to the spelling of the family name which I have retained as first proposed by Henry and Arthur Adams in 1853, I submitted the question of "*Turridæ versus Turritidæ*" to two expert Latinists, who, after due consideration of all the data, concluded that, while either was correct, the latter term under the circumstances was to be preferred.

DESCRIPTIONS OF THE SPECIES.

Family TURRITIDAE.

Subfamily TURRITINAE.

TURRICULA LIBYA, new species.

Plate 2, fig. 5.

Shell solid, fusiform, the apex eroded, the surface white, covered with a blackish olive periostracum and having about seven (decollate) whorls; suture strongly appressed, obscure; anal fasciole wide, smooth, concave, the sulcus wide and shallow, close to the suture; spiral sculpture of a few feeble threads on the earlier whorls; axial sculpture of (on the penultimate whorl nine or ten, on the last whorl only three or four) short prominent riblets extending from the fasciole protractively forward to the succeeding suture on the spire; on the last whorl there is on the later part only an angle at the anterior edge of the fasciole; base moderately convex, aperture narrow, with a deep anal sulcus and a prominently arcuate, thin, sharp-edged outer lip; inner lip with a thin layer of white callus; pillar thick and solid, attenuated in front; axis not pervious, canal short, wide, not recurved. Height of (slightly decollate) shell, 40; of last whorl, 24; diameter, 13 mm. Cat. No. 96576, U.S.N.M.

Range.—Station 2830, off Cape San Lucas, in 66 fathoms, sand; U. S. Bureau of Fisheries.

The absence of the operculum makes the generic position somewhat doubtful.

Subgenus KNEFASTIA Dall.

Type.—*Pleurotoma olivacea* Sowerby, 1833, not of Reeve. 1843. +*funiculata* Valenciennes, 1839.

This includes such species as *P. duplicata* Sowerby and *olivacea* Tryon, of the Panamic fauna.

TURRICULA (KNEFASTIA) NIGRICANS, new species.

Plate 2, fig. 6.

Shell slender, acute, blackish brown with the anterior part of the last whorl pale reddish brown, a conspicuous periostracum, a closely appressed suture separated by a single cord from the constricted anal fasciole; whorls nine, without the (lost) nucleus; axial sculpture of (on the last whorl eight) prominent angular ribs with wider interspaces, beginning abruptly at the shoulder rapidly dwindling anteriorly and obsolete on the base; these ribs are crossed by (on the last whorl about 14) widely spaced slender cords, slightly nodulous at the intersections; aperture narrow, anal sulcus shallow, outer lip sharp, simple, a slight subsutural callus, the inner lip erased, the pillar straight, the canal wide and very slightly recurved. Height of shell, 38; of last whorl, 22; diameter, 11 mm. Cat. No. 96664, U.S.N.M.

Range.—Off Lower California in 21 fathoms sand. U. S. Bureau of Fisheries steamer *Albatross*.

This species belongs to the group of *T. olivacea* and *duplicata* Sowerby, though much more slender and differently sculptured.

TURRICULA (SURCULA) LAYSANICA, new species.

Plate 1, fig. 4.

Shell slender, fusiform, yellow brown with a broad white peripheral band, and a less well-defined one in front of the suture and the base, with eight well-rounded whorls exclusive of the (lost) nucleus; the suture appressed, the fasciole in front of it constricted, with only incremental lines; axial sculpture of about 15 slender rounded somewhat sigmoid ribs; these are crossed by (on the penultimate whorl seven or eight, on the last whorl more than 15) flattened cords with narrower almost channeled interspaces, toward the canal with intercalary threads, on the canal four or five with much wider interspaces; aperture ovate, outer lip thin, anal sulcus wide, not deep, with no subsutural callus, canal straight. Height of shell, 52; of last whorl and canal, 33; diameter, 15 mm. Cat. No. 274121, U.S.N.M.

Range.—Laysan Island, North Pacific Ocean; W. H. Golisch.

TURRICULA (SURCULA) PANTHEA, new species.

Plate 1, fig. 5.

Shell solid, acute, fusiform, white, with pale brown blotches between the ribs (the nucleus lost), with about 14 whorls; suture closely appressed, obscure with a rounded thread in front of it; anal fasciole close to the suture slightly depressed, spirally threaded, arcuately striated; spiral sculpture on the early whorls consisting of a peripheral keel with one strong thread behind it, the rest of the surface finely closely spirally threaded; the last three or four whorls peripherally waved with narrower interspaces over which the keel and thread are a little swollen, the fine threading continuing; the space in front of the keel on the last whorl with about 25 strong cords with wider interspaces; aperture narrow, anal sulcus distinct, without a subsutural callus; outer lip produced, thin, smooth inside, inner lip with a thin wash of enamel, the pillar straight, the canal long, narrow, with no siphonal fasciole or recurvation. Height of shell without the nucleus, 47; of last whorl, 28; diameter, 13.5 mm. Cat. No. 212348, U.S.N.M.

Range.—Station 2795, in Panama Bay, in 33 fathoms, bottom temperature 64.1° F., U. S. Bureau of Fisheries.

TURRICULA (SURCULA) LAVINIA, new species.

Plate 1, fig. 6.

Shell rather coarse with about a dozen whorls, the color yellowish or light brown, the nucleus smooth, slightly bulbous; suture strongly appressed with a spiral cord in front of it, the whorls moderately shouldered; the anal fasciole somewhat concave, spirally striate; axial sculpture of (on the last whorl about 12) protractively oblique rounded ribs with subequal interspaces, prominent on the periphery, attenuated on the base and not reaching the canal; incremental lines sharp, sometimes almost threadlike; spiral sculpture of (from three to five on the spire, about 10 on the last whorl) strong, rounded cords overriding the ribs and not swollen at the intersections, the interspaces subequal and sometimes with an intercalated smaller thread; lastly the surface is finely minutely spirally striate in the intervals between the larger threads and cords; aperture narrow, anal sulcus close to the suture, short and rounded, with a subsutural callus; outer lip produced, thin edged, more or less crenulate from the spiral sculpture, smooth within; inner lip and pillar with a rather thick layer of callus with slightly raised outer edge; pillar straight; siphonal fasciole feeble; canal short, wide, recurved. Height of shell, 49; of last whorl, 26.5; diameter, 16 mm. Cat. No. 56085, U.S.N.M.

Range.—West coast of Mexico.

LEUCOSYRINX PERSIMILIS BLANCA, new variety.

Shell differing from the original *persimilis* by the well-marked spiral sculpture being continuous over the whole surface and by the pronounced depressed spiral area on each side of the convex anal fasciole, which with the ridge at the shoulder gives the effect of two parallel ridges behind the periphery. Height of shell, 60; of last whorl, 44; diameter, 22 mm. Cat No. 214337, U.S.N.M.

Range.—Off Cape Blanco, Oregon, in 1,064 fathoms, mud, bottom temperature 35.9° F. U. S. Bureau of Fisheries steamer *Albatross*.

? LEUCOSYRINX GALAPAGANA, new species.

Plate 3, fig. 2.

Shell small for the genus, white under a straw-colored periostracum, thin, with about seven whorls exclusive of the (lost) nucleus; suture appressed, the edge slightly swollen, the fasciole in front of it slightly constricted; axial sculpture of about a dozen narrow rounded ribs with wider interspaces, beginning at the fasciole and obsolete on the base; also fine incremental lines rising to minute wrinkles near the suture; spiral sculpture on the penultimate whorl of about nine flattish threads with narrower interspaces, on the last whorl beyond these threads the interspaces become channeled grooves and the places of the threads wider flat areas, while on the canal these are replaced by more rounded closer threads; aperture narrow, the anal sulcus very shallow, outer lip thin, sharp, arcuate, simple; pillar and body erased, smooth, the pillar attenuate in front; canal narrow, straight. Height of shell, 20; of last whorl, 14; diameter, 7 mm. Cat. No. 96494, U.S.N.M.

Range.—Off the Galapagos Islands in 634 fathoms, coral sand, bottom temperature 40° F. U. S. Bureau of Fisheries steamer *Albatross*.

I felt some uncertainty as to whether this deep-sea species should be referred to *Surcula* or *Leucosyrinx*, as the shell characters partake of the characteristics of both to some extent.

LEUCOSYRINX AMYCUS, new species.

Plate 3, fig. 7.

Shell white with an ashy brown periostracum and six or more whorls, the apex eroded; suture slightly appressed, especially on the spire; anal fasciole wide and deep, somewhat in front of the suture and extending to a moderate peripheral carina; behind the carina the shell is feebly, and in front of it strongly spirally grooved with wider flat interspaces; aperture simple, outer lip thin, produced, inner lip erased, white, pillar gyrate but not pervious, canal distinct and slightly recurved. Height of shell, 52; of last whorl, 40; diameter, 20 mm. Cat. No. 204049, U.S.N.M.

Range.—Off Monterey Bay, California; in 871 fathoms, sand, bottom temperature about 38° F. U. S. Bureau of Fisheries steamer *Albatross*.

LEUCOSYRINX KINCAIDI, new species.

Plate 3, fig. 8.

Shell of moderate size, fusiform, with an acute spire and elongated canal, waxen white, nucleus of two smooth bulbous whorls with five subsequent whorls; axial sculpture only of faint incremental lines; spiral sculpture including a very prominent thin sharp peripheral keel and fine spiral striae with wider interspaces, over most of the surface; the interspaces become more rounded and coarser on the base; the entire space between the keel and the preceding suture may be said to form the anal fasciole, the wide arcuate sulcus being situated a little way in front of the suture; the base is neatly rounded and contracted at the beginning of the canal; outer lip thin, sharp, much produced in front, inner lip slightly erased; pillar obliquely attenuated in front, gyrate, and with a minutely pervious axis; canal narrow, slender; operculum yellowish, ovate, with an apical nucleus. Height of shell, 29; of last whorl, 21.5; diameter, 13 mm. Cat. No. 151581, U.S.N.M.

Range.—Shelikoff Strait, north of Kodiak Island, Alaska; Prof. Trevor Kincaid.

This very distinct species is extremely thin and fragile, indicating a "deep water habit."

CYMATOSYRINX HESPERA, new species.

Plate 20, fig. 2.

Shell small, white, polished, acute, with a small, smooth, glassy, inflated nucleus of one and a half whorls, with seven and a half subsequent whorls; suture appressed, obscure; anal fasciole immediately in front of it, constricted; spiral sculpture none; axial sculpture of (on the penultimate whorl 11) more or less sigmoid strong rounded ribs crossing the whole whorl, feebler on the base and fasciole, nearly continuous up the spire and with subequal interspaces; incremental lines rather regularly spaced and evident; aperture narrow with a varicosity behind the thin produced outer lip, anal sulcus conspicuous, rounded, with a marked subsutural callus; inner lip and pillar with a thin callus with a raised edge; canal distinct, constricted, deep, short, recurved, forming a keeled siphonal fasciole. Height of shell, 9; of last whorl, 4.5; diameter, 3.5 mm. Cat. No. 122799 U.S.N.M.

Range.—Station 2805, in Panama Bay, in 51 fathoms muddy bottom; U. S. Bureau of Fisheries.

CYMATOSYRINX ELISSA, new species?.

Plate 20, fig. 1.

A possible variety of the above, smaller, with a larger pinkish nucleus, eight or nine straighter ribs, not continuous up the spire, and

some very faint indications of spiral striae near the canal. There are in all seven whorls less inflated and with a less constricted fasciole. Height of shell, 7; of last whorl, 4; diameter, 2.5 mm. In other respects similar to the preceding. Cat. No. 122799a, U.S.N.M.

Range.—Same as the preceding.

? CYMATOSYRINX LALAGE, new species.

Plate 20, fig. 3.

Shell small, pinkish white, polished, acute, with a smooth nucleus of about two whorls and five subsequent hardly rounded whorls; spiral sculpture of a few obscure threads on the canal; suture obscure, strongly appressed; anal fasciole slightly constricted; axial sculpture of (on the penultimate whorl nine) strong rounded ribs most prominent at the periphery, extending from suture to suture, with subequal interspaces, obsolete on the last half of the last whorl and on the base; incremental lines irregular, obscure; there is a hump-like varix some distance behind the outer lip; aperture narrow, anal sulcus conspicuous, rounded, with a heavy subsutural callus; outer lip thin with no internal lirae, moderately produced; inner lip callous, pillar short, thick, canal wide, very short, hardly differentiated from the aperture. Height of shell, 8; of last whorl, 5; diameter, 3 mm. Cat. No. 55491, U.S.N.M.

Range.—Gulf of California, Stearns collection.

This form is somewhat intermediate between *Kylia* and *Cymatosyrinx*.

CYMATOSYRINX PLICATELLA Dall.

Plate 20, fig. 4.

Clathurella plicatella DALL, Bull. Mus. Comp. Zool., vol. 43, No. 6, p. 289, Oct. 1908.

Range.—Station 2799, in Panama Bay, in 29½ fathoms muddy bottom; U. S. Bureau of Fisheries steamer *Albatross*.

Type-specimen.—Cat. No. 110604, U.S.N.M. This shell is smaller than most of the forms referred to this group, but appears to have all the proper characters, though in miniature.

? CYMATOSYRINX FERMINIANA, new species.

Plate 8, fig. 4.

Shell white, with a yellowish base, slender, acute, with a swollen smooth white nucleus of about two whorls and six subsequent whorls; suture appressed, on the earlier whorls the posterior edge is prominent; whorls moderately rounded; spiral sculpture absent from the spire, on the last whorl hardly visible except on the extreme anterior base and siphonal fasciole where there are a few impressed lines; axial sculpture of (on the last whorl 12) somewhat sigmoid ribs, feebly arcuate on the anal fasciole, strongest in front of it, rather

sharp-edged, extending mostly over the base, and with somewhat wider interspaces; they are not continuous up the spire; aperture rather narrow, the anal sulcus conspicuous, with a subsutural callus; outer lip thin, sharp, with a ribless space and a small varix behind it, smooth internally; inner lip and pillar callous, smooth; canal distinct, small, narrow, short, somewhat recurved, with an evident siphonal fasciole. Height of shell, 14.2; of last whorl, 7.5; diameter, 5 mm. Cat. No. 214267, U.S.N.M.

Range.—Station 3034, off Point San Fermin, Lower California, in 24 fathoms, gray mud; U. S. Bureau of Fisheries.

This shell is slightly decorticated and may have been polished when fresh. It is somewhat intermediate in character between *Elaeocyma* and *Cymatosyrinx*.

? CYMATOSYRINX PALMERI, new species.

Plate 19, fig. 7.

Shell small, brilliantly polished, light brown, with six whorls exclusive of the (lost) nucleus; suture distinct, closely appressed, undulated by the axial sculpture; anal fasciole constricted; spiral sculpture none; axial sculpture of (on the last whorl 10) rounded sigmoid ribs, feebler where they cross the fasciole, fading out on the base, and most prominent at the periphery, with subequal interspaces; aperture moderately wide, anal sulcus large, close to the suture, with a thick subsutural callus; outer lip thickened with no internal lirae, a knob-like varix a little way behind it; body and pillar callous, siphonal sulcus deep, canal wide, short, slightly recurved. Height of (decollate) shell, 9.5; of last whorl, 7; diameter, 4 mm. Cat. No. 56036, U.S.N.M.

Range.—Beach at the head of the Gulf of California, collected by Dr. E. Palmer.

In another lot of specimens bleached white (No. 56040) one or two have a few more ribs and a few faint spiral lines on the base, but they appear to be only mutations of the same species, and are from the same locality. This is another of those species which seem intermediate between *Elaeocyma* and *Cymatosyrinx*.

CYMATOSYRINX IDOTHEA, new species.

Plate 21, fig. 11.

Shell small, thin, acute, rose pink, not polished, with a blunt nucleus of one and a half smooth inflated whorls, and five well rounded subsequent whorls; suture distinct, appressed, the adjacent fasciole constricted; spiral sculpture none; axial sculpture of (on the last whorl about a dozen) protractively oblique sigmoid riblets, faint on the base and practically absent from the fasciole, with subequal interspaces; aperture moderately wide; anal sulcus wide and deep, adjacent to the suture and with no subsutural callus; outer

lip thin, sharp, prominently produced; inner lip erased, pillar stout, short, white, obliquely attenuated in front; canal wide, short, hardly differentiated from the aperture. Height of shell, 9; of last whorl, 5; diameter, 4 mm. Cat. No. 96194, U.S.N.M.

Range.—Station 2777, in the Straits of Magellan, in 20 fathoms, gravel; U. S. Bureau of Fisheries.

The aperture of the specimen figured is defective.

CYMATOSYRINX HECUBA, new species.

Plate 20, fig. 9.

Shell small, acute, rosaceous, solid, with six whorls, excluding the (damaged) nucleus, differing from the preceding species by its more slender shell, wider fasciole, over which the ends of the ribs reach the preceding suture, forming a more pronounced shoulder at the periphery, and having the whole shell spirally sculptured by small equal threads with subequal interspaces. The pillar is longer and the canal distinct, longer, and somewhat constricted. Otherwise the shells are very similar and the nucleus, though damaged, appears to have been of the same character. Height of shell, 11; of last whorl, 6.5; diameter, 4.5 mm. Cat. 73995, U.S.N.M.

Range.—Gulf of California; Stearns collection.

This was named *rosacea* by Carpenter in manuscript, but is not the *rosacea* of Mighels, in 1845. The surface is polished, but that may be due to wear, as it is evidently a beach specimen. The aperture is incomplete in the specimen.

ELAEOCYMA IANTHE, new species.

Plate 4, fig. 6.

Shell acute, polished, white with touches of brown on the anal fasciole and on the last whorl behind the varix; nucleus blunt, the first whorl smooth, the second peripherally carinate; subsequent whorls eight, moderately rounded; suture distinct, appressed, somewhat undulate, the anal fasciole narrow, slightly constricted; spiral sculpture of (on the penultimate whorl 3 or 4) incised lines in front of the periphery, the wider interspaces raised and more or less rounded, on the last whorl there are 16 or more, extending to the canal; the incised lines have a more opaque appearance contrasting with the translucent white of the whorls; there is no fine spiral striation; axial sculpture of (on the penultimate whorl about a dozen) strong, wide ribs less prominent on the fasciole and fading out on the base and the last half of the last whorl; the interspaces equal or sometimes wider; the ribs are cut by the incised lines but are not nodulose; they are most prominent on the anterior half of the whorls of the spire and on the periphery of the last whorl; aperture narrow, anal sulcus deep and rounded, with a prominent subsutural

callus; outer lip sharp-edged, with a moderate varix behind it, arcuately produced; inner lip with a rather thick layer of enamel; canal distinct, rather wide, somewhat recurved. Height of shell, 17; of last whorl, 8.7; diameter, 6.5 mm. Cat. No. 212367, U.S.N.M.

Range.—Station 3020, off Cape Tepoca, Gulf of California, in 7 fathoms, sand and shelly bottom, United States Bureau of Fisheries.

This is one of the most elegant of the smaller species of the group.

ELAEOCYMA ATTALIA, new species.

Plate 18, fig. 7.

Shell small, slender, acute, white, polished, with eight flattish whorls exclusive of the (lost) nucleus; suture obscure, appressed, fasciole immediately adjacent, rather wide, and constricted; spiral sculpture of a few incised lines on the base and threads on the canal; axial sculpture of (on the penultimate whorl about fourteen) low feeble ribs, almost knoblike, stronger on the earlier whorls, but which do not reach the base or cross the anal fasciole and which disappear on the last half of the last whorl where there is a moundlike varix and traces of a yellowish spot; aperture small, anal sulcus deep, with a subsutural callus; outer lip thin, sharp, arcuately produced; inner lip and pillar with a thin layer of enamel; pillar short, canal very short and hardly differentiated from the aperture. Height of shell, 8.5; of last whorl, 4; diameter, 3 mm. Cat. No. 168677, U.S.N.M.

Range.—West coast of Mexico, probably near Mazatlan.

The specimen is translucent white, but is not improbably more or less bleached.

ELAEOCYMA ARBELA, new species.

Plate 4, fig. 3.

Shell small, glistening, acute, brownish, with the projecting sculpture paler; nucleus dark brown, glassy, rather irregularly coiled, of one smooth whorl followed by a peripherally keeled turn and about eight subsequent whorls; suture distinct, appressed, with a nodulose band in front of it where the ends of the ribs are cut off by a very narrow fasciolar constriction; spiral sculpture of a few incised lines cutting only the interspaces between the ribs, on the spire; on the last whorl there are six or seven of these lines, with much wider interspaces, followed by three strong cords close-set on the canal; axial sculpture of (on the last whorl about 13) protractively oblique whitish narrow ribs extending from the fasciole to the cords of the canal, with subequal interspaces and not continuous up the spire; incrementatl lines evident, silky; aperture narrow, anal sulcus deep and rounded, with a strong subsutural callus; outer lip sharp-edged, with a feeble varix and a brown spot behind it; inner lip and pillar with a thick coat of white enamel, the throat not lirate; canal

constricted, very short, deep, and slightly recurved. Height of shell, 13.7; of last whorl, 6.5; diameter, 5 mm. Cat. No. 106495, U.S.N.M.

Range.—Scammon Lagoon, Lower California, collected by Henry Hemphill.

ELAEOCYMA HALOCYDNE, new species.

Plate 4, fig. 4.

Shell slender, acute, rather flat-sided, purplish brown usually more or less obscured by a yellowish white glaze: nucleus with the first turn smooth, inflated, the second has a peripheral keel and is followed by about eight and a half subsequent whorls; suture strongly appressed with a smooth narrow band in front of it and behind the somewhat constricted fasciole; other spiral sculpture of sharply incised lines, four or five on the spire between the sutures, equal and with wider equal rounded interspaces, and about 24 on the last whorl, the interspaces becoming more cord-like near the canal and sometimes feebly nodulous where the lines cut the ribs; axial sculpture of (on the penultimate whorl about 18) feeble narrow ribs, stronger near the apex, obsolete on the last whorl, with wider interspaces, beginning in front of the fasciole, hardly reaching the base, and protractively oblique: there are also fine sharp incremental lines, chiefly evident in the depressions, but here and there finely reticulating the interspaces; aperture rather wide, anal sulcus conspicuous, rounded; outer lip thin, prominently arcuate, smooth within; inner lip with a thin layer of brownish enamel, the edge raised anteriorly; canal distinct, slightly constricted, with a small concentrically striated siphonal fasciole. Height of shell, 18; of last whorl, 10; diameter, 6 mm. Cat. No. 216748, U.S.N.M.

Range.—Station 203, off San Pedro; University of Southern California.

ELAEOCYMA AEOLIA, new species.

Plate 3, fig. 1.

Shell small, brilliantly polished, pinkish brown, with a minute smooth-pointed nucleus of three whorls and seven subsequent whorls; suture distinct, appressed, constricted, and slightly undulated by the sculpture; spiral sculpture of (on the spire two) incised lines in front of the shoulder with much wider interspaces, on the last whorl there are about 10, extending to the canal; axial sculpture of (on the last whorl 11) rounded protractively oblique ribs, somewhat lighter colored than the body of the shell, extending from the shoulder to the base and not crossed by the incised lines, the interspaces subequal, the ribs not continuous up the spire; aperture rather wide, and sulcus well marked, short and close to the suture; outer lip thickened, the edge sharp; inner lip erased, pillar short, canal wide, short, slightly recurved. Height of shell, 7; of last whorl, 3.5; diameter, 2.5 mm. Cat. No. 208592, U.S.N.M.

Range.—Station 3020, off Cape Tepoca, Gulf of California, in 7 fathoms, sand, and shell; U. S. Bureau of Fisheries.

ELAEOCYMA EMPYROSIA Dall.

Plate 4, fig. 1.

Drillia empyrosia DALL, Nautilus, vol. 12, No. 11, p. 127, March, 1899; Proc. U. S. Nat. Mus., vol. 24, No. 1264, p. 516, pl. 39, fig. 5, March, 1902.

Elaeocyma empyrosia DALL, Proc. U. S. Nat. Mus., vol. 54, No. 2238, p. 317, April 5, 1918.

Range.—Off San Pedro, Cal., in moderate depths of water. This is the typical species of *Elaeocyma*.

ELAEOCYMA ABDERA, new species.

Plate 4, fig. 5.

Shell small, acute, thin, of a dull waxen color with a darker blotch behind the aperture and a dark brown nucleus of a whorl and a half, smooth and polished, and nine subsequent whorls; spiral sculpture of obscure fine threads, on the last whorl in addition there is a more prominent duplex thread in front of the suture; on the base are four other widely separated threads only prominent as nodules at their intersection with the line of the ribs; there are six or more finer threads on the canal; axial sculpture of (on the last whorl 7 or 8) ribs which appear at the periphery as conspicuous nodules and become obsolete on the base except at the intersections above mentioned; there are also fine, sharp, close, arcuate incremental lines on the anal fasciole; the peripheral nodules are more riblike and numerous on the earlier part of the spire; aperture short, rather wide, the anal sulcus deep, oval, almost tubular; outer lip moderately thickened, sharp-edged, smooth inside, with a prominent knob behind it; inner lip smooth with a rather thick layer of enamel continued down the pillar with a raised edge and a chink behind it; canal short and wide, hardly differentiated, with an inconspicuous siphonal fasciole. Height of shell, 15; of last whorl, 8; diameter, 6 mm. Cat. No. 212373, U.S.N.M.

Range.—Panama Bay at station 2798, in 18 fathoms, sandy bottom. U. S. Bureau of Fisheries.

This specimen is not as brilliantly polished as most of the species of the group which, however, may be due to wear.

ELAEOCYMA AEGINA, new species.

Plate 4, fig. 2.

Shell brownish, pale on the early whorls, with a whitish glaze, polished, acute, except for the nuclear apex, which is flattened; nucleus smooth, polished, of two whorls, the second sharply keeled and passing gradually into the sculpture of the subsequent eight and a half whorls; suture strongly appressed behind the concave arcuately

striated anal fasciole; axial sculpture of (on the last whorl 10) prominent protractive ribs extending from the fasciole to the succeeding suture on the spire and somewhat over the periphery on the last whorl; these ribs are knob-like and prominent on the periphery and rapidly diminish forward; incremental sculpture faint; spiral sculpture begins on the early whorls with about four faint striæ which grow sharper on the later whorls which carry four or five grooves with wider flattish interspaces between the periphery and the succeeding suture, with on the later whorls sometimes one or two on the anal fasciole, on the last whorl there are 16 or more in all; the last rib on the last whorl is more swollen than the others and usually darker in color; aperture narrow, outer lip thin, sharp, produced, smooth internally with a deep rounded anal sulcus close to the suture with a heavy lump of callus on the side of the body; inner lip with a rather thick callus with a raised edge extending to the end of the pillar; canal short, wide, deeply cut, with a small keel bordering the posterior edge of the siphonal fasciole. Operculum dark brown. Height of shell, 13; of last whorl, 6.5; diameter, 4.8 mm. Cat. No. 266371, U.S.N.M.

Range.—Agua Verde Bay, Gulf of California, Dr. Paul Bartsch.

? *ELAEOCYMA AEROPE*, new species.

Plate 1, fig. 3.

Shell small, acute, whitish, with a polished, smooth, trochiform nucleus of about two and a half whorls and eight or more subsequent whorls; suture distinct, slightly appressed, anal fasciole slightly constricted; spiral sculpture of sharp narrow grooves, with much wider flat smooth interspaces; there are about eleven of the grooves on the last whorl between the shoulder and the spirally threaded siphonal fasciole; the anal fasciole is not spirally striate; axial sculpture of (on the last whorl about 10) sharp-edged ribs, with wider interspaces, compressed and arcuate on the anal fasciole, nearly vertical elsewhere and extending over the whole whorl, but not continuous over the spire; incremental lines inconspicuous; aperture rather wide and short with a deep rounded anal sulcus and prominent subsutural callosity; outer lip subvaricose, sharp-edged, smooth within; inner lip with a thick layer of enamel; its outer edge raised with a slight chink between it and the siphonal fasciole; pillar short, straight; canal deep, short, wide, and slightly recurved. Height of shell, 16; of last whorl, 8; diameter, 6 mm. Cat. Nos. 266398, U.S.N.M. (showing nucleus) and 266311, U.S.N.M. (adult shell).

Range.—Agua Verde Bay, Lower California, Dr. Paul Bartsch.

The specimen has a dull surface, which is probably due to wear.

CLATHRODRILLIA PAZIANA, new species.

Plate 5, fig. 1.

Shell small, acute, pale olivaceous, with 10 whorls, of which the first nuclear is smooth, the second obscurely peripherally keeled, the subsequent whorls normally sculptured; suture distinct, the periphery of the upper whorls nearer the succeeding than the preceding suture; anal fasciole constricted but crossed by the ribs; spiral sculpture of (on the upper whorls 4 or 5, on the last whorl about 14) strong cords with narrower groove-like interspaces, extending from the fasciole to the canal; the cords not swollen where they cross the ribs; axial sculpture of (on the penultimate whorl 13, on the last whorl 10) rounded ribs with subequal interspaces, strongest at the shoulder, extending from suture to base, the incremental lines rather strong on the fasciole; anal sulcus deep and rounded with callous margin, the outer lip arcuate, thin; the inner lip simple, canal slightly recurved. Height of shell, 13; of last whorl, 7; diameter, 5 mm. Cat. No. 311372, U.S.N.M.

Range.—La Paz, Lower California.

Though small, this is a typical *Clathrodrillia*.

CLATHRODRILLIA LIMANS, new species.

Plate 13, fig. 3.

Shell small, of a warm yellow brown, with a blunt short smooth nucleus of a whorl and a half and five or more subsequent moderately rounded whorls; suture distinct, appressed, moderately constricted with three or four fine spiral striae on the fasciole; spiral sculpture of (on the penultimate whorl between the fasciole and the succeeding suture about six) fine equal, equally spaced threads, with narrower deep interspaces, forming minute nodules where they cross the ribs, on the last whorl the threading continues hardly altered, to the end of the canal; axial sculpture (on the penultimate whorl about 35) narrow ribs with subequal interspaces, extended from the fasciole to the canal, forming a very uniform reticulation over the whole surface; aperture (the outer lip defective) rather wide, the inner lip erased, the pillar short, stout, whitish; the canal very short and wide, hardly differentiated from the aperture. Height of shell, 7; of last whorl, 4; diameter, 3.5 mm. Cat. No. 56218, U.S.N.M.

Range.—Gulf of California; Stearns collection.

This shell was sent to Dr. Philip Carpenter by Stearns and returned to him with the above manuscript name, but never published. The aperture when complete is probably of the usual *Clathrodrillia* type.

CLATHRODRILLIA CASTIANIRA, new species.

Plate 2, fig. 1.

Shell small, white, apex eroded, having five or more whorls exclusive of the (lost) nucleus; whorls well rounded, anal fasciole excavated, close to the appressed suture; spiral sculpture of (on the upper whorls in front of the fasciole, three, on the last whorl about a dozen between the fasciole and the end of the canal) strong, equal, equally spaced, rounded threads with wider smooth interspaces; axial sculpture of (on the penultimate whorl 14) low riblets barely reaching the base and starting from the shoulder, with subequal interspaces, and becoming obsolete near the aperture; they are subnodulous at the intersections with the spirals; aperture rather wide, anal sulcus deep, close to the suture with a subsutural callus; inner lip erased; outer lip thin, hardly varicose; canal distinct, short, recurved. Height of shell, 10; of last whorl, 6; diameter, 4.5 mm. Cat. No. 214246, U.S.N.M.

Range.—Station 3189, off Cape San Martin, California, in 218 fathoms, mud, bottom temperature 43.2° F. U. S. Bureau of Fisheries.

CLATHRODRILLIA AENONE, new species.

Shell yellowish brown, of about seven whorls exclusive of the (lost) nucleus, spire acute, the whorls markedly shouldered, the suture strongly appressed with a strong cord in front of it; anal fasciole excavated, arcuately striated, with a few obscure fine spiral threads running in it; axial sculpture of (on the last whorl fifteen) short prominent nearly vertical subrectangular ribs rounded above and confined to the peripheral region in front of which on the base of the last whorl are about twice as many thread-like ridges mostly continuous over the base to the beginning of the canal; incremental lines rather marked; spiral sculpture of three or four threads with wider interspaces overrunning and sometimes slightly nodulating the peripheral ribs; in front of these on the base are about eight spiral threads conspicuously nodulous at the intersections with the minor ridges, and with much wider interspaces; on the younger shells these threads are more close set, fewer and less nodulous, the minor ridges inconspicuous; finally between these in the adult are more or less distinct finer spiral striae; the canal is also spirally threaded with a conspicuous siphonal fasciole; aperture rather narrow with a well-marked anal sulcus close to the suture, and on the body a prominent subsutural callus; outer lip produced, sharp-edged, smooth within; inner lip callous, the outer edge of the enamel slightly raised, and on the canal prominent with a chink between it and the siphonal fasciole; canal short, recurved; height (without the nuclear whorls),

35; height of last whorl, 18; diameter, 12 mm. Cat. No. 266370, U.S.N.M.

Range.—Agua Verde Bay, Lower California; Dr. Paul Bartsch. The outer lip is more or less crenulated at the edge by the spiral sculpture.

? *CLATHRODRILLIA RESINA* Dall.

Plate 2, fig. 4.

Turris (Surcula) resina DALL, Bull. Mus. Comp. Zoöl., vol. 43, No. 6, p. 264, 1908.

Range.—Station 3354, Gulf of Panama, in 322 fathoms, mud, bottom temperature 46° F. U. S. Bureau of Fisheries steamer *Albatross*. Cat. No. 123103, U.S.N.M.

This species is intermediate between *Clathrodrillia* and some of the species of *Surcula*, but on the whole is nearer the former by its sculpture and the latter in its straight canal.

CLATHRODRILLIA CALLIANIRA, new species.

Plate 5, fig. 2.

Shell slender, acute, pale brownish, with a smooth regularly increasing nucleus of two and a half whorls and eight and a half subsequent whorls; suture closely appressed with a cord-like edge behind the strongly constricted, arcuately striated anal fasciole; spiral sculpture of (on the penultimate whorl about seven) flattish, close-set cords; in some specimens these alternate in size, in others they are nearly equal; on the last whorl there are about 25, some irregularly larger than the others, and a few smaller threads on the canal; axial sculpture of (on the last whorl 10 to 14) rounded ribs with subequal interspaces, more conspicuous and less numerous as we ascend the spire, over which the spiral sculpture passes without nodulation; aperture short, subovate, anal sulcus short rounded, with a subsutural callus; outer lip arcuate, thin, smooth inside, without any marked varix behind it; inner lip and pillar with a smooth callus; canal short, slightly recurved. Height of shell, 16; of last whorl, 8.5; diameter, 5.5 mm. Cat. No. 96722, U.S.N.M.

Range.—Station 2823, off Lower California in 27 fathoms, sand, U. S. Bureau of Fisheries.

CLATHRODRILLIA ANDROMEDA, new species.

Plate 2, fig. 2.

Shell acute, fusiform, whitish with a brown periostracum; nucleus small, the apex minutely globular and, with the succeeding inflated whorl, smooth; subsequent whorls eight, regularly increasing in diameter; suture closely appressed, obscure, bordered in front by two undulated cords, the anterior cord larger; axial sculpture of (on the last whorl 18) equal narrow nodulous ribs with subequal interspaces,

the ribs extending well over the base from the anterior margin of the anal fasciole, where they form a marked shoulder; the incremental lines are hardly noticeable except on the fasciole; spiral sculpture of (on the spire three) strong cords, the posterior slightly larger, which become swollen and nodulous where they intersect the summit of the ribs; on the last whorl there are 7 of these cords and 10 minor threads in front of the base and on the canal; in the interspaces between the major cords there are from one to three fine threads which do not become nodulous; anal fasciole narrow, concave, somewhat removed from the suture, the sulcus shallow; in the type-specimen the outer lip is thin and sharp, the inner lip erased, but if the specimen is immature the outer lip would probably be thickened with a subsutural callus in the adult; pillar straight, attenuated in front, white; canal distinct, not recurved. Height of shell, 16.5; diameter, 8.5 mm. Cat. No. 211516, U.S.N.M.

Range.—Station 2828, in 10 fathoms, off La Paz, Lower California. U. S. Bureau of Fisheries.

CARINODRILLIA, new section.

For the species in which the spiral sculpture predominates and in which there is a tendency for the peripheral cord to form a carina, the name *Carinodrillia* is proposed with *Clathrodrillia halis* Dall, as the type. This forms a very natural group containing a large number of species mostly unicolor, whitish or brownish.

CLATHRODRILLIA (CARINODRILLIA) HALIS, new species.

Plate 5, fig. 4.

Shell yellowish white, elongated, acute, with two polished, more brownish nuclear whorls and nine subsequent whorls; suture appressed with an angular thread in front of it, separated by an excavated wide fasciole, microscopically spirally striated, from an acute shoulder surmounted by a single cord; other spiral sculpture of (on the last whorl nine) widely separated subequal cords on the posterior one of which the suture is laid; these have the interspaces minutely striated and are not swollen when they pass over the ribs; axial sculpture of (on the last whorl six) short, very prominent ribs with narrower interspaces, not continuous up the spire and horizontally angulated by the cord which forms the periphery; they undulate the succeeding suture but are obsolete on the base and anal fasciole; on the early part of the spire the peripheral cord is duplex, but the posterior thread gradually fades out; aperture narrow, anal sulcus deep, rounded, outer lip thin, sharp, arcuately produced; inner lip erased, pillar short, canal very short but distinct. Height of shell, 20; of last whorl, 10; diameter, 7 mm. Cat. No. 211649, U.S.N.M.

Range.—Station 2822, off La Paz, Lower California, in 21 fathoms, sand, U. S. Bureau of Fisheries.

If the specimen is not quite mature the aperture may prove to be more elaborate in the adult. The shell is intermediate in type between *Suavodrillia* and *Clathrodrillia*. The soft parts being absent the presence of an operculum is tentatively assumed.

CLATHRODRILLIA (CARINODRILLIA) ALCESTIS, new species.

Plate 5, fig. 6.

Shell slender, acute, pale yellowish brown (the nucleus lost), with about ten whorls; suture strongly appressed with a prominent cord (afterwards broadening into a band) in front of it; siphonal fasciole constricted; with only arcuate striation; sculpture on the early whorls of two or three strong cords, swollen where they override the ribs, these are prominent on the periphery; on the later whorls the peripheral cord becomes an undulated keel and the interspaces are closely spirally striate; on the last whorl in front of the keel are about a dozen major threads with wide spirally striate interspaces; axial sculpture of (on the last whorl seven) peripheral waves, rather than ribs, overridden by the spirals, the incremental lines inconspicuous; aperture narrow, anal sulcus slightly removed from the suture, distinct, with a small subsutural callus; outer lip moderately produced, sharp edged, slightly crenulate by the spiral sculpture, smooth within; inner lip with a moderate layer of callus, with slightly raised outer edge which is continued over the pillar and on the canal is separated from the feeble siphonal fasciole by a narrow chink; canal short, wide, slightly recurved. Height of shell (without the nucleus), 30; of last whorl, 16.5; diameter, 8 mm. Cat. No. 212354, U.S.N.M.

Range.—Station 3037, off Guaymas in the Gulf of California in 20 fathoms green mud. U. S. Bureau of Fisheries.

CLATHRODRILLIA (CARINODRILLIA) THESTIA, new species.

Plate 5, fig. 3.

Shell slender, acute, strongly sculptured, with pale brownish clouding on a yellowish white ground; nucleus smooth, inflated, of a whorl and a half, followed by about eight sculptured whorls; suture distinct, undulated, strongly appressed, thick-edged, with a strong cord immediately behind the strongly constricted smooth anal fasciole; other spiral sculpture of (on the spire one or two) strong peripheral cords, swollen and almost angulated where they override the ribs; on the last whorl there are six or seven cords with much wider interspaces and as many more smaller close-set threads on the canal; axial sculpture of seven or eight very prominent short ribs on the penultimate whorl; fading out on the last whorl, and rather prominent widely spaced incremental lines most conspicuous on the last whorl; aperture subovate, anal sulcus conspicuous, rounded, with a marked

subsutural callus; outer lip thin, moderately arcuate, not varicose, inner lip with a coat of enamel with the anterior edge raised; pillar short, straight, the canal hardly differentiated from the aperture. Height of shell, 14; of last whorl, 7; diameter, 5 mm. Cat. No. 56038, U.S.N.M.

Range.—On the beach at the head of the Gulf of California, collected by Dr. E. Palmer.

CLATHRODRILLIA (CARINODRILLIA) HALIPLEXA, new species.

Plate 5, fig. 5.

Shell with 12 whorls, excluding the (defective) nucleus, pale brown, acute, with inconspicuous suture, with eight or nine prominent axial ribs with equal or wider interspaces and faint incremental lines; anal fasciole wide, constricted, a single strong cord and fine spiral threads between it and the suture; in front of the fasciole are about six strong cords slightly swollen as they override the ribs, with much wider interspaces occupied by fine spiral threads, the cord at the periphery stronger than the rest; the base with threads of intermediate size, close-set; outer lip sharp, arcuate, undulate by the ends of the spiral cords; anal sulcus short, pear shaped with no subsutural callus; body throat and pillar white, smooth, canal short, recurved. Height of shell, 27; of last whorl, 13; diameter, 8 mm. Cat. No. 212355, U.S.N.M.

Range.—Station 2824, near La Paz, Lower California, in 8 fathoms; U. S. Bureau of Fisheries steamer *Albatross*.

? CLATHRODRILLIA (LAEVITECTUM) EBURNEA Carpenter.

Plate 13, fig. 5.

Drillia eburnea CARPENTER, Proc. Zool. Soc. London, 1865, p. 280; not *Pleurotoma eburnea* Bonelli, 1842.

This differs from all the other species of the group in having all the sculpture obsolete, so that the shell except on very close scrutiny appears perfectly smooth except near the apex. The color is a pinkish white, with a brownish decollate apex. I have been puzzled where to put it, as it combines characters of several groups but feebly expressed.

Range.—Gulf of California, Rowell. Type, Cat. No. 22817, U.S.N.M.

? CLATHRODILLIA (KYLIX) ALCMENE, new species.

Shell small, pinkish white, polished, acute, with a flat-topped nucleus of two polished, prominently peripherally keeled whorls and about eight subsequent whorls; suture appressed, with a retractively nodulous, thickened band in front of it, forming the posterior margin of the anal fasciole; sculpture of (on the last whorl 22) somewhat sigmoid rounded ribs with subequal interspaces, reaching from

the suture over the whorl to the canal, constricted over the narrow anal fasciole and feebler on the anterior part of the last whorl; these ribs are cut into subnodulous segments by deep narrow sharp spiral grooves, with much wider interspaces, two or three on the spire, nine or ten between the fasciole and the canal on the last whorl; on the canal are five or six coarse close-set threads; aperture (probably not quite mature) rather narrow, anal sulcus narrow, not deep; outer lip thin, sharp, prominently arcuate; inner lip erased; pillar short, twisted, canal short, hardly differentiated. Height of shell, 13.5; of last whorl, 6.5; diameter, 5 mm. Cat. No. 268911, U.S.N.M.

Range.—Dredged at Agua Verde Bay, Gulf of California, by Dr. Paul Bartsch.

In the adult the aperture would doubtless be more elaborated.

? *CLATHRODRILLA* (*KYLIX*) *ALCYONE*, new species.

Plate 2, fig. 3.

Shell small, slender, acute, white, polished, with about nine whorls (the nucleus decorticated); suture distinct, not appressed, the anal fasciole adjacent to it with no thickened cord between; whorls well rounded but the fasciole flattish; spiral sculpture of (on the early whorls two, on the last whorl about 15) sharply incised lines in front of the shoulder cutting the ribs into squarish segments which are hardly nodulous; on the canal there are a few finer closet-set threads; axial sculpture of (on the penultimate whorl about 21) rounded somewhat sigmoid ribs, extending from the suture to the base, feeble on the fasciole and base and obsolete on the last half of the last whorl; anal fasciole wide and showing the arcuate posterior ends of the ribs which do not undulate the suture; aperture narrow, anal sulcus wide and rounded with slightly flaring edge; outer lip thin, sharp, prominently arcuately produced; inner lip erased, pillar strong, attenuated in front, canal distinct, narrow, somewhat recurved. Height of shell, 15; of last whorl, 8; diameter, 4.5 mm. Cat. No. 223150, U.S.N.M.

Range.—Station 3016, on the west coast of Mexico off Cape Lobos, in 76 fathoms, mud, bottom temperature 59° F. U. S. Bureau of Fisheries.

This species resembles *C. alemene*, but is more slender, less nodulous, and without the prominent band in front of the suture. It has every appearance of being adult, though it has not the characteristic *Clathrodrillia* aperture and color and should it prove that this is the normal condition these two species might form a distinct section characterized by the incised sculpture, simple aperture and more delicate shell, which might take the sectional name of *Kylix*. It is not certain that either species is operculate like the true *Clathrodrillia*. The present species might be regarded as the type. The name will date from 1918.

PSEUDOMELATOMA PENICILLATA Carpenter.

Plate 22, fig. 3.

Drillia penicillata CARPENTER, JOURN. de Conchyl., ser. 3, vol. 12, p. 146, April, 1865.

The poor condition of Carpenter's unfigured type specimen led to the belief that it was best to figure a perfect if somewhat immature example. The name has been variously applied, especially to forms of *Moniliopsis*, in ignorance of the true character of the species.

Range.—Cerros Island to Gulf of California.

CRASSISPIRA ERIGONE, new species.

Plate 7, fig. 8.

Shell solid, biconic, acute, olive brown with a purplish aperture; nucleus with two whorls, the first minute, smooth, rounded, the second with a peripheral keel, followed by eight sculptured whorls; suture appressed, obscure, behind a strongly constricted anal fasciole sculptured with almost microscopic spiral striae; other spiral sculpture of small obsolete threads covering the whole surface in front of the fasciole and three or four cords on the base of the last whorl widely separated and conspicuously nodulous where they cross the ribs; there are also 10 or more closer cords on the canal; axial sculpture of (on the spire about a dozen) short narrow ribs, very prominent and almost angular in front of the fasciole and on the last whorl extending nearly to the canal, with wider interspaces and not nodulous behind the base; the incremental lines are very fine and minutely crenulate the fine spiral sculpture in places; aperture narrow, anal sulcus short, rounded, with a strong subsutural callus; outer lip thin, smooth inside, moderately arcuate, with a hump-like varix behind it; inner lip and straight pillar with a thin layer of enamel, raised anteriorly at the edge; canal short, not deep, hardly differentiated from the aperture. Height of shell, 20; of last whorl, 12.5; diameter, 9 mm. Cat. No. 212368 U.S.N.M.

Range.—Station 2798, in Panama Bay, in 18 fathoms; U. S. Bureau of Fisheries.

CRASSISPIRA EURYNOME, new species.

Plate 7, fig. 5.

Shell small, slender, acute, dark brown with a whitish peripheral and a less obvious basal band; nucleus blunt, polished, reddish brown, of two whorls; subsequent whorls six, the anal fasciole on the spire depressed, very minutely spirally striated with a single fine thread near the posterior edge which is appressed at the suture; other spiral sculpture of fine striae and three stronger threads with

wider interspaces on the base; the canal has about half a dozen smaller closer threads; axial sculpture of nine oval prominent nodules on the periphery, which may in some specimens be bisected by an incised spiral line; the incremental lines are not prominent; aperture rather wide and short; anal sulcus large, deep, with a small subsutural callus; outer lip sharp edged, with a small varix, internally not lirate; canal short, wide, deep, with a perceptible siphonal fasciole and slightly recurved. Height of shell, 10; of last whorl, 5.5; diameter, 3 mm. Cat. No. 59345, U.S.N.M.

Range.—Beach at Acapulco, Mexico; W. H. Dall.

The specimen is slightly beach worn and the sculpture is probably sharper when fresh.

CRASSISPIRA CANDACE, new species.

Plate 6, fig. 6.

Shell small, pale purple with touches of brown, the nucleus lost, with about seven subsequent short whorls; suture appressed, obscure, behind a moderately impressed anal fasciole with a fine thread between them; other spiral sculpture of (on the spire) two peripheral close-set threads overriding the ribs; in front of these on the last whorl are two or three obscure broad flattish ridges with rather wide interspaces overridden by the axial sculpture, and on the canal a few rather sharp threads more closely set; axial sculpture of 10 or more short ribs on the penultimate whorl with narrower interspaces; on the last whorl there are about 13 smaller ribs extending nearly to the canal and reticulating the spiral sculpture; the incremental lines are rather marked; aperture wide and short, anal sulcus large, rounded, with a subsutural callus; outer lip thin-edged, prominent, with a large rounded varix behind it, within dark brown, smooth; inner lip simple, pillar very short, not callous, canal very short but distinct. Height of shell, 7; of last whorl, 3.5; diameter, 2 mm. Cat. No. 73929, U.S.N.M.

Range.—Gulf of California, Stearns collection.

This shell is so small and its sculpture so intricate that its description is not easy.

CRASSISPIRA APPRESSA Carpenter.

Plate 7, fig. 2.

Drillia appressa CARPENTER, *Ann. Mag. Nat. Hist.*, ser. 3, vol. 14, p. 45, July, 1864.

Range.—Cape San Lucas, J. Xantus. Cat. No. 4087, U.S.N.M.

CRASSISPIRA DIRCE, new species.

Plate 6, fig. 3.

Shell acute, dark brown (the nucleus lost) with about a dozen whorls, the spire acute, rather flat sided; axial sculpture only of faint

incremental lines, spiral sculpture of two prominent cords, the space between them wider than the space between either and the nearer suture; there is a third cord over which the suture is laid and appressed, sometimes left uncovered; the posterior cord is simple or only slightly undulated, the anterior is at first undulate and later develops spirally elongate keeled nodulations about ten to a whorl, on the last whorl there are three undulated and five simple cords, the nodules being usually lighter colored than the rest of the shell; the surface also has fine regular, close-set uniform spiral striation; aperture short, ovate, with smooth lips; outer lip somewhat varicose with a short, rounded anal sulcus and prominent parietal callus; canal hardly differentiated. Height of shell, 23.5; of last whorl, 12.5; diameter, 8.5 mm. Cat. No. 55461, U.S.N.M.

Range.—Panama, Stearns collection.

The reticulated marking on the figure is due to Polyzoa which have been removed.

CRASSISPIRA NEPHELE, new species.

Plate 7, fig. 1.

Shell small, biconic, acute, solid, black with the projecting sculpture yellow, with a rounded nucleus of one and a half smooth whorls and eight subsequent whorls; suture closely appressed, obscure, behind a series of very fine close threads (about four on the last whorl) followed by a very strong yellow cord which on most of the spire forms the periphery, in front of this cord is the moderately constricted anal fasciole similarly threaded; in front of this is (on the spire one, on the last whorl two) a series of yellow nodules (about a dozen on the last whorl) rather distant from one another and connected by a small yellow cord, like beads on a string; the two series on the last whorl are close together, only separated by a much smaller thread, giving a dumb-bell shape to the nodules; in front of this pair on the last whorl are four distant yellow threads with single nodules placed in harmony with the larger ones above mentioned and half a dozen finer threads on the canal; the interspaces between the threads are finely threaded like the fasciole, and are often minutely decussated by the incremental lines which form the only axial sculpture; aperture narrow, anal sulcus shallow, rounded, with a subtural callus; inner lip smooth, erased, pillar callous, smooth, canal short, wide, hardly differentiated from the aperture. Height of shell, 13; of last whorl, 7.5; diameter, 5 mm. Cat. No. 55472, U.S.N.M.

Range.—Panama, Stearns collection.

This species seems by coloration and sculpture different from the numerous other forms of this group which swarm at Panama, but

the range of variation requires thorough investigation before one can be certain of the specific status of any of them.

CRASSISPIRA EPICASTA, new species.

Plate 7, fig. 4.

Shell small, slender, acute, black, or very dark reddish brown, with two smooth nuclear whorls, the second with a peripheral keel, and seven subsequent whorls; suture obscure, appressed, with a marked thread at its edge; spiral sculpture of fine spiral striae over the entire shell, and (on the spire two or three, on the last whorl eight) stronger cords undulated but not nodulated where they pass over the axial sculpture, and separated by wider interspaces; the anal fasciole hardly constricted; axial sculpture of fine sharp incremental lines cutting the minor spirals and, on the last whorl about 13 low rounded ribs extending from the fasciole nearly to the canal but not conspicuous anywhere, with equal or narrower interspaces; aperture small, dark brown, the anal sulcus shallow and the thin outer lip only moderately arcuate; inner lip and pillar simple, canal short, hardly differentiated from the aperture. Height of shell, 9; of last whorl, 4.5; diameter, 3.5 mm. Cat. No. 204102, U.S.N.M.

Range.—Beach of Taboguilla Island, Panama Bay; U. S. Bureau of Fisheries.

CRASSISPIRA BRIDGESI, new species.

Plate 7, fig. 7.

Shell small, solid, grayish, with six whorls exclusive of the (lost) nucleus; suture strongly appressed, obscure with a thread-like edge in front of which is a narrow spirally striated space bordered in front by a larger cord forming the posterior margin of the anal fasciole; the fasciole is strongly constricted, undulated by the ribs and spirally striated; other spiral sculpture of (on the upper whorls one, on the later two) peripheral cords which are swollen where they pass over the ribs and on the anterior of which the suture is laid; on the last whorl there are six such cords with much wider spirally striated interspaces, and about five closer threads on the canal; axial sculpture of (on the last whorl six) strong rounded ribs almost continuous up the spire, most prominent at the periphery and feeble on the base; aperture narrow, with a varicose rib behind it; anal sulcus short, with a strong subsutural callus, inner lip erased, pillar with a thin layer of callus, smooth, short, with a very short deep canal forming an evident siphonal fasciole. Height of shell, 11; of last whorl, 5.5; diameter, 5 mm. Cat. No. 55254, U.S.N.M.

Range.—Panama, in the Stearns collection, collected by Thomas Bridges.

This shell, being somewhat bleached, is probably of a darker color when fresh.

CRASSISPIRA BACCHIA, new species.

Plate 6, fig. 1.

Shell solid, biconic, acute, slate gray with whitish projections; nucleus (eroded) of two brownish whorls, apparently smooth, and nine subsequent whorls; suture distinct, appressed, bordered by a small thread behind and a strong white cord in front between it and the fasciole which is constricted narrow and minutely spirally striated; other spiral sculpture of (on the spire two) peripheral whitish cords, the anterior stronger and swollen where it passes over the ribs; on the last whorl in front of the periphery are seven similar but smaller cords with wider, minutely striated interspaces sometimes carrying an intercalary thread; on the canal are about half a dozen close-set threads; axial sculpture of (on the last whorl 10) short rounded ribs prominent only on the periphery and extending from the fasciole to the canal, with subequal interspaces; there is also a prominent rounded varix behind the outer lip; outer lip sharp edged, smooth internally; anal sulcus conspicuous, rounded, short, with a strong subsutural callus; inner lip erased, dark purple as well as the throat; pillar straight, short, canal hardly differentiated from the aperture. Height of shell, 14.5; of last whorl, 7.5; diameter, 5.5 mm. Cat. No. 212372, U.S.N.M.

Range.—Station 2824, off La Paz, Lower California, in 8 fathoms, sandy bottom. U. S. Bureau of Fisheries.

It is quite likely that the color of this species varies and may be darker or lighter.

CRASSISPIRA TEPOCANA, new species.

Plate 6, fig. 5.

Shell solid, livid purple under a very dark olive periostracum, of about six whorls exclusive of the (lost) nucleus; suture strongly appressed behind a constricted anal fasciole; spiral sculpture of (on the penultimate whorl about nine) strong flattish threads, equal all over the surface and without intercalary striae; having narrower interspaces on the spire and equal or wider ones on the last whorl; axial sculpture of (on the last whorl about 10) sharp edged narrow nearly straight ribs reaching nearly to the canal from the fasciole, with much wider interspaces; aperture narrow, dark purple; anal sulcus rounded, short, with a strong subsutural callus; outer lip thin, slightly arcuate, smooth within, having a feeble varix behind it; inner lip with a thick layer of enamel, having a raised edge anteriorly; canal short hardly differentiated from the aperture; siphonal sulcus deep, forming an evident fasciole. Height of shell, 19; of last whorl, 12; diameter, 8 mm. Cat. No. 224415, U.S.N.M.

Range.—Station 3018, off Cape Tepoca, Lower California, in 36 fathoms, sand, bottom temperature 63.3° F.; U. S. Bureau of Fisheries.

CRASSISPIRA ARSINOË, new species.

Plate 6, fig. 4.

Shell biconic, acute, dark brown with paler projections and a reddish brown nucleus of two smooth whorls followed by nine subsequent whorls; suture closely appressed, obscure, somewhat undulated with two fine threads and a garland of elongated paler nodules between it and the constricted spirally grooved anal fasciole; other spiral sculpture of on the last whorl sharp narrow channeled grooves with wider flattish interspaces, which cut the axial sculpture into nodules, there are half a dozen closer threads on the canal; there is apart from the fasciole no finer spiral striation such as is found in most of the species of the group; axial sculpture of (on the last whorl about 14) feeble ribs beginning at the fasciole, obsolete on the base and only prominent as single, double, or triple nodules at the shoulder, there are four or five rather distant spiral rows of nodules between the shoulder and the canal; the incremental lines are very fine and sharp; aperture narrow, anal sulcus wide and shallow with a marked subsutural callus; outer lip thin sharp, smooth inside, with no very evident varix behind it; throat brownish, inner lip and pillar with a smooth layer of enamel, the anterior edge raised on the canal; the latter short wide, hardly differentiated from the aperture. Height of shell, 17; of last whorl, 9.5; diameter, 7.5 mm. Cat. No. 56135, U.S.N.M.

Range.—Bartolomé Bay, Lower California, H. Hemphill.

? **CRASSISPIRA RUGITECTA Dall.**

Plate 7, fig. 6.

Turris (*Crassispira*) *rugitecta* DALL, Proc. U. S. Nat. Mus., vol. 54, No. 2134, p. 226, April 5, 1918.

Shell solid, acute, dark reddish brown, with a pale peripheral band and eleven rapidly enlarging whorls exclusive of the (lost) nucleus; suture closely appressed, obscure, with four or five strong spiral cords between it and the anterior edge of the anal fasciole which is moderately constricted; between this and the succeeding suture are five or six rather close-set flattish cords, obsolete on the summits of the ribs, the whole surface polished; on the last whorl there are about 14 of these cords extending to the canal near which there are a few intercalary smaller cords but no fine spiral striation; axial sculpture of (on the last whorl 16) nearly vertical ribs with narrow interspaces, beginning abruptly in front of the fasciole and becoming obsolete on the base; incremental lines rather strong; anal sulcus wide, rounded, not deep, separated from the suture by a strong

cord; aperture reflecting the colors of the exterior; outer lip short, sharp, arcuate; pillar and body smooth, canal very short, a little recurved. Height of shell, 30.5; of last whorl, 16; diameter, 10. mm. Cat. No. 266911, U.S.N.M.

Range.—San Bartolomé Bay, Lower California, Dr. Paul Bartsch.

This elegant species appears to be a *Crassispira*, but lacks the fine spiral striation and black color characteristic of the latter group.

? *CRASSISPIRA AMATHEA*, new species.

Plate 6, fig. 2.

Shell solid, marbled with brown and white, the brown chiefly as a broad dark peripheral band with a narrower band just behind the canal; nucleus blunt, brown, of two smooth whorls, followed by about six subsequent whorls, suture obscure, appressed, with a strong whitish ridge in front of it behind a rather wide constricted fasciole; spiral sculpture of fine striae covering the whole surface; axial sculpture of (on the last whorl about a dozen) short ribs extending from the fasciole to the canal and most prominent at the shoulder, with three nodules on the basal part of each rib; on the spire they are more like nodules than ribs; aperture wide, outer lip thickish, with a feeble varix behind it; anal sulcus distinct, shallow, with a large subsutural callus; inner lip with a moderate layer of enamel the anterior edge of which near the canal is raised, with a chink between it and the siphonal fasciole; canal wide, deep, very short, constricted, with a well marked siphonal fasciole. Height of shell, 22; of last whorl, 12; diameter, 8 mm. Cat. No. 56099, U.S.N.M.

Range.—Purchased from a native at Acapulco, Mexico, by W. H. Dall.

The shell is polished, but this may be due to the manner in which it has been cleaned by the seller.

? *CRASSISPIRA MARTINENSIS*, new species.

Plate 13, fig. 4.

Shell brownish, with two smooth nuclear and seven subsequent whorls; suture distinct, with a strongly nodulous ridge between it and the anal fasciole which is retractively arcuately wrinkled; the body is strongly sculptured with about a dozen rounded cords with narrower interspaces, not swollen where they pass over (on the penultimate whorl 14) close rounded ribs which extend to the periphery and are obsolete beyond it; aperture defective. Height, 18; of last whorl, 12; diameter, 8 mm. Cat. No. 162669, U.S.N.M.

Range.—Gulf of California at Cape San Martin.

MONILIOPSIS GRIPPI, new species.

Plate 8, fig. 2.

Shell slender with about eight (slightly decollate) whorls, livid olivaceous with a pale peripheral band, lighter near the aperture;

suture appressed, on the upper whorls rudely nodulous; spiral sculpture in front of the fasciole on the spire of five or six strong cords with narrower interspaces, overriding the ribs; the cords cover the last whorl, feebler on the periphery, coarser on the base; there are also faint spiral striae here and there; axial sculpture on the upper part of the spire 14 or 15 strong rounded ribs with wider interspaces, feebler on the penultimate, obsolete on the last whorl; aperture ovate, anal sulcus conspicuous, shallow; outer lip thin, simple, inner lip smooth, canal short, wide, not recurved. Height of shell, 27; of last whorl, 16; diameter, 10 mm. Cat. No. 203670, U.S.N.M.

Range.—San Diego, California; collected by the late C. W. Gripp.

Verging toward *Clathrodrillia*, but nearer to such species as *Moniliopsis cancellata* Carpenter.

MONILIOPSIS FANCHERAE Dall.

Plate 8, fig. 3.

Mangilia fancherae DALL, Proc. Biol. Soc. Wash., vol. 16, p. 172, Dec., 1903.

Though so small this is allied to the larger species here referred to as *Moniliopsis* by its sculpture and the presence of an operculum, which was lost in the specimen originally described.

Range.—Santa Barbara Channel, California, to Point Abrejos, Lower California.

MONILIOPSIS RHINES Dall.

Plate 8, fig. 5.

Drillia cancellata CARPENTER, Proc. Acad. Nat. Sci. Phila. for 1865, p. 63, 1865; not of J. Sowerby, 1827.

Surcula rhines DALL, Proc. U. S. Nat. Mus., vol. 24, No. 1610, p. 248, June 16, 1908.

Range.—Puget Sound to San Diego, California.

MONILIOPSIS OPHIODERMA Dall.

Plate 12, fig. 5.

Pleurotoma incermis HINDS, Voy. *Sulphur*, Moll., p. 16; Proc. Zool. Soc. London, p. 37, 1843; Zool., pl. 5, fig. 7, 1844; not of Partsch, 1842.

Surcula ophioderma DALL, Proc. U. S. Nat. Mus., vol. 34, No. 1610, p. 247, June 16, 1908.

Range.—San Pedro to Ballenas Lagoon, Lower California.

MONILIOPSIS INCISA Carpenter.

Plate 12, fig. 7.

Drillia incisa CARPENTER, Proc. Acad. Nat. Sci. Phila. for 1865, p. 62, 1865; not *Pleurotoma incisa* of Reeve, 1843.

Range.—Virago Sound, British Columbia, to San Pedro, California. Differs from *incermis* only by deeper and coarser grooving.

MONILOPSIS HALCYONIS DALL.

Plate 8, fig. 1.

Turris (Surcula) halcyonis DALL, Proc. U. S. Nat. Mus., vol. 34, No. 1610, p. 248, June 16, 1908.

Range.—Monterey to San Diego, California.

SUAVODRILLIA WILLETTI, new species.

Shell small, white, with a pale operculum with apical nucleus; nuclear whorls translucent white, glassy, inflated, about one and a half in number, then gradually passing into the reticulate sculpture of the five or six subsequent turns; suture appressed with one or two close-set prominent spiral threads in front of it; whorls sloping forward flatly from these threads to an angle at the shoulder forming the periphery, this part of the whorl minutely spirally threaded; other spiral sculpture of (on the base about five) strong threads with wider interspaces containing minor threads all merging toward and on the canal into a series of subequal close-set threads; the anal fasciole has its deepest part at the shoulder angle, but the arcuate incremental lines on the whorl behind the angle indicate that it was when complete wide and shallow; axial sculpture of (on the penultimate whorl about 16) strongly protractive short ribs starting at the shoulder, which they slightly nodulate, and reaching to the suture, but obsolete on the last whorl and not reaching much beyond the periphery; outer lip thin, sharp; inner lip erased; pillar short, obliquely attenuated in front; canal short, distinct, slightly recurved. Height of shell, 10; of last whorl, 5; diameter, 4.5 mm. Cat. No. 216409, U.S.N.M.

Range.—Forrester Island, southeastern Alaska, G. Willett.

This shell belongs to the group of which "*Drillia*" *kennicottii* Dall, is the most conspicuous example and which serves as the typical species.

BELLASPIRA MELEA, new species.

Plate 19, fig. 8.

Shell stout, rose pink, with a whitish band in front of the suture, with a blunt smooth nucleus of about one whorl and about five subsequent whorls; suture appressed, obscure, spiral sculpture apparently absent; axial sculpture of (on the last whorl six) strong, stout, wavelike ribs, continuous up the spire, with wide interspaces, and practically vertical; the surface appears to be smooth but as the specimen is slightly beach worn some minute sculpture may have disappeared; the suture is undulated by the ribs, there is no anal fasciole perceptible; anal sulcus narrow, short, with a subsutural callus in front of it; outer lip thin, sharp, with a marked varicose swelling behind it; there are no internal lirae; inner lip callous, smooth;

pillar very short, stout, and straight; canal hardly differentiated from the aperture but deeply cut; height of shell, 12; of last whorl, 7.5; diameter, 5 mm. Cat. No. 15952, U.S.N.M.

Range.—Panama, Col. E. Jewett.

This is a very solid little shell and of a very attractive color. It is a typical *Bellaspira*.

? HAEDROPLEURA MELITA, new species.

Plate 24, fig. 7.

Shell small, slender, waxen white, with an obscure purple band in front of the suture and the region of the canal dark purple, when fresh; nucleus of two and a half gradually enlarging whorls, the first smooth, the last more or less axially minutely ribbed, and five subsequent whorls; axial sculpture of (on the last whorl) eight rather sharp ribs extending from the suture (which they undulate) to the region of the canal and continuous up the spire in a direct line with somewhat wider interspaces; suture distinct, appressed; spiral sculpture of fine uniform evenly spaced rounded threads, not swollen where they cross the ribs, a single thread at the shoulder is more prominent but not larger than the others, from which and from the suture it is separated by a space devoid of the spiral sculpture which elsewhere covers the surface; the ribs are shortly arcuate when passing over the otherwise obscure anal fasciole, and the depressions between them, the suture and the shoulder are markedly excavated; aperture narrow, anal sulcus conspicuous, rounded not deep; outer lip strongly varicose, not internally lirate, inner lip smooth, pillar short, straight, canal short, hardly differentiated from the aperture. Height of shell, 5.2; of last whorl, 3; diameter, 2 mm. Cat. No. 266436, U.S.N.M.

Range.—Agua Verde Bay, Gulf of California, Dr. Paul Bartsch.

The shell, though fresh, is without the soft parts, and therefore it can not be determined whether it is operculate or not.

CRYPTOGEMMA POLYCASTE, new species.

Plate 9, figs. 4, 7.

Shell white, with a pale olivaceous periostracum, and five whorls exclusive of the (lost) nucleus, rather slender and moderately rounded except for a single strong peripheral keel which marks the deepest part of the anal sulcus; suture distinct, not appressed, with a feebly indicated flattish area between it and the posterior edge of the anal fasciole, which between the keel and the flattening is slightly impressed; there is no other spiral sculpture and the axial sculpture consists mostly of moderately prominent incremental lines; anal sulcus deep and wide; outer lip thin, prominently arcuately produced; inner lip smooth, pillar very short, gyrate; axis pervious; canal pro-

duced, narrow, slightly recurved. Height of shell, 14; of last whorl, 9; diameter, 5.5 mm. Cat. No. 212332, U.S.N.M.

Range.—Station 3346, off Tillamook Bay, Oregon, in 786 fathoms, ooze, bottom temperature 37.3° F. U. S. Bureau of Fisheries.

CRYPTOGEMMA CHRYSOTHEMIS, new species.

Plate 11, fig. 2.

Shell short-fusiform, white, with a pale olive periostracum, the tip eroded, with six or more subsequent whorls; the suture distinct, the anal sulcus shallow, somewhat removed from the suture, the fasciole narrow, depressed; spiral sculpture of a low blunt peripheral keel, somewhat undulated on the earlier whorls with occasional traces of minor spiral threads; the entire surface is more or less obliquely granulose or minutely vermiculate; axial sculpture only of feeble incremental lines; outer lip thin, sharp, produced; inner lip erased; pillar short, obliquely attenuated in front; canal short, wide, not recurved; axis not pervious. Height of (eroded) specimen, 16.5; of last whorl, 11; diameter, 7.5 mm. Cat. No. 208908, U.S.N.M.

Range.—Station 4405, between San Clemente and Santa Catalina Islands, California, in 654 to 704 fathoms, mud, temperature 39°.4 F. U. S. Bureau of Fisheries.

CRYPTOGEMMA CALYPSO, new species.

Plate 9, fig. 8.

Shell small, the nucleus always eroded, whitish with a dark dull olivaceous periostracum and about five remaining whorls; suture appressed, with a broad smooth ridge in front of it and behind the excavated anal fasciole; spiral sculpture in front of the shoulder of fine even close-set equal threads, covering the surface, including the canal; axial sculpture of feeble incremental lines arcuate on the fasciole and antesutural ridge, also of narrow low sigmoid ribs beginning and forming a shoulder in front of the fasciole and obsolete in front of the periphery, differing in strength in different individuals and averaging fourteen on the last whorl; anal sulcus wide and deep, rounded; outer lip thin and sharp, much produced; inner lip with a thin layer of callus; pillar straight, short, obliquely attenuated in front; axis impervious; canal distinct, wide, hardly recurved. Height of (decollate) shell, 11; of last whorl, 7; diameter, 4.7 mm. Cat. No. 214067, U.S.N.M.

Range.—Station 2923, off San Diego, California, in 822 fathoms, mud, temperature at bottom 39° F. U. S. Bureau of Fisheries.

CRYPTOGEMMA CYMOTHOË, new species.

Plate 9, fig. 3.

Shell much resembling the preceding species, from which it differs by having the anal fasciole striated spirally, the surface in front of

the shoulder without spiral sculpture and minutely vermiculate, the ribs more knob-like, shorter, and averaging about 12 on the last whorl; whorls about six in number, the apex always eroded. Height of (decollate) shell, 9; of last whorl, 6.5; diameter, 5 mm. Cat. No. 214067a, U.S.N.M.

Range.—Station 2923, off San Diego, California, in 822 fathoms, mud, temperature at bottom 39° F. U. S. Bureau of Fisheries.

CRYPTOGEMMA QUENTINENSIS, new species.

Plate 9, fig. 9.

Shell small, solid, white under an olivaceous periostracum, having five (decollate) whorls, suture distinct, bordered by a rounded ridge on each side; surface dull; spiral sculpture of a prominent nodulous peripheral ridge which is the anal fasciole, with two smaller ridges in front of it with wider interspaces; in front of the first of these the suture is laid; the space between this and the second is more or less channeled, but these two ridges are not nodulous; in front of these four or five obscure threads appear on the canal; axial sculpture of strong retractive wrinkles at the suture, which become arcuate nodulous riblets on the fasciole and dwindle protractively in front of it; there are also more or less obvious incremental lines; aperture moderate, simple, the axis pervious, the columella short, attenuated in front; canal short, slightly recurved, operculum narrow, with apical nucleus. Height of shell, 12; of last whorl, 9; diameter, 5 mm. Cat. No. 209417, U.S.N.M.

Range.—Off Cape San Quentin, Lower California, in 359 fathoms.

CRYPTOGEMMA ANTIGONE, new species.

Plate 11, fig. 4.

Shell solid, white, with an olivaceous periostracum, spire badly eroded, short, indicating a total of five whorls exclusive of the nucleus, the last whorl and a half alone retain their normal condition; suture distinct, not appressed; anal fasciole narrow, constricted, separated from the suture by an obscure ridge; in front of the fasciole is an undulated rounded ridge from which extend obliquely protractive obscure riblets more or less obsolete on the last whorl, probably stronger and more distinct on the spire when not eroded; there is also very obscure spiral grooving with much wider interspaces on the base; the entire surface is minutely irregularly vermiculate; aperture narrow; anal sulcus shallow, rounded, close to the suture; outer lip thin, sharp, moderately produced; inner lip erased, pillar short, white, obliquely attenuated in front; canal short, wide, hardly differentiated. Height of (decollate) shell, 23; of last whorl, 18; diameter, 10 mm. Cat. No. 214066b, U.S.N.M.

Range.—Station 2922, off San Diego, California, in 822 fathoms, mud, bottom temperature 39° F. U. S. Bureau of Fisheries.

This shell resembles a *Borsonella* so much that I was not satisfied of its true position until by grinding off part of the back the pillar was shown to be quite destitute of plication.

CRYPTOGEMMA ADRASTIA, new species.

Plate 19, fig. 2.

Shell white, with a thin, pale olive periostracum, the apex invariably eroded, and the subsequent whorls, eight or more, polished and faintly showing incremental lines; suture inconspicuous, the anterior margin sometimes raised like a small cord; spiral sculpture of a strong, sometimes nodulous or undulated peripheral keel, rather nearer the succeeding suture than to the preceding one, the latter space occupied by the slightly concave anal fasciole; axial sculpture only of arcuate incremental lines; base rounded; aperture narrow, outer lip thin, sharp, produced, internally smooth; anal sulcus wide and shallow, with no parietal nodule; inner lip erased; pillar smooth, twisted, not pervious, attenuated obliquely toward the rather long, slightly recurved canal. Height of decollate specimen of about five whorls, 16; of last whorl, 11.7; diameter, 6.25 mm. Cat. No. 226154, U.S.N.M.

Range.—Station 3670, Monterey Bay, California, in 581 fathoms, mud, temperature 37.8° F.; U. S. Bureau of Fisheries.

ANTIPLANES AGAMEDEA, new species.

Plate 24, fig. 2.

Shell small, white, covered with an olivaceous periostracum, with more than five whorls, apex eroded, the periphery with a rounded keel; spiral sculpture of a thickened flattish ridge in front of the channeled suture, and obscure spiral threading on the impressed anal fasciole and base, the canal smooth; axial sculpture of fine incremental lines more or less reticulating the spirals and arcuate over the fasciole, the peripheral keel on the spire nearer the succeeding than the preceding suture; aperture elongate, the outer lip thin, smooth within, arcuately produced in front of the fasciole; inner lip erased, pillar short, solid, obliquely attenuated in front, straight. Height of four whorls, 10.5; of last whorl, 8; diameter, 5 mm. Cat. No. 211759, U.S.N.M.

Range.—Station 2936, off Cape San Quentin, Lower California, in 359 fathoms, mud, bottom temperature 49° F. U. S. Bureau of Fisheries.

ANTIPLANES KAMCHATICA, new species.

Plate 10, fig. 1.

Shell sinistral, large, coarse, with a shining brown periostracum over a yellowish substratum, the suture distinct, the spire acute. the

whorls moderately rounded; axial sculpture only of sigmoid lines of growth, with six whorls exclusive of the nucleus and about a whorl and a half of the apex which are missing; spiral sculpture of fine close subequal striations with slightly wider interspaces, covering the whole surface; aperture wide, the outer lip sinuous, simple, the anal sulcus shallow, the canal wide and short. Height of shell, 51; of last whorl, 32; diameter, 27 mm. Cat. No. 225255, U.S.N.M.

Range.—Western Bering Sea and the southeast coast of Kamchatka in 100 fathoms, pebbly bottom, temperature 31.7° F. U. S. Bureau of Fisheries steamer *Albatross*.

This is the largest species of the genus and follows the rule that the species of the Asiatic side of Bering Sea are larger and coarser than their analogues of the American shore.

ANTIPLANES BULIMOIDES, new species.

Plate 11, fig. 7.

Shell elongate, decollate, whorls six or more, four distinctly remaining, suture distinct, not appressed, whorls moderately convex, smooth, with a pale polished greenish periostracum over a white substratum, in spots minutely granulose, apparently from some wrinkling of the periostracum; anal sulcus wide, shallow, hardly forming a fasciole; outer lip thin, sharp, moderately produced; inner lip with a thin white layer of callus; pillar straight, with an anterior oblique attenuation; canal wide, hardly differentiated; length of three complete whorls, 31; of last whorl, 23; diameter at apex, 5; maximum diameter, 15 mm. Cat. No. 111051, U.S.N.M.

Range.—Station 4772, on Bowers Bank, Bering Sea, in 344 fathoms, sand, bottom temperature 38.1° F. U. S. Bureau of Fisheries.

The bulimoid shape and glistening greenish periostracum make this species quite unique.

ANTIPLANES LITUS, new species.

Plate 11, fig. 1.

Shell slender, white, acute, with seven or eight moderately convex whorls separated by a very distinct suture; nucleus swollen, twisted, of two whorls, the second spirally threaded; on about three of the subsequent whorls these threads are developed into two or three major cords between the periphery and the suture, becoming on later whorls obsolete, or this sculpture in other specimens may be obsolete; there is also a semiobsolete fine spiral striation covering the whole surface and somewhat stronger on the canal; there is no axial sculpture; aperture narrow, anal sulcus feeble, close to the suture hardly forming a fasciole; outer lip thin, slightly produced; inner lip erased; pillar straight, canal short, wide. Height of shell, 16; of last whorl, 9; diameter, 5 mm. Cat. No. 206602, U.S.N.M.

Range.—Station 3194, off Esteros Bay, California, in 92 fathoms, sand, temperature 45.9° F. U. S. Bureau of Fisheries.

ANTIPLANES ABARBAREA, new species.

Plate 9, fig. 5.

Shell whitish, acute, with one globular nuclear and six and a half subsequent, well-rounded whorls; suture distinct, not appressed; spiral sculpture of faint obscure grooves with wider interspaces over the whole spire but obsolete on the last whorl, and a series of faint irregular peripheral nodulosities on the upper part of the spire; axial sculpture of rather coarse, irregular incremental lines, retractively arcuate in front of the suture, though there is no distinct fasciole; aperture elongate, anal sulcus close to the suture, rather deep; outer lip thin, smooth inside; inner lip erased; pillar straight, smooth, attenuated in front; canal short, wide, nearly straight. Height of shell, 21.5; of last whorl, 13.5; diameter, 8 mm. Cat. No. 224393, U.S.N.M.

Range.—Station 2954, off Santa Rosa Island, California, in 55 fathoms, shelly bottom, temperature 55.4° F. U. S. Bureau of Fisheries.

This specimen, though complete, has lost its periostracum and the nucleus is slightly eroded.

ANTIPLANES BRISEIS, new species.

Plate 22, fig. 1.

Shell elongate, acute, white, covered with a very pale olivaceous periostracum, with a blunt swollen nucleus of about a whorl and a half (eroded) and eight subsequent rather flattish whorls; suture obscure, appressed; spiral sculpture of one or two feeble flattish cords between the periphery and the succeeding suture on the spire, and on the last whorl about twice as many more or less obsolete; axial sculpture of rather prominent, deeply arcuate incremental lines; anal fasciole wide, not impressed, the deepest part of the sulcus near the periphery; aperture narrow, outer lip thin, sharp, much produced; inner lip and pillar erased, the latter short, straight, obliquely attenuated in front; canal distinct, produced, straight. Height of shell, 18; of last whorl, 10; diameter, 5 mm. Cat. No. 212329, U.S.N.M.

Range.—Station 3179, off Drakes Bay, California, in 30 fathoms, mud, temperature 50° F. U. S. Bureau of Fisheries.

ANTIPLANES HYPERIA, new species.

Plate 9, fig. 6.

Shell with more than six hardly rounded whorls (decollate), white, with a dark olive periostracum, the base white; suture appressed, distinct, the whorl in front of it constricted; spiral sculpture of (on the last whorl) a sharp thread or low keel above the periphery, two

more at the periphery; on the anterior one the suture is laid and it also forms the anterior boundary of the dark coloration; on the base are about five less conspicuous threads; all these have much wider interspaces; axial sculpture of moderately conspicuous incremental lines; anal sulcus wide and extremely shallow, the deepest portion at the posterior keel; there is no well defined fasciole; aperture short and wide, outer lip thin, only slightly produced in front of the sulcus; inner lip erased; pillar very short; canal very short and wide, but distinct, slightly recurved and with an inconspicuous siphonal fasciole. Height of five whorls, 12; of last whorl, 7; diameter of decollation, 1.7; of last whorl, 4.5 mm. Cat. No. 212329a, U.S.N.M.

Range.—Station 3179, off Drakes Bay, California, in 30 fathoms, mud, bottom temperature 50° F. U. S. Bureau of Fisheries.

This form might be taken for a variety of *A. briseis*, but is distinguished by its more emphatic and somewhat different sculpture, its white base, and the short pillar and canal. The anal sulcus is much more shallow and the outer lip less produced.

ANTIPLANES AMYCUS, new species.

Plate 11, fig. 5.

Shell white, covered with a brownish olive periostracum; with five or more moderately rounded whorls exclusive of the (lost) nucleus; suture distinct with a wide rounded ridge in front of it, forming the posterior boundary of the anal fasciole; spiral sculpture of a few obscure threads on the fasciole and in front of the shoulder 8 or 9, on the last whorl 15 to 18 flattish, rather close-set threads smaller and closer anteriorly and absent from the canal; axial sculpture of more or less distinct incremental lines, and on the upper spire of about 15 very oblique anteriorly protracted riblets chiefly visible at the shoulder and obsolete on or entirely absent from the last two whorls; anal sulcus wide, deep, rounded, the fasciole slightly impressed; outer lip thin, sharp, arcuately produced; inner lip erased, pillar short, white, obliquely attenuated in front; canal short, wide, distinct, slightly recurved. Height of four whorls, 21.5; of last whorl, 15; diameter at decollation, 3; of last whorl, 9.5 mm. Cat. No. 226163, U.S.N.M.

Range.—Station 3670, in Monterey Bay, California, in 581 fathoms, mud, bottom temperature 37.8° F. U. S. Bureau of Fisheries.

ANTIPLANES SANTAROSANA Dall.

Plate 11, fig. 3.

Pleurotoma (Antiplanes) santarosana DALL, Proc. U. S. Nat. Mus., vol. 24, No. 1264, p. 515, March, 1902.

Range.—Off Santa Rosa Island, California, in 53 fathoms, sand.

ANTIPLANES AMPHITRITE, new species.

Plate 9, fig. 1.

Shell white, covered with a pale olivaceous periostracum, of five or more well-rounded whorls exclusive of the (lost) nucleus, having a rounded shoulder and distinct not appressed suture; axial sculpture of, on the spire, obscure nodulations at the shoulder (about 15 on the penultimate whorl) which do not form ribs and are absent from the last whorl; incremental lines fine but obscure; beside these there are minute, anteriorly obliquely retractive lines somewhat microscopically reticulated by the lines of growth; there is no spiral sculpture except on some specimens a few obsolete lines on the base; anal sulcus shallow, slightly removed from the suture, the fasciole lightly impressed on the last whorl; aperture narrow, the outer lip thin, sharp, arcuately produced; inner lip erased, pillar white, solid straight, anteriorly obliquely attenuated; canal wide, straight, distinct. Height of five whorls, 13.5; of last whorl, 10; diameter, 6mm. Cat. No. 209953, U.S.N.M.

Range.—Station 4415, off Santa Barbara Island, California, in 638 fathoms, muddy bottom; U. S. Bureau of Fisheries. Also a variety *beroë* at Station 2923 off San Diego, California, in 822 fathoms, mud, bottom temperature 39°.

ANTIPLANES AMPHITRITE BEROË, new variety.

The variety differs in being larger, with the suture appressed, the fasciole close to it, and bearing three or four spiral grooves; height of four whorls, 19; of last whorl, 14; diameter at decollation, 2.5; of last whorl, 9 mm. Cat. No. 21466a, U.S.N.M.

ANTIPLANES THALAEA Dall.

Plate 11, fig. 6.

Pleurotoma (Antiplanes) thalaea DALL, Proc. U. S. Nat. Mus., vol. 24, No. 1264, p. 514, March, 1902.

Range.—Off San Luis Obispo, California, in 252 fathoms, and north to the Aleutian Islands.

BORSONELLA BARBARENSIS, new species.

Plate 12, fig. 6.

Shell solid, of six or more whorls, the apex decollated, the periostracum greenish olive over a white substratum, yellowish on the pillar; suture distinct with a convex spiral band between it and the fasciole; spiral sculpture of a pronounced keel in front of the fasciole, on the upper part of the spire this keel may be more or less undulated; in front of the keel the surface is retractively somewhat irregularly obliquely grooved, with wider flattish interspaces upon which

is a minute protractively looped sculpture giving a vermicular aspect to the surface under a magnifier; aperture ovate, simple, the outer lip thin and sharp, the anal sulcus wide and moderately deep. the pillar straight, attenuated in front, the plait hidden behind it, the canal short and wide, the operculum missing. Height of shell, 29; of last whorl, 20; diameter, 12 mm. Cat. No. 96841, U.S.N.M.

Range.—Off Santa Barbara Island, California, in 302 to 614 fathoms, sand, bottom temperature 41.4° F. U. S. Bureau of Fisheries steamer *Albatross*.

In these species the plait on the pillar is generally hidden behind the pillar so as to be invisible from a front view of the aperture.

BORSONELLA NYCHIA, new species.

Plate 12, fig. 2.

Shell white with an olivaceous periostracum, biconic, acute, the nucleus (eroded) of one or two whorls, with about six subsequent whorls, rapidly enlarging, flatly descending from a distinct, not appressed suture to the periphery and with the last whorl conically attenuated in front; spiral sculpture of an obscure thickening in front of the suture, fine rather irregular striae thence to the periphery, crossed obliquely by irregular scratches, a prominent angle at the periphery which on the spire is just behind the suture, and on the last whorl is ornamented with nine or ten prominent nodules with wider interspaces; on the base the striae are coarser and more irregular, the interspaces assuming the form of (about 15) flattish threads, sparser on the canal; axial sculpture of fine incremental lines arcuate on the anal fasciole; aperture elongate triangular, the anal sulcus very wide and shallow, outer lip thin, sharp, smooth within, arcuate in front of the periphery; inner lip erased, pillar solid, short with a single plication near the body, attenuated in front, straight; canal hardly differentiated, somewhat produced. Height of shell, 12; of last whorl, 8; diameter, 5.5 mm. Cat. No. 208891, U.S.N.M.

Range.—Station 4361, off Point Loma, California, in 101 fathoms, sandy bottom; U. S. Bureau of Fisheries.

BORSONELLA OMPHALE, new species.

Plate 12, fig. 4.

Shell slender, acute, with eight flattish whorls exclusive of the (lost) nucleus, white covered by a very light olive gray periostracum; suture distinct, fasciole hardly impressed; spiral sculpture of obscure striae, sparser on the base; axial sculpture of incremental faint lines arcuate on the anal fasciole; aperture narrow, anal sulcus wide, moderately deep; outer lip thin, prominently arcuate in front of the periphery; inner lip erased, pillar strong with a single fold near the body; attenuated in front; canal short. Height of shell, 16; of last whorl, 10; diameter, 6 mm. Cat. No. 209174, U.S.N.M.

Range.—Station 4309, off Point Loma, California, in 78 fathoms, sand, U. S. Bureau of Fisheries.

BORSONELLA NICOLI, new species.

Plate 12, fig. 1.

Shell solid, white, covered with a pale straw-colored periostracum, of eight whorls exclusive of the (lost) nucleus, the suture distinct with a slightly swollen margin; axial sculpture of (on the penultimate whorl about nine) nodular ribs, peripheral on the spire, becoming obsolete on the last whorl, beginning in front of the fasciole and obscure beyond the periphery; spiral sculpture of fine striae, visible only in occasional spots, the fasciole somewhat constricted; beside this there are faint traces of vermicular sculpture visible under a glass, reminiscent of the sculpture in *B. barbarentsis*; aperture narrow, anal sulcus moderately deep, outer lip thin, arcuate, body and pillar smooth, the plait hidden behind the columella which is attenuate in front, canal short and wide. Height of shell, 22; of last whorl, 13; diameter, 8 mm. Cat. No. 198925, U.S.N.M.

Range.—Southwest of San Nicolas Island, California, in 158 fathoms. U. S. Bureau of Fisheries Steamer *Albatross*.

BORSONELLA RHODOPE, new species.

Plate 12, fig. 3.

Shell with seven or more whorls exclusive of the (lost) nucleus, white covered with a pale olivaceous periostracum, suture distinct, not appressed; axial sculpture of rather strong irregular incremental lines; spiral sculpture of a thickened band between the suture and the somewhat constricted anal fasciole; at the shoulder a blunt angulation, in front of which are two obscure threads followed by a more distinct thread on which the suture is laid; on the last whorl in front of the angulation are about 18 threads growing smaller and more close-set anteriorly; there is no siphonal fasciole; aperture rather narrow, anal sulcus shallow rounded, outer lip thin, arcuate, sharp; inner lip erased, pillar straight, obliquely attenuated in front; canal rather wide, not recurved. Height of shell, 19; of last whorl, 11; diameter, 7 mm. Cat. No. 212361, U.S.N.M.

Range.—Station 2953, off Santa Rosa Island, California, in 82 fathoms, gray sand and broken shell. U. S. Bureau of Fisheries.

Genus LORA Gistel.

Since the name *Bela* (Leach MS.) Gray, 1847, has been shown to be synonymous with *Mangelia* Risso, having the same type, the question arises what name shall be adopted in its place? The name *Pleurotomina* was proposed by Gray in 1838¹ as a group name,

¹ Ann. Nat. Hist., vol. 1, p. 28, 1838.

apparently of subfamily value, including various Pleurotomids, among them *Drillia* Gray. Nine years later in some catalogues of local faunas¹ this name was used in a generic sense by Beck for an undescribed species said (p. 115) only to be "nahe turric. Mont." Earlier in the same work the name is cited as of Gray, as if it covered all small Pleurotomids. Not until 1869 was Beck's species described by Mörch² under the name of "*Pleurotoma (Ischnula) impressa* Beck," from Bell Sound, Spitsbergen. As neither genus nor species was described in 1847, the opinion prevails that *Pleurotomina* can not be adopted. The next name is *Lora* Gistel³ proposed with the sole species *Defrancia viridula* O. Fabricius, which must be taken as type. This species, as Fabricius's description indicates, is a *Bela*; the type-specimen at Copenhagen confirms this opinion. How it has come to be regarded as an *Admete* is not easy to understand.

Subsequently Mörch⁴ proposed for part of the Belas of authors the name *Oenopota*, rendered *Onopota* by H. and A. Adams. Under the circumstances *Lora* seems entitled to adoption.

LORA PITYSA, new species.

Plate 16, fig. 7.

Shell small, translucent white, with a one sided subglobular smooth nucleus of a whorl and a half, and about four subsequent whorls; suture distinct, anal fasciole sloping to a corded shoulder; spiral sculpture begins by two strong cords, one of which marks the shoulder and to these are added by intercalation until the penultimate whorl has four and the last whorl fourteen, not counting the threads on the canal; these are reticulated by axial cords of similar size which do not form ribs or nodes though the posterior cord at the shoulder is slightly undulated; anal sulcus obscure, aperture simple, inner lip erased, canal short. Height of shell, 5.5; of last whorl, 3.5; diameter, 2 mm. Cat. No. 209851, U.S.N.M.

Range.—From Point Pinos to San Diego, California, in 62 to 680 fathoms. U. S. Bureau of Fisheries steamer *Albatross*.

? LORA HALITROPA, new species.

Plate 16, fig. 6.

Shell small, white, with a subglobular smooth nucleus of a whorl and a half, followed by four and a half subsequent whorls; suture appressed, undulated by the ends of the ribs, anal fasciole obscure; axial sculpture of (on the last whorl 14) stout rounded ribs which extend to the suture which they undulate, and, with some loss of

¹ Amtl. Ber. Deutsche Naturf. u. Aertze, Kiel, 1847.

² Mém. Soc. Mal. de Belgique, vol. 4, p. 21, 1869.

³ Naturg. Thierr., p. IX, 1848.

⁴ Yoldi Catalogue, vol. 1, p. 78, 1852, no type cited or description given. *Pleurotoma pleurotomaria* first species, which I now select as type.

emphasis, to the canal; the interspaces are equal or narrower; spiral sculpture begins at the shoulder and consists of very minute equal, regular close-set flattish threads which are less conspicuous on the ribs and, in the interspaces, are segmented by the incremental lines; aperture simple, inner lip erased, canal short, proximately constricted, marking a perceptible siphonal fasciole. Height of shell, 6; of last whorl, 4; diameter, 2.6 mm. Cat. No. 96216, U.S.N.M.

Range.—Magellan Strait, in 61 fathoms, sand bottom temperature 48° F.

There is a possibility that this shell may belong to another genus, but in the absence of the operculum and soft parts, this can not be decided.

LORA BRACHIS, new species.

Plate 7, fig. 3.

Shell small, short, stout, blunt, of about four and a half whorls; anal fasciole sloping toward a carinate beaded shoulder, retractively wrinkled between the distinct suture and a nearly median thread; axial sculpture of (on the last whorl about 30) small, narrow, protractive equal ribs with subequal interspaces, obsolete on the base, each beginning at a bead on the carina; spiral sculpture of fine sharp equal and equidistant striae covering the shell in front of the carina, cutting minutely the summits of the ribs, with wider flattish interspaces; aperture rather wide, simple; canal short, deep, recurved. Height of shell, 4.5; of last whorl, 3; diameter, 3.3 mm. Cat. No. 96486, U.S.N.M.

Range.—Galapagos Islands in 812 fathoms, ooze, bottom temperature 38.4° F. U. S. Bureau of Fisheries steamer *Albatross*.

LORA ANTIPODA, new species.

Plate 19, fig. 1.

Shell small, whitish, elevated, with a smooth bulbous nucleus and about five shouldered whorls; suture distinct, slightly appressed, anal fasciole wide, sloping, concavely wrinkled; shoulder marked by a stout smooth slightly undulated cord in front of which are three or four smaller threads and beyond those still smaller close-set threadlets extending to the end of the canal; axial sculpture of (on the penultimate whorl about 14) protractively arcuate ribs with subequal interspaces, feebler on the last whorl and obsolete on the base; canal straight, rather long, aperture simple; the spiral sculpture does not nodulate the axial ribs and is most distinct in the interspaces. Height of shell, 5; of last whorl, 3; diameter, 2.4 mm. Cat. No. 209450, U.S.N.M.

Range.—Magellan Strait, in 61 fathoms, mud, bottom temperature 53.9° F. U. S. Bureau of Fisheries steamer *Albatross*.

LORA HEALYI, new species.

Plate 16, fig. 8.

Shell white, more or less discolored by ferruginous red (probably adventitious) with five and a half rounded whorls, a subglobular smooth nucleus forming one and a half of these; spiral sculpture of (on the penultimate whorl 6 or 7, on the last whorl about 14) coarse rather irregular cords with narrower channelled interspaces, the cords more or less nodulated by incremental lines and on the spire by obscure ribbing; suture distinct, aperture narrow, simple; pillar white, erased, canal short, straight. Height of shell, 15; of last whorl, 10; diameter, 7 mm. Cat. No. 223908, U.S.N.M.

Range.—Arctic Ocean north of Bering Straits.

Named in honor of the late Capt. M. A. Healy, of the United States Revenue Marine, a frequent contributor to the national collection.

LORA POPOVIA, new species.

Plate 14, fig. 8.

Shell white with straw-colored periostracum, six shouldered whorls, a subglobular small nucleus, and distinct suture; spiral sculpture of (on the upper whorl four or five) rounded threads, between the shoulder and the succeeding suture, the threading obsolete on the last whorl or reduced to fine striation on the base and canal; axial sculpture on the spire of about 16 short rounded ribs swollen at the shoulder and reaching the succeeding suture, but fainter on the last whorl and absent from the base; aperture simple, pillar white, erased, canal short, straight. Height of shell 13; of last whorl, 8; diameter 5.5 mm. Cat. 220883, U.S.N.M.

Range.—Bristol Bay, Bering Sea, to Monterey Bay, California.

LORA TENUILIRATA Dall.

Plate 15, fig. 4.

Bela tenuilirata DALL, Amer. Journ. Conch., vol. 7, p. 98, Nov. 1871.

? + *Bela simplex* G. O. SARS, 1878, not of Middendorff, 1849.

The original specimen of this species was quite young. I now figure the adult.

Range.—Point Barrow, Arctic Ocean, to the Shumagin Islands, Alaska.

LORA TENUILIRATA CYMATA, new variety.

Plate 16, fig. 4.

Shell resembling typical *tenuilirata*, but with a higher and more acute spire, and with 20 or more narrow axial riblets on the last whorl, obsolete on the base, and a single spiral thread at the shoulder. Height, 23; of last whorl, 17; diameter, 10.5 mm. Cat. No. 226186, U.S.N.M.

Range.—Nunivak Island, Bering Sea, to the Shumagin Islands, Alaska.

LORA LAWRENCIANA, new name.

Plate 15, fig. 6.

Bela tenuilirata KRAUSE, Arch. f. Naturg, vol. 51, heft 3, p. 274, pl. 18, fig. 8, 1886; not of Dall, 1871.

Range.—Point Belcher, Arctic Ocean, to the Pribilof Islands, Bering Sea.

LORA MITRATA, new species.

Plate 16, fig. 1.

Shell resembling *tenuilirata cymata*, but with sharper sculpture, higher spire, shorter aperture, more gyrate pillar, and darker color, especially on the keel at the shoulder. Height of shell, 24; of last whorl, 16; diameter, 11 mm. Cat. No. 87857, U.S.N.M.

Range.—Port Clarence, Bering Strait, to the Shumagin Islands, Alaska.

LORA PAVLOVA, new species.

Plate 14, fig. 9.

Shell white, thin, and delicate, with six or more whorls, the nucleus eroded; spiral sculpture of fine striae with wider flat interspaces minutely cut into segments by close regular incremental lines, whorls subangulate at the shoulder; axial sculpture of sharp, sigmoid riblets (22 or more on the penultimate whorl) obsolete on the base and on most of the last whorl; anal sulcus wide, shallow; aperture simple, inner lip erased. Height of shell, 18.5; of last whorl, 12.5; diameter, 9 mm. Cat. No. 226200, U.S.N.M.

Range.—Station 3607, off the Pribilof Islands, Bering Sea, in 987 fathoms, mud, bottom temperature 35.9° F. U. S. Bureau of Fisheries steamer *Albatross*.

LORA CHIACHIANA, new species.

Plate 14, fig. 7.

Shell olive brown, with five whorls, the nucleus eroded, suture distinct; upper whorls with about 16 axial, rather rude, roughly sigmoid riblets crossing the whorls, obsolete on the latter half of the shell, the incremental lines irregular; spiral sculpture of almost obsolete fine spiral striae most evident on the last whorl, the interspaces flattish, wider, or subequal; aperture brownish, simple, pillar white, canal slightly recurved. Height of shell, 20; of last whorl, 14; diameter, 9 mm. Cat. No. 206207, U.S.N.M.

Range.—Chiachi Islands, Aleutian chain.

LORA ALITAKENSIS, new species.

Plate 15, fig. 7.

Shell thin, pale yellowish, with touches of reddish brown on the prominences, with about six whorls, the nucleus eroded, the suture

distinct; axial sculpture of (on the last whorl 14) sigmoid ribs which cross the whorls and reach the canal with subequal interspaces; spiral sculpture with narrow channeled grooves with wider flattish interspaces often divided by a central feebler groove, these cover the whole surface; aperture simple, inner lip erased, white; canal short, very slightly recurved. Height of shell, 20; of last whorl, 14; diameter, 9 mm. Cat. No. 222088, U.S.N.M.

Range.—Unimak Island, Aleutians, eastward to Alitak Bay, Kodiak.

LORA EQUATORIALIS, new species.

Plate 13, fig. 2.

Shell white, rather solid, with about six shouldered whorls, the apex eroded, the suture distinct, slightly constricted and appressed; axial sculpture of about 14 rounded ribs nearly reaching the canal, with subequal interspaces; incremental lines inconspicuous; spiral sculpture of uniform spiral grooves with wider flattish interspaces, cutting the tops of the ribs; aperture short, simple, inner lip callous, canal short, recurved. Height of shell, 13.5; of last whorl, 9; diameter, 6 mm. Cat. No. 97092, U.S.N.M.

Range.—Coast of Ecuador to Patagonia in 401 to 122 fathoms.

LORA PRIBILOVA, new species.

Plate 16, fig. 3.

Shell white with a strawcolored periostracum and about six roughly sculptured whorls, the apex eroded; suture distinct, axial sculpture of (on the last whorl 16) rounded narrow riblets crossing the whorls and obsolete on the base; spiral sculpture of (on the spire three, on the last whorl four) prominent rounded cords more or less nodose at the intersections with the ribs, and between the cords two or three fine threads and a few finer striae; the posterior cord forms a shoulder to the whorl; on the canal the cords and threads become more uniform; aperture simple, pillar erased. Height of shell, 12; of last whorl, 8; diameter, 5.5 mm. Cat. No. 225573, U.S.N.M.

Range.—Cape Lisburne, Arctic Ocean, south to Esteros Bay, California.

LORA INEQUITA, new species.

Plate 16, fig. 9.

Shell yellowish white, thin, of about six moderately rounded whorls, the nucleus eroded; suture distinct; spiral sculpture on the early whorls of two strong cords one on each side of the periphery, between which are first one, later two, and finally four smaller threads; the posterior cord gives the whorl a slight shoulder; on the last whorl in front of the anterior cord to the end of the canal are smaller, more or less alternate flattish cords close-set, the inter-

spaces wider on the canal; axial sculpture of (on the penultimate whorl about 20) rounded sigmoid ribs with wider or subequal interspaces, crossing the early whorls, becoming less evident on the later whorls, and obsolete on the base of the last whorl; the incremental lines are more or less evident; aperture narrow, simple; pillar white, erased, attenuated in front. Height of shell, 11; of last whorl, 7; diameter, 4 mm. Cat. No. 222238, U.S.N.M.

Range.—Plover Bay, Bering Sea, south to Boca de Quadra, Alaska.

LORA SURANA, new species.

Plate 14, fig. 6.

Shell thin, white, small, with about six whorls, the nucleus defective, the suture distinct; anal fasciole extending from the suture to a cord which forms a shoulder to the whorl, retractively loop-wrinkled; axial sculpture in front of the shoulder of numerous low narrow sigmoid riblets with subequal interspaces, obsolete on the base, on the spire crossing the whorls; spiral sculpture of somewhat unequal flattish threads with equal or wider interspaces, crossing the shell, not nodulous at the intersections; aperture simple, canal short, twisted, developing an evident siphonal fasciole; operculum normal. Height of shell, 9; of last whorl, 6; diameter, 4 mm. Cat. No. 206590, U.S.N.M.

Range.—From off Point Sur to off Point Pinos, California, in 292 to 398 fathoms, mud, bottom temperature 41° F.

LORA TABULATA Carpenter.

Plate 14, fig. 1.

Mangelia ? tabulata CARPENTER, Ann. Mag. Nat. Hist., ser. 3, vol. 15, p. 29, Jan., 1865.

Range.—Sitka, Alaska, to Monterey, California.

In fully adult specimens there is sometimes a thickening near the anterior end of the pillar which in some individuals approaches a fold, but is not carried into the interior on the pillar.

LORA NAZANENSIS, new species.

Plate 15, fig. 8.

Shell short-fusiform, white with a brown band in front of the suture and another on the base, or all white, with about five whorls and a very small blunt nucleus, suture distinct, whorls moderately rounded; axial sculpture of (on the penultimate whorl about 25) narrow crowded sigmoid ribs not passing the periphery but extending from the preceding suture with narrower interspaces; spiral sculpture of narrow grooves with wider interspaces, more close toward the base and on the spire cutting the summits of the ribs; aperture simple, pillar white, erased; canal short, straight. Height of

shell, 11; of last whorl, 8; diameter, 5.5 mm. Cat. No. 220327, U.S.N.M.

Range.—Nazan Bay, Atka Island, Aleutian Islands, in about 12 fathoms; a few worn specimens from Norton Sound may belong here.

LORA EXCURVATA Carpenter.

Plate 14, fig. 5.

Bela excurvata CARPENTER, Proc. Acad. Nat. Sci., Phila., for 1865, p. 63.

Range.—Bristol Bay, Bering Sea, to Puget Sound.

LORA KRAUSEI Dall.

Plate 15, fig. 3.

Bela krausei DALL, Proc. U. S. Nat. Mus., vol. 9, 1886, p. 301, pl. 4, fig. 4.

Range.—Port Etches, Alaska, in 15 fathoms, sand.

LORA MONTEREALIS, new species.

Plate 15, fig. 9.

Shell very similar to *L. surana*, but larger, with the same number of whorls, the ribs less numerous, more emphatic, with wider interspaces, and a less conspicuous cord at the shoulder. Height of shell, 12; of last whorl, 8; diameter, 5.3 mm. Cat. No. 226160, U.S.N.M.

Range.—Monterey Bay, in 581 fathoms, mud, bottom temperature 37.8° F. U. S. Bureau of Fisheries steamer *Albatross*.

LORA QUADRA, new species.

Plate 15, fig. 2.

Shell short and stout, white with about five whorls, the apex eroded, suture distinct, the anal fasciole narrow, excavated, finely spirally striated; axial sculpture of (on the last whorl about 18) stout nearly vertical ribs angulated at the edge of the fasciole, forming a narrow shoulder, but without a limiting cord, with usually narrower interspaces and obsolete on the base, the incremental lines not conspicuous; spiral sculpture of spiral grooves with much wider flat interspaces, the canal constricted, spirally threaded, very short; aperture simple, inner lip erased. Height of shell, 8; of last whorl, 6; diameter, 4.5 mm. Cat. No. 223606a, U.S.N.M.

Range.—Aleutian Islands to Puget Sound.

LORA DIEGENSIS, new species.

Plate 16, fig. 10.

Shell white with a pale brownish periostracum and five shouldered whorls, the nucleus eroded; suture distinct, anal fasciole narrow, spirally threaded, bounded in front by the angle of the shoulder; spiral sculpture of on the spire three to five subequal cords with equal interspaces, on the last whorl about 14 slightly swollen at the intersections; axial sculpture of (on the penultimate whorl about 24)

cord like riblets, beaded at the shoulder, obsolete on the base, the rectangular interstices marked; aperture simple, pillar erased, attenuated in front, canal well marked, straight. Height of shell, 8.5; of last whorl, 6; diameter, 4 mm. Cat. No. 209421 *a*, U.S.N.M.

Range.—Off San Diego, California, and south to Cape San Quentin, Lower California, in 112 to 822 fathoms.

LORA LOTTA, new species.

Plate 14, fig. 4.

Shell small, white, with a pale straw-colored periostracum, nucleus eroded, four whorls remaining, the general characters resembling those of *L. surana*, but the axial sculpture nearly obsolete, or quite absent from the last whorl, the shoulder less accented, and the canal straighter. Height of shell, 7.5; of last whorl, 6; diameter, 4 mm. Cat. No. 210725, U.S.N.M.

Range.—Queen Charlotte Islands, British Columbia, in 876 fathoms, mud, bottom temperature 36.5° F.

LORA KYSKANA, new species.

Plate 14, fig. 3.

Shell belonging to the group of *L. fidicula* Gould, but with looser and less regular sculpture, white, the nucleus defective, with about six shouldered whorls; suture distinct, anal fasciole obscure, undulated by the ends of the ribs, spirally striated; axial sculpture of (on the last whorl 14 or 15) rounded ribs with wider interspaces, prominent at the shoulder, crossing the whorls at the spire, obsolete on the base; spiral sculpture of numerous narrow channeled grooves with wider flattish interspaces, not nodulating the summits of the ribs; on the spire the interspaces are more cordlike, six or seven between the shoulder and the succeeding suture; aperture simple, inner lip erased, canal short, straight. Height of shell, 10.5; of last whorl, 7; diameter, 4.5 mm. Cat. No. 224286, U.S.N.M.

Range.—Aleutian Islands to Puget Sound.

LORA MIONA, new species.

Plate 14, fig. 2.

This is another species of the *fidicula* group, white, small, roundly shouldered with rather coarse sculpture on the spire, which becomes obsolete on the last whorl; axial sculpture of (on the penultimate whorl 13) rounded irregular ribs with subequal interspaces, the ribs nodulate by the intersection of three or four rather strong spiral cords with narrower interspaces; on the last whorl the ribs are obsolete and the spiral sculpture feebler, flatter, and with occasional intercalary smaller threads; anal fasciole and sulcus obscure, aperture narrow, inner lip erased, canal short. Height of shell, 8; of last whorl, 5; diameter, 3.5 mm. Cat. No. 252208, U.S.N.M.

Range.—Sitka, Alaska, to Puget Sound.

LORA HARPA Dall.

Mangilia (Bela) plicifera F. SCHMIDT, Mammut Exp., Mém. Imp. Acad. St. Petersburg, ser. 7, vol. 18, No. 1, pp. 57, 168, pl. 4, figs. 4, 5, 1872. Not of S. Wood, Crag Moll., p. 64, pl. 7, fig. 15, 1848 (as *Clavatula*).

Bela harpa DALL, Proc. U. S. Nat. Mus., vol. 7, 1884, p. 523; vol. 9, 1886, p. 300, pl. 4, fig. 12.

Bela schmidti FRIELE, North Atlantic Exp., p. 10, pl. 8, fig. 6, 1886.

Bela turpa "Dall." FRIELE, North Atlantic Exp., p. 10, in footnote, err. typ. for *harpa*.

Range.—Arctic Ocean near Point Barrow and south to Queen Charlotte Sound, British Columbia. Quaternary of Novaia Zemlia (Schmidt). Spitsbergen (Friele). Kara Sea (Leche).

LORA REGULUS, new species.

Plate 15, fig. 1.

Shell small, white, slender, with predominant spiral sculpture, five whorls, the nucleus eroded; anal fasciole constricted, narrow, the suture inconspicuous, appressed; axial sculpture occasional faint traces of threadlike obsolete ribs; spiral sculpture of (on the penultimate whorl four or five, on the last whorl about nine) flattish, somewhat undulated spirals with irregular interspaces, usually wider on the last whorl, and on the canal finer close spiral threads; aperture narrow, inner lip erased, canal short, slightly recurved. Height of shell, 8; of last whorl, 5; diameter, 3 mm. Cat. No. 207262, U.S.N.M.

Range.—Off Point Reyes, California, in 61 fathoms, rocky bottom, temperature 48.5° F.

LORA IMPRESSA Mörch.

"*Pleurotomina* n. sp. nahe turric. Mont." BECK, Amtl. Ber. Deutscher Naturf. u. Aerzte, Kiel, 1847, p. 115.

Pleurotoma (Ischnula) impressa (Beck MS.) MÖRCH, Mém. Soc. Malac. de Belgique, vol. 4, p. 21, 1869.

Bela impressa LECHE, Nov. Zembl. Moll., p. 54, pl. 1, fig. 16.—KRAUSE, Arch. f. Naturg., vol. 51, heft 3, p. 278, 1886.

Range.—Arctic Ocean, near the Seahorse Islands, south to the Aleutians and eastward to St. Paul, Kodiak Island, Alaska. On the Atlantic side, Bell Sound, Spitsbergen, and Novaia Zemlia.

LORA LÜTKENI, new species.

Plate 16, fig. 5.

Shell small, white, with a minute smooth nucleus and five subsequent whorls; suture distinct, anal fasciole narrow, constricted, obscure; axial sculpture of (on the last whorl 26) narrow well-defined ribs, slightly peripherally prominent on the early whorls, with narrower interspaces, extending from suture to suture and on the last whorl to the canal, slightly protractively arcuate; there are also fine regular incremental lines; spiral sculpture of numerous fine sharp striae with subequal interspaces, which groove the surfaces of the

ribs and become threadlike on the canal; aperture narrow, inner lip erased, canal short. Height of shell, 8; of last whorl, 5; diameter, 3 mm. Cat. No. 220305, U.S.N.M.

Range.—Port Etches, Alaska, in 10 fathoms, mud; W. H. Dall.

Named in honor of the late Professor Lütken, of Copenhagen. It is a small member of the *L. harpa* group.

LORA SIXTA, new species.

Plate 16, fig. 12.

Shell small, white with a pale olivaceous periostracum, of five or more whorls (apex eroded); suture distinct; anal fasciole slightly excavated, sloping to a shoulder; axial sculpture of (on the last whorl about 20) narrow rounded ribs with subequal interspaces, obsolete on the base, slightly nodulose on the shoulder, supplemented by fine regular almost microscopic incremental lines; spiral sculpture hardly visible on the ribs, of feeble threads with wider flat interspaces, most evident toward the canal; aperture simple, inner lip erased, canal straight. Height of shell, 8; of last whorl, 6; diameter, 3.5 mm. Cat. No. 209235, U.S.N.M.

Range.—Off San Diego, California, in 640 fathoms, mud, bottom temperature 39° F. U. S. Bureau of Fisheries steamer *Albatross*.

LORA ALTHORPENSIS, new species.

Plate 16, fig. 11.

Shell waxen yellow, coarsely sculptured, small, of about six whorls, including one smooth nuclear turn; suture distinct, anal fasciole obscure, anal sulcus very feeble; spiral sculpture on the early whorls of two strong rows of nodules on the ribs, the cords connecting them less conspicuous; on the last whorl there are about 14 cords, but only that at the shoulder is conspicuous, the interspaces are narrower with an occasional intercalary thread; axial sculpture of (on the penultimate whorl about 20) narrow nearly vertical ribs with subequal interspaces reticulating the spirals, with deep interstices, but on the last whorl becoming obsolete; aperture narrow, inner lip erased, canal short, straight. Height of shell, 6.5; of last whorl, 4; diameter, 2.5 mm. Cat. No. 208558, U.S.N.M.

Range.—Port Althorp, Alaska, in Granite Cove, in about 12 fathoms, sand; W. H. Dall.

This species belongs to the group of *L. kyskana*, but is a much smaller shell.

LORA TENUISSIMA, new species.

Plate 15, fig. 5.

Shell thin, fragile, acute, whitish, with about six whorls, the nuclear whorl eroded; suture distinct, whorls evenly rounded; spiral sculpture of fine even equal close-set minute threads covering the whole

surface; axial sculpture of almost microscopic, even, regular incremental lines, and on the third whorl about 16 small sharp ribs crossing the whorl, with wider interspaces and becoming obsolete on the fourth whorl; anal sulcus shallow, aperture simple, inner lip erased, pillar attenuated in front, canal short, straight. Height of shell, 15; of last whorl, 11; diameter, 6 mm. Cat. No. 214207, U.S.N.M.

Range.—Chernoffski Harbor, Unalaska Island, Alaska, in 109 fathoms.

This species is remarkably distinct from most of the others described in this paper. Only one specimen was obtained. The operculum is shorter and broader than in most of the *Loras*.

LORA RUGULATA Troscchel.

Plate 13, fig. 6.

Bela rugulata (Möller MS.) Troschel, Geb. der Schnecken, 1866, vol. 2, p. 44, pl. 4, fig. 6.—G. O. Sars, Moll. reg. Arct. Norv., p. 230, pl. 23, fig. 6, 1878.—Friele, North Atlantic Exp., vol. 2, p. 3, pl. 7, figs. 1-7; pl. 9, figs. 1-12, 1886.

Range.—Bering Sea, from Plover Bay to the Aleutians and Kamchatka and south to Port Althorp, Alaska, in 16 to 69 fathoms, North Atlantic, Spitsbergen, Northern Norway, with several varieties. Friele unites with it *L. assimilis* G. O. Sars, and *L. gouldii* Verrill. The figured specimen is Cat. No. 222298, U.S.N.M.

LORA COLPOICA, new species.

Plate 16, fig. 2.

Shell resembling *L. tenuissima* in sculpture, but shorter, much more distinctly shouldered, and subangulate at the shoulder, with traces of axial sculpture carried on to the last whorl, but no distinct ribs on the early whorls as in that species. Height of shell, 11; of last whorl, 8.3; diameter, 6 mm. Cat. No. 214193, U.S.N.M.

Range.—Tillamook Bay, Oregon, in 786 fathoms, U. S. Bureau of Fisheries Steamer *Albatross*.

Subfamily MANGILIINAE.

PLEUROTOMELLA HERMINEA, new species.

Plate 3, fig. 6.

Shell of moderate size, gray with brown apex; nucleus eroded; with a total of eight whorls; suture distinct, preceded by an obscure thickened margin, not appressed; whorls descending flatly from the suture to the shoulder; axial sculpture of (on the last whorl 10 or 11) short, protractively oblique rounded ribs, extending on the spire from the shoulder to the succeeding suture, but on the last whorl not over the base; and obscure incremental lines arcuate on the anal fasciole; spiral sculpture on the spire of three or more threads, with

subequal interspaces, in the space between the periphery and the succeeding suture, and on the last whorl on the base about twenty flatter spirals with narrower interspaces; most of the threads are swollen where they pass over the ribs; aperture wide and short; anal fasciole deep and rounded, not quite adjacent to the suture; outer lip thin, produced, sharp; body erased; pillar short, gyrate, but the axis not pervious; canal distinct, short slightly recurved. Height of shell, 19; of last whorl, 12; diameter, 8 mm. Cat. No. 210544, U.S.N.M.

Range.—Station 4407, off Catalina Island, California, in 600 fathoms, ooze, U. S. Bureau of Fisheries.

PLEUROTOMELLA THALASSICA, new species.

Plate 3, fig. 4.

Shell small, snow white, with five or more whorls exclusive of the (lost) nucleus; suture distinct, appressed, the fasciole in front of it constricted, giving the whorls a conspicuous shoulder; spiral sculpture of a few obsolete threads on the base, not extending to the canal and with wider interspaces; axial sculpture of (on the penultimate whorl 16) strong obliquely protractive ribs, most prominent at the shoulder where they begin, disappearing on the base and obsolete on the last whorl; the incremental lines are inconspicuous; aperture rather wide, anal sulcus close to the suture, rounded, rather wide but not deep; outer lip thin, much produced; inner lip erased, pillar short, canal short, deep, distinct, recurved, with a distinct siphonal fasciole. Height of shell, 10; of last whorl, 5.5; diameter, 5 mm. Cat. No. 214206, U.S.N.M.

Range.—Station 3346, off Tillamook Bay, Oregon, in 786 fathoms, mud, bottom temperature 37.3° F. U. S. Bureau of Fisheries.

PLEUROTOMELLA OCEANIDA, new species.

Plate 3, fig. 5.

Shell small, thin, pure white, with five well-rounded whorls without the (lost) nucleus; suture distinct, anal fasciole wide, arcuately wrinkled; axial sculpture of (on the last whorl about 30) narrow thread-like ribs extending from the fasciole to the base with wider interspaces; also very fine close incremental lines; spiral sculpture of (on the penultimate whorl five or six) similar threads slightly nodulous where they intersect the ribs, with wider interspaces in each of which is a smaller intercalary thread; this sculpture extends to the base on the last whorl, the interspaces on the canal have no intercalary thread; aperture rather wide, anal sulcus rounded, deep, outer lip thin, produced, inner lip and pillar erased, the columella gyrate, attenuated in front, the axis pervious, the canal a little recurved. Height of shell, 12; of last whorl, 8.5; diameter 6.7 mm. Cat. No. 123117, U.S.N.M.

Range.—Station 3392, Gulf of Panama, U. S. Bureau of Fisheries steamer *Albatross* in 1,270 fathoms, bottom temperature 36.4° F.

GLYPHOSTOMA THALASSOMA Dall.

Plate 17, fig. 2.

Glyphostoma thalassoma DALL, Bull. Mus. Comp. Zoöl., vol. 43, No. 6, p. 290, Oct. 1908.

Range.—Station 3017, Gulf of California, off Cape Lobos, in 58 fathoms, mud, bottom temperature 61.8° F. Cat. No. 110612, U.S.N.M. The specimen selected for figuring is from 76 fathoms Cat. No. 223154, U.S.N.M.

GLYPHOSTOMA ADANA, new species.

Plate 17, fig. 1.

Shell small, slender, acute, whitish with the aperture more or less tinged with brown; nucleus white, glassy, with a minute globular apex and four subsequent whorls changing abruptly into the sculpture of the six subsequent whorls; the first of the latter has a peripheral keel changing on the next whorl to two and on the later whorls to three equidistant prominent cords with a smaller one behind and another in front of and close to the suture; on the last whorl the latter is obsolete and on the base there are 9 or 10 cords with interspaces widening toward the periphery, of which cords the more prominent are minutely nodulous or swollen when they cross the axial riblets; there is a wide concave anal fasciole in front of the suture with arcuate striation; the whorl at the suture somewhat appressed; axial sculpture is composed of about a dozen rather feeble ribs extending from the anal fasciole forward to the suture, but which are nearly obsolete on the second half of the last whorl; aperture rather narrow, the outer lip varicose, minutely denticulate within and with a sharp edge, the anal sulcus deep and rounded with a nodular callus on the body; inner lip with six or more denticulations; canal short, deep, and strongly recurved. Height of shell, 10; of last whorl, 5; diameter, 3.7 mm. Cat. No. 267597, U.S.N.M.

Range.—Head of Concepcion Bay, Lower California, Dr. Paul Bartsch.

This species resembles *G. adria*, but is lighter colored, smaller, and proportionately more slender.

GLYPHOSTOMA ADRIA, new species.

Plate 17, fig. 5.

Shell small, slender, acute, pale brownish, or with still paler nebulosity; with three darker brown nuclear whorls, the first minute, the others regularly increasing with a deep suture; subsequent whorls seven, the first peripherally keeled, the periphery rather anterior;

subsequent whorls with a broad spirally striated anal fasciole followed by two or three spiral cords strongest where they cross the ribs and feebler in the interspaces; on the last whorl the cords are less prominent, with about equal spirally striated interspaces, and the cords continue becoming more close-set toward and upon the canal to the number of 15 or more; axial sculpture of (on the last whorl 10, excluding the terminal varix) protractively oblique ribs extending from in front of the anal fasciole stronger on the periphery and obsolete on the base of the whorl; terminal varix strong, the margin incurved smooth; the anal fasciole large, rounded; the lips callous with minute denticulations; the canal short, deep, recurved, the aperture rather narrow. Height of shell, 10; of last whorl, 6; diameter, 4 mm. Cat. No. 269030, U.S.N.M.

Range.—Dredged at Santa Maria Bay, Lower California, Dr. Paul Bartsch.

GLYPHOSTOMA PARTEFILOSA, new species.

Plate 17, fig. 4.

Shell small, white, with pale brown spiral banding; nucleus small, smooth, glassy, followed by six sculptured whorls; suture distinct, the whorl with a shoulder immediately in front of it; spiral sculpture only of about 13 threads, covering the canal when it is not worn; axial sculpture of (on the last whorl 12) narrow, slightly oblique ribs, arcuate at the shoulder, not continuous over the spire and with wider interspaces; aperture narrow with a flaring anal sulcus and no subsutural callus; pillar short, denticulate, outer lip thickened, dentate within, canal short, recurved. Height of shell, 11; of last whorl, 6; diameter, 4.5 mm. Cat. No. 224413, U.S.N.M.

Range.—Off Cape Tepoca, Gulf of California, in 36 fathoms, sand.

GLYPHOSTOMA SIRENA, new species.

Plate 17, fig. 3.

Shell elongated slender, acute, waxen white clouded with light brown, nucleus pointed, the first whorl minute, the next two enlarging, all smooth; subsequent whorls seven, at first with a peripheral keel, later strongly ribbed and coarsely reticulated; spiral sculpture of a thread in front of the appressed and undulated suture, then, on successive turns of the spire, two, three and four coarse cords, with subequal interspaces between the fasciole and the suture, prominent only when they cross the ribs and feeble in the interspaces; on the last whorl there are nine of these and a few smaller threads on the canal; the anal fasciole is smooth narrow and close to the suture, undulated by the ends of the ribs; axial sculpture of (on the last

whorl nine) strong rounded ribs, feeble on the fasciole and reaching to the canal; aperture narrow, anal sulcus deep with a small sub-sutural callus; outer lip arcuate, prominently varicose, the edge in-folded; inner lip and pillar smooth (possibly not quite adult); canal short, distinct, slightly recurved. Height of shell, 10; of last whorl, 5; diameter, 4 mm. Cat. No. 195004, U.S.N.M.

Range.—Station 2813, in the Galapagos Islands, in 40 fathoms, coral sand, surface temperature 81° F. U. S. Bureau of Fisheries.

This species is small for the genus and perhaps has not quite completed the callosities around the aperture.

GLYPHOSTOMA CYMODOCE, new species.

Plate 17, fig. 6.

Shell small, flesh colored, slender, acute, with a smooth small purple-brown nucleus of about two whorls and about six subsequent whorls; suture appressed with a slightly constricted fasciole immediately in front of it sculptured by half a dozen fine sharp close-set equal spiral threads; other spiral sculpture of (on the spire two to four) flattish spiral major cords with equal or wider interspaces in which runs an intercalary smaller thread; on the last whorl this sculpture is continuous over the shell from the shoulder to the base, but the intercalary threads gradually enlarge until they are practically equal to the originally larger cords; the small siphonal fasciole has a few finer and closer threads; axial sculpture of (on the penultimate whorl about eleven) rounded vertical ribs extending from the shoulder to the succeeding suture, but obsolete on the last whorl and not nodulose where they are intersected by the cords; the incremental lines are only conspicuous on the anal fasciole, where they are slightly puckered in front of the suture; aperture subovate, anal sulcus deep, rounded, close to the suture with a subsutural callus; outer lip thickened, slightly crenulate by the external sculpture, smooth within, arcuately produced, with a prominent varix behind it; inner lip erased, pillar short, canal short, distinct, slightly recurved. Height of shell, 11.5; of last whorl, 6; diameter, 4 mm. Cat. No. 150569, U.S.N.M.

Range.—Santa Barbara, California; Woodworth.

PHILBERTIA HESIONE, new species.

Shell small, whitish, biconic, acute, with a smooth bulbous nucleus of a whorl and a half and four and a half subsequent sculptured whorls; suture distinct, not appressed, the anal fasciole close to it, flattish, at first with fine spiral sculpture but on the last whorl it becomes nearly smooth: other spiral sculpture of a narrow prominent thread at the periphery which is doubled on the subsequent turns, on the last whorl there are eleven of the threads which are somewhat

nodulose where they override the ribs, with much wider interspaces, and a few close threads on the canal; axial sculpture of about 13 somewhat oblique narrow ribs, extending from the suture to the shoulder on the spire, and on the last whorl obsolete on the base; they are separated by wider interspaces and the incremental lines are feeble; aperture narrow, the anal sulcus narrow, deep, rounded, close to the suture, with a conspicuous subsutural callus; outer lip thin with a moderate varix behind it, and no internal lirae; inner lip erased, pillar short; canal short, deep distinct, slightly constricted and recurved; there is a small nodule at the inner anterior end of the outer lip where the canal begins. Height of shell, 9.5; of last whorl, 6; diameter, 4 mm. Cat. No. 211333, U.S.N.M.

Range.—Station 2902, off Santa Rosa Island, California, in 53 fathoms, sandy mud, bottom temperature 49° F. U. S. Bureau of Fisheries.

PHILBERTIA HELENA, new species.

Plate 18, fig. 2.

Shell minute, solid, pale yellowish brown, strongly sculptured; nucleus low, rapidly increasing, of about two whorls, the last one keeled, otherwise smooth; subsequent whorls four with a deeply constricted, not appressed suture; axial sculpture of (on the last whorl seven) strong ribs angulated at the periphery, with subequal deep interspaces, and which are not continuous up the spire; spiral sculpture of on the upper whorl one, on the third two, on the last whorl about seven obscure rounded rather coarse threads with narrower interspaces; aperture narrow; anal sulcus shallow close to the suture; outer lip varicose, smooth within, inner lip smooth, pillar short, straight, canal not differentiated from the aperture. Height of shell, 3.5; of last whorl, 1.5; diameter, 1.25 mm. Cat. No. 268910, U.S.N.M.

Range.—Agua Verde Bay, Gulf of California. Dr. Paul Bartsch.

PHILBERTIA DORIS, new species.

Plate 18, fig. 4.

Shell minute, yellowish white, acute, slender, with a small, elevated nucleus of three whorls, its apex minute, smooth, the last whorl microscopically axially ribbed; subsequent whorls reticulate, well rounded, with a distinct not appressed suture; spiral sculpture on the spire of strong cords, not nodulate at the intersections, three at the first, four or five on the next two, and about a dozen on the last whorl, equal with equal interspaces and separated from the preceding suture by a finely striated anal fasciole; axial sculpture of (on the last whorl 13) slender, equal, rounded ribs extending from the suture to the canal, with wider interspaces, not continuous up the spire and nearly parallel with the axis; aperture ovate, anal sulcus conspicuous, rounded, close to the suture; outer lip varicose, sharp edged, smooth

within; inner lip erased; canal short but distinct. Height of shell, 5.2; of last whorl, 3.25; diameter, 2.5 mm. Cat. No. 268703a, U.S.N.M.

Range.—Dredged in Agua Verde Bay, Gulf of California. Dr. Paul Bartsch.

? *PHILBERTIA DIONE*, new species.

Shell minute, whitish or yellowish with whiter mottling, subcylindric, coarsely sculptured, with about six whorls exclusive of the (lost) nucleus; suture obscure, constricted, somewhat appressed; spiral sculpture of (on the earlier whorls two, on the later ones three) strong equal cords, slightly swollen at the intersections and with somewhat narrower interspaces, the suture is laid on a fourth cord which is usually invisible; on the last whorl there are eight of these cords, the last one nodulous; there are three or four smaller threads on the canal; axial sculpture of coarse incremental lines and (on the last whorl 9 or 10) rounded ribs extending from the suture to the base, continuous up the spire which they half encircle; aperture narrow, anal sulcus shallow and wide, outer lip slightly thickened with a few lirae inside; inner lip smooth, canal narrow, very short. Height of (decollate) shell, 5; of last whorl, 2.8; diameter, 2 mm. Cat. No. 268703, U.S.N.M.

Range.—With the preceding species.

PHILBERTIA EPHAEDRA, new species.

Shell small, slender, acute, very pale brown or whitish, the nucleus with its apical whorl minute, transparent, smooth, bubble-like, followed by one and a half faintly reticulate whorls; subsequent whorls five and a half with a deep appressed suture; spiral sculpture of alternate threads with narrower interspaces, the major threads (on the spire two or three) rather prominent, especially the posterior one, which forms a sort of shoulder to the whorl, more conspicuous in the earlier whorls; the minor threads usually number one on the spire, but on the last whorl sometimes two or even three in the interspaces between the major threads; the threads are little or not at all swollen where they cross the ribs but are rendered harsh by the intersection of fine sharp close-set incremental lines; other axial sculpture of (on the last whorl seven) prominent rounded ribs, crossing the whole whorl, with subequal interspaces, and practically continuous vertically up the spire; there is no obvious anal fasciole; aperture narrow, the anal sulcus shallow, rounded, with no subsutural callus; outer lip subvaricose, moderately infolded, with a sharp edge, smooth inside; inner lip erased; canal short, wide, hardly recurved. Height of shell, 8.3; of last whorl, 5; diameter, 3.2 mm. Cat. No. 274107, U.S.N.M.

Range.—In beach drift at Panama; James Zetek.

PHILBERTIA AETHRA, new species.

Plate 18, fig. 6.

Shell small, acute, pale brownish, with a smooth acute nucleus of two whorls and six subsequent whorls, the first of which has two peripheral spiral threads with an angle at the shoulder; other spiral sculpture of somewhat alternated small uniform close-set threads, made minutely scabrous by the intersection of sharp incremental lines and covering the whole surface; axial sculpture otherwise of six prominent sharp vertical ribs with much wider interspaces, practically continuous up the spire and extending from the suture to the canal; aperture narrow, anal sulcus shallow, rounded, not preceded by any obvious fasciole, close to the suture; outer lip with a thickened varix behind it, sharp edged without internal lirae; inner lip slightly erased; canal narrow short, distinct. Height of shell, 8; of last whorl, 4.5; diameter, 3.3 mm. Cat. No. 211382, U.S.N.M.

Range.—Station 2823, off La Paz, Lower California, in 26½ fathoms broken shelly bottom. U. S. Bureau of Fisheries.

PHILBERTIA DICTYNNA, new species.

Plate 18, fig. 3.

Shell small, translucent white, with one and a half small smooth nuclear and four subsequent well-rounded whorls; suture distinct, not appressed; spiral sculpture of (on the last whorl about 10) subequal and equally spaced strong rounded threads, nodulous on the periphery where they intersect the ribs and feebler on the canal; axial sculpture of (on the last whorl about 10) short rounded ribs prominent only near the periphery and with wider interspaces; aperture elongate-ovate, anal sulcus wide and very shallow, outer lip thin, smooth inside, moderately produced; inner lip erased, pillar short, canal very short, slightly recurved. Height of shell, 3.8; of last whorl, 2.7; diameter, 2 mm. Cat. No. 4085, U.S.N.M.

Range.—Cape San Lucas, Lower California; J. Xantus.

PHILBERTIA SCAMMONI, new species.

Plate 18, fig. 1.

Shell small, whitish, with brown interspaces or bands, more or less variable; nucleus small, blunt, turbinate, the first whorl smooth, the third obliquely minutely axially ribbed; subsequent whorls five, with a rather deep suture the whorls rounded, uniformly sculptured; spiral sculpture of two kinds, on the spire two major threads near the periphery and four on the last whorl, whiter than the rest of the surface; in the interspaces much finer threads, the major threads hardly swollen where they override the ribs; on the base the sculpture takes the form of flattish bands appressed on the anterior edge, about four in number, on the canal are only four or five close-set

rounded threads; axial sculpture of (on the last whorl including the terminal varix 10) rounded, rather strong ribs, extending from suture to canal and usually vertically continuous up the spire, the shoulder hardly indicated, the spiral sculpture passing over the ribs without nodulation; the interspaces of the reticulation usually darker colored than the threads; aperture narrow, elongated, with a large rounded and conspicuous anal sulcus; outer lip varicose, thick, sharp edged, internally smooth; inner lip smooth not callous; canal short, wide, hardly differentiated from the aperture. Height of shell, 7; of last whorl, 4; diameter, 2.5 mm. Cat. No. 106488, U.S.N.M.

Range.—Scammon Lagoon, Lower California, on a sand beach between tides; Henry Hemphill.

PHILBERTIA TELAMON, new species.

Plate 18, fig. 5.

Shell minute, snow white, polished, with a dark brown narrow band in front of which the suture is laid; nucleus of one and a half white smooth whorls and four and a half strongly sculptured subsequent whorls; suture distinct, not appressed; spiral sculpture of on the first two whorls one, on the next two, two strong white rounded cords on the periphery and a brown one at the suture, somewhat swollen at their intersections with the ribs and separated by a narrower interspace; on the last whorl there are in front of these three or four similar but slightly smaller white cords and a few small threads on the canal; axial sculpture of (on the last whorl about ten) rounded ribs extending over the whorl but not continuous up the spire and with narrower interspaces; outer lip strongly varicose; anal sulcus distinct, small, shallow, the whorl somewhat constricted at the beginning of the canal; pillar short smooth, canal very short but distinct. Height of shell, 4; of last whorl, 2; diameter, 2 mm. Cat. No. 73927, U.S.N.M.

Range.—Gulf of California, Stearns collection.

This is a very distinct little species, recalling in color some species of *Triforis*.

PHILBERTIA AEGIALEA, new species.

Plate 18, fig. 8.

Shell small, yellowish white, slender, acute, with a small smooth nucleus of a whorl and a half and four and a half subsequent sculptured whorls; suture distinct, not appressed, undulated by the ends of the ribs; whorls with a prominent shoulder; spiral sculpture of small sharp close-set threads covering the whole surface most prominent in the interspaces between the ribs and given a frosty appearance by the intersection of close fine sharp slightly elevated incremental lines; other axial sculpture of (on the last whorl eight) strong rounded ribs with wider interspaces extending to the canal from the preceding

suture and not continuous up the spire; aperture narrow, anal sulcus wide and round but with no marked fasciole or subsutural callus; outer lip thick, infolded, the fine sculpture continued over the front of the fold; inner lip erased, pillar straight, canal very short and wide but distinct. Height of shell, 7; of last whorl, 4; diameter, 3 mm. Cat. No. 274101, U.S.N.M.

Range.—Margarita Bay, Lower California; C. R. Orcutt.

This shell has a curious resemblance in miniature to *Alectrion cooperi*.

Section NANNODIELLA Dall.

Minute Turritidae with a glassy nucleus of several whorls finally developing spiral threads, but otherwise smooth; the adult sculpture predominantly spiral, the anal sulcus large with a projecting margin, the outer lip in front of it thin and much incurved over the aperture; the aperture unarmed, the canal short, the animal inoperculate.

Type.—*Nannodiella nana*, new species.

This group is instituted for a number of minute species which are remarkable for their relatively enormous anal sulcus, often half as large as the aperture. Those so far recognized are inhabitants of the Gulf of California and its vicinity.

PHILBERTIA (NANNODIELLA) NANA, new species.

Plate 20, fig. 7.

Shell minute, thin, whitish with touches of brown near the aperture; nucleus translucent, the apex minute, globular, the whorls rapidly increasing, convex, smooth, except the fourth which develops one or two spiral threads; subsequent whorls four, with a prominent sharp peripheral keel somewhat undulated but not swollen by axial sculpture; the entire space between this keel and the preceding suture is taken up by the arcuately striate nearly smooth, flattish anal fasciole which is appressed at the suture; in front of the peripheral keel is a less prominent keel on which the suture is laid, the space between the two keels is divided into squarish shallow pits by axial ridges; the base is spirally threaded with subequal interspaces, the threads sometimes minutely scabrous from the intersection by axial striation; aperture subtriangular, short, the anal sulcus not quite at the suture, very large and deep the margin projecting; in front of it the thin outer lip is produced and more or less incurved, the inner lip with a wash of callus, the canal distinct, short, recurved. Height of shell, 3.5; of last whorl, 2; diameter, 1.5 mm. Cat. No. 194857, U.S.N.M.

Range.—Off Cacachitas, Gulf of California in 26 fathoms. Also off La Paz in 9 to 10 fathoms mud, and near Cape San Lucas. U. S. Bureau of Fisheries.

This little shell is very abundant in the siftings from the mud at the above localities.

PHILBERTIA (NANNODIELLA) FRATERNALIS, new species.

Plate 20, fig. 5.

Shell similar in size and general aspect to the preceding and best described by a comparative diagnosis. The nucleus is shorter and less acute; the peripheral keel is less prominent and more or less nodulous at intersections with axial sculpture; there is a space between the second keel and the succeeding suture, both the interspaces are strongly latticed; the anal fasciole is conspicuously spirally threaded; the axial sculpture of narrow riblets with wider interspaces extends forward from the peripheral carina which it nodulates and on the last whorl reaches more or less distinctly over the base; there are three instead of two keels near the periphery on the last whorl. Height, 4.75; height of last whorl, 2.5; diameter, 1.75 mm. Cat. No. 271401, U.S.N.M.

Range.—Near Cape San Lucas, Lower California, at Station 2822, in 21 fathoms, sandy bottom. U. S. Bureau of Fisheries steamer *Albatross*.

This would have been regarded as a variety of *nana* had it not been for the constant difference in the nuclear whorls. The sharp angular outlines of *nana* give it a character very different from the present form at first sight. It is comparatively rare.

PHILBERTIA (NANNODIELLA) PHYLIRA, new species.

Plate 20, fig. 6.

Shell small, slender, thin, waxen white, with a narrow purple-brown band in front of the suture in the later whorls, the pillar and canal more or less similarly tinted; nucleus very small, rather blunt, with the latter part spirally threaded, of about one and a half whorls, followed by about six subsequent whorls; spiral sculpture of (on the early whorls one, later two, and on the last whorl three) strong, rather widely separated threads which are prominently nodulous where they cross the ribs and on the spire are feeble in the interspaces; suture appressed, obscure, the anal fasciole inconspicuous behind the first row of nodules; on the base are 3 or 4 distant threads and on the canal a few feeble spirals; axial sculpture (on the last whorl of about 15) narrow sharp nearly vertical ribs with wider interspaces, the general surface between them with more or less prominent incremental sculpture; aperture narrow, anal sulcus feeble, outer lip thin, smooth inside, inner lip smooth, canal distinct, short, straight. Height of shell, 7; of last whorl, 4.25; diameter, 2 mm. Cat. No. 274108, U.S.N.M.

Range.—Panama, in beach drift, James Zetek.

This shell superficially resembles "*Aesopus*" *oldroydi* Arnold, differing from the latter in details of sculpture, being more slender and smaller, etc. It has more the sculpture of a *Nannodiella* than an *Aesopus* and when adult probably has the *Nannodiella* aperture.

PHILBERTIA (? NANNODIELLA) AMYELA, new species.

Plate 20, fig. 8.

Shell minute, thin, white, with a pervious axis and five whorls, exclusive of the nucleus, of which one smooth whorl remains, the apical part being defective; the sculpture begins abruptly and consists of (on the spire two, on the last whorl three) fine very widely spaced spiral threads, with four or five closer threads on the canal; these cross (on the last whorl about 10) slender axial riblets (obsolete on the base) also widely spaced, and at the intersections form minute spinose tubercles; the other axial sculpture consists of microscopic crowded fine threads over the whole surface, more regular and defined than incremental lines; the aperture is ovate, the anal sulcus obscure, the outer lip (immature ?) thin, the pillar lip gyrate, the canal hardly differentiated. Height of shell, 4.5; of last whorl, 2.5; diameter, 1.5 mm. Cat. No. 216944, U.S.N.M.

Range.—Panama, James Zetek.

This shell recalls by its sculpture the *Nannodiella* of the Gulf of California, and if so related would have a different aperture at maturity.

PHILBERTIA HILAIRA, new species.

Plate 23, fig. 6.

Shell small, translucent white, elevated, with two or more smooth nuclear whorls (defective in the specimen) and five subsequent reticulated, moderately rounded, slightly shouldered whorls; suture distinct, not appressed; spiral sculpture of (on the penultimate whorl four) stronger threads the posterior forming the shoulder, and between them in the wider interspaces much finer intercalary threads; on the base the minor threads become close-set and coarser; axial sculpture of (on the last whorl fourteen or more) low threadlike ribs extending to the canal and shortly sigmoid behind the shoulder; aperture narrow, outer lip varicose, within smooth, though the spiral sculpture shining through the translucent shell gives the effect of liration; anal sulcus wide and shallow, canal hardly differentiated. Height of shell, 6.5; of last whorl, 4; diameter, 2.5 mm. Cat. No. 73925, U.S.N.M.

Range.—Gulf of California, Stearns collection.

This species has a higher spire than most of the genus, but can hardly be separated from the others on that ground alone. It is possible that fresh specimens might show traces of color.

PHILBERTIA CRYSTALLINA Gabb.

Plate 13, fig. 1.

Clathurella crystallina GABB, Proc. Cal. Acad., vol. 3, p. 184, 1865.*Clathurella lowei* DALL, Proc. Biol. Soc. Wash., vol. 16, p. 172, 1903.*Range*.—Santa Barbara Channel, California, in 40 fathoms.**PHILBERTIA TRICHODES**, new name.

Plate 19, fig. 3.

Pleurotoma hirsutum DE FOLIN, Méléagrinoles, p. 59, pl. 5, fig. 16, 1867;
not of Bellardi, 1847.*Range*.—Panama Bay.

The figure does not show the acute projection of the nodes.

MANGILIA (CLATHROMANGILIA) LEVIDENSIS Carpenter.

Plate 21, fig. 1.

Mangilia levidensis CARPENTER, Proc. Acad. Nat. Sci. Phila. for 1865, p. 63,
April, 1865.*Range*.—North end of Nunivak Island, Bering Sea, and south to the Aleutians and Puget Sound. The specimen figured is Cat. No. 133239, U.S.N.M.

Carpenter's types from Neeah Bay and Puget Sound were badly worn, imperfect specimens, hardly identifiable. The color of the fresh shell is dark brown, and the sculpture on the last whorl in senile specimens is often more or less obsolete.

MANGILIA (CLATHROMANGILIA) RHYSSA, new species.

Plate 21, fig. 3.

Shell small, brownish, coarsely sculptured, with six whorls exclusive of the (lost) nucleus; suture appressed, somewhat constricted, obscure; upper whorls with two prominent cords crossing the ribs without nodulation, the last whorl with six, the spiral sculpture more prominent than the axial, which consists of (on the last whorl 10) straight axial ribs continuous to the base; there are traces of some fine spiral striation; the interstices of the reticulation are deep and squarish; sutural fasciole obscure, the sulcus very shallow, the aperture short with hardly any canal and no denticulations or lirations. Height of shell, 7; of last whorl, 4; diameter, 2 mm. Cat. No. 55479, U.S.N.M.

Range.—Gulf of California, Stearns collection.**MANGILIA (KURTZIELLA) CYRENE**, new species.

Plate 21, fig. 5.

Shell minute, waxen white, nucleus very small, of one and a half smooth whorls, rapidly enlarging, followed by a minutely reticulated turn, of which the sculpture gradually merges into that of the

adult type of four succeeding moderately rounded whorls separated by a distinct, not appressed suture; spiral sculpture of a prominent sharp thread on the periphery slightly angulating it; above this on the last whorl are two and below it on the base six or seven somewhat smaller threads with wider interspaces followed to the end of the canal by a more adjacent series of similar threads; axial sculpture of (about 10 on the last whorl) rounded ribs extending from the suture over the base with much wider interspaces; incremental lines close-set, sharp, minutely raised, giving a frosted effect to the surface; aperture narrowly ovate, the outer lip thin, sharp, the anal fasciole feebly indicated, the inner lip and pillar smooth, the canal distinct, straight, short, and narrow. Height of shell, 4.25; of last whorl, 2.75; diameter, 1.25 mm. Cat. No. 211384, U.S.N.M.

Range.—Station 2823, off La Paz, Lower California, in about 26 fathoms, broken shell. U. S. Bureau of Fisheries.

It is possible that these shells may not be completely adult and that the aperture may be modified later, but none of the many specimens obtained show any indications of it.

MANGILIA (KURTZIELLA) DANAË, new species.

Plate 21, fig. 6.

Shell minute, whitish, with a narrow brown band below the periphery in front of which the suture is laid; nucleus small with one and a half polished whorls followed by four and a half sculptured whorls; suture distinct, undulated not appressed; spiral sculpture of a strong cord at the periphery angulating the whorls, with smaller threads (sometimes alternated) covering the rest of the surface with about equal interspaces; spiral sculpture of (on the last whorl 10) slightly sigmoid ribs, widest at the periphery, reaching the suture and fading out on the base, with narrower interspaces; on the obscure anal fasciole the interspaces are markedly concave; aperture narrow, the anal sulcus wide, shallow, the outer lip varicose; the inner lip smooth, the pillar straight, the canal hardly differentiated. Height of shell, 4.5; of last whorl, 3; diameter, 1.7 mm. Cat. No. 265920, U.S.N.M.

Range.—Mulege, Gulf of California, Dr. Paul Bartsch.

MANGILIA (KURTZIELLA) HEBE, new species.

Plate 20, fig. 10.

Shell small, yellowish white, slender, acute, with two smooth nuclear and five or six subsequent whorls; spiral sculpture of fine equal uniform threads covering the whole whorl separated by narrow grooves and given a frosty appearance by fine sharp incremental lines; axial sculpture of (on the last whorl eight or nine) narrow rounded ribs extended over the whole whorl with wider interspaces

and somewhat constricted in front of the appressed suture; there is no evident anal fasciole apart from the constriction; aperture narrow, anal sulcus hardly evident, outer lip sharp, moderately varicose, smooth inside, with the spiral sculpture showing through the thin shell; inner lip erased, pillar straight, canal produced but hardly differentiated. Height of shell, 10; of last whorl, 6; diameter, 3.5 mm. Cat. No. 159338, U.S.N.M.

Range.—San Diego Bay, California, C. R. Orcutt.

This belongs to the same group as *P. limonitella* Dall, of the Atlantic coast.

MANGILIA (KURTZIELLA) ARTEAGA ROPERI, new variety.

Plate 22, fig. 5.

Shell small, thin, grayish with a very minute apical followed by two more or less reticulate convex nuclear whorls and four and a half subsequent whorls; suture distinct, not appressed; spiral sculpture of on the upper whorls one strong peripheral cord in front of which on the penultimate whorl is a smaller one and on the last whorl about five smaller ones with wider interspaces, on the canal five or six closer small threads; in the interspaces of the major cords are numerous minute and minutely imbricated close-set threads, giving a rasplike surface; axial sculpture of (on the last whorl nine) narrow rounded threads with wider interspaces, extending from the fasciole to the canal and nodulous at the intersection of the peripheral cord; aperture narrow, simple, anal sulcus feeble, producing hardly any appearance of a fasciole; axis nearly pervious, canal short, straight. Height of shell, 6.5; of last whorl, 4; diameter, 2.5 mm. Cat. No. 150993, U.S.N.M.

Range.—Monterey, California, to Lower California, in 12 to 15 fathoms.

This species belongs to the group represented on the Atlantic coast by such species as *M. limonitella* Dall, *M. cerina* Kurtz and Stimpson, etc., notable for their rasplike minor sculpture. It is more slender than the typical *M. arteaga* and more southern in distribution. The nucleus is usually eroded and then appears smooth. If deemed worthy of a sectional distinction I have suggested the name of *Kurtziella*, with *M. cerina* as the type.

MANGILIA (KURTZIELLA ?) BETA, new species.

Plate 22, fig. 4.

Shell small, yellowish, with a pale canal, a blunt smooth nucleus of two whorls and three and a half subsequent whorls; periphery slightly behind the middle of the whorl; from the distinct suture the surface slopes flatly to the subangular periphery, the rest of the whorl rounded; spiral sculpture of uniform fine threads with narrower interspaces over the whole surface; axial sculpture of (on the

last whorl 15) narrow rather sharp ribs with much wider interspaces, obsolete behind the shoulder and on the base; there are also fine incremental lines which roughen the spiral threads; anal fasciole inconspicuous, anal sulcus feeble; aperture simple, outer lip sharp; axis pervious, pillar attenuated in front, canal short. Height of shell, 5; of last whorl, 3.5; diameter, 2 mm. Cat. No. 206554, U.S.N.M.

Range.—Off Point Año Nuevo, California, in 56 fathoms, mud, bottom temperature 49.2° F. U. S. Bureau of Fisheries steamer *Albatross*.

This shell is quite characteristic, though doubtless immature.

MANGILIA PERATTENUATA Dall.

Plate 20, fig. 11.

Mangilia perattenuata DALL, *Nautilus*, vol. 18, No. 11, p. 123, Mar. 8, 1905.

Range.—Monterey Bay, 10 to 45 fathoms.

This is larger and more slender than the allied *constricta* Gabb.

MANGILIA PAINEI Arnold.

Plate 23, fig. 3.

Mangilia painei ARNOLD, *Pal. San Pedro*, p. 214, pl. 8, fig. 1, 1903.

Shell small, slender, whitish, with one subglobular nuclear and six subsequent whorls, suture distinct, undulated by the sculpture; spiral sculpture on the apical whorls of two cords near the periphery, overrunning the ribs and becoming fainter with each succeeding whorl and quite obsolete on the last two whorls; axial sculpture of (on the last whorl 10 or 11) rounded protractive ribs with subequal interspaces, extending from the fasciole to the succeeding suture and on the earlier whorls from suture to suture; the incremental lines are also distinct but not coarse; anal fasciole feeble, the sulcus obscure; aperture simple, the pillar attenuated in front, canal short. Height of shell, 15; of last whorl, 9; diameter, 4.5 mm. Cat. No. 161420, U.S.N.M.

Range.—San Pedro, California, Mrs. Eshnaur. Also Pleistocene.

First described as a fossil. The strength of the sculpture varies in different specimens.

MANGILIA NUNIVAKENSIS, new species.

Plate 1, fig. 2.

Shell thin, rather large, whitish, acute, elevated, of about seven whorls, the nucleus eroded, suture distinct, the anal fasciole hardly constricted, concavely wrinkled; axial sculpture of (on the penultimate whorl about 18) protractive rather feeble, rounded ribs, with subequal interspaces, becoming obsolete on the base; spiral sculpture practically none; aperture simple, anal sulcus wide and shallow, outer lip arcuate, canal straight. Height of shell, 18; of last whorl, 12; diameter, 6 mm. Cat. No. 220348, U.S.N.M.

Range.—Bering Sea near Nunivak Island, in 9 to 85 fathoms, mud, bottom temperature 39° F. W. H. Dall.

This species belongs to the group including *M. aleutica* and *M. alaskensis* Dall.

MANGILIA OENOA, new species.

Plate 8, fig. 6.

Shell small, feebly sculptured, whitish with a yellowish underlayer, and (on the spire one, on the last whorl two) darker spiral lines; whorls six without the (lost) nucleus; suture distinct, anal fasciole obscure; surface with uniform fine spiral striation; axial sculpture of (on the last whorl about 15) faint narrow riblets extending entirely over the whorl with wider interspaces; aperture narrow, canal short, wide; anal sulcus faint; outer lip thin sharp, body and pillar smooth. Height of shell, 6.5; of last whorl, 4; diameter, 2.5 mm. Cat. No. 153051, U.S.N.M.

Range.—San Pedro, California, to the Gulf of California.

This belongs to the group of *M. variegata* Carpenter, but has much less developed sculpture and color markings.

MANGILIA PHILODICE, new species.

Plate 22, fig. 7.

Shell small, white, with four or more whorls exclusive of the (lost) nucleus; suture distinct, not appressed; whorls sloping behind, rounded in front; axial sculpture of (on the penultimate whorl about 17) short rounded ribs with subequal interspaces, hardly extended over the periphery and gradually becoming obsolete on the last whorl; incremental lines somewhat conspicuous on the base where they slightly reticulate the spiral sculpture; the latter comprises three prominent cords on the periphery equal and equidistant, swollen where they over ride the ribs, and feebler on the last whorl; the anal fasciole carries finer equal spiral threads, the base 10 or more somewhat larger and more nearly adjacent as they approach the canal; aperture rather narrow, outer lip solid, sharp-edged, anal sulcus large, rounded, close to the suture, inner lip erased, canal short, deep, slightly recurved. Height of last and three preceding whorls, 7.5; of last whorl, 5; diameter, 3 mm. Cat. No. 208916, U.S.N.M.

Range.—Station 4454, off Point Pinos Light, Monterey Bay, California, in 65 to 203 fathoms, mud and gravel. U. S. Bureau of Fisheries.

MANGILIA PATAGONIENSIS, new species.

Shell minute, white, with a blunt nucleus of one and a half whorls the apex bulbous, and about four subsequent whorls; suture appressed, and fasciole somewhat concave; axial sculpture of (on the penultimate whorl about 18) short rounded obliquely protractive ribs with

narrower interspaces extending from the succeeding suture to the anterior edge of the anal fasciole and across it as an arcuate thread to the preceding suture; these ribs become more or less obsolete on the last whorl and are feebly if at all produced beyond the periphery; spiral sculpture between the fasciole and the succeeding suture of five or six equal and equidistant strong threads with subequal interspaces on the penultimate whorl and about a dozen on the base of the last whorl, with smaller and closer ones on the canal; the angle at the anterior edge of the fasciole is prominent, the threads are hardly swollen when they pass over the ribs; aperture narrow, the anal sulcus shallow and wide beginning at the suture; outer lip thin, sharp; inner lip erased; pillar and canal straight, the latter distinct but short and deep. Height of shell, 5.5; of last whorl, 3.7; diameter, 3 mm. Cat. No. 122751, U.S.N.M.

Range.—Station 2787, on the west coast of Patagonia in 61 fathoms, mud, bottom temperature 54° F. U. S. Bureau of Fisheries.

This shell looks like a small *Bela*, but has no operculum.

MANGILIA ERIOPIS, new species.

Plate 23, fig. 1.

Shell small, white, polished, having a nucleus with an oblique smooth small apex and about one whorl, the latter part spirally striated, and about six and a half subsequent whorls; spire acute, slender, the whorls moderately rounded, the suture distinct, not appressed; spiral sculpture of a few obscure threads on the back of the canal and on the apical whorls; axial sculpture of (on the last whorl about 15) sigmoid ribs, most prominent at the shoulder, feeble over the anal fasciole and on the base; aperture narrowly ovate, anal sulcus shallow and wide, beginning at the suture; outer lip produced, thin and sharp; inner lip and pillar with a thin wash of enamel; pillar straight, attenuated in front, canal short and narrow. Height of shell, 13.5; of last whorl, 7.5; diameter, 5 mm. Cat. No. 216411, U.S.N.M.

Range.—Forrester Island, southeastern Alaska, collected by G. Willett.

MANGILIA GRANITICA, new species.

Shell small, waxen white, darker on the pillar, with two nuclear and about five subsequent whorls; nucleus flat-topped, the first whorl with one strong keel, the second with three, the suture is laid on the anterior keel, which is smaller, and in the subsequent whorls the suture is not appressed but distinct; spiral sculpture of on the first two whorls a strong peripheral cord and one thread at the suture, on the third whorl three threads in front of the cord, on the remainder four, on the last whorl the peripheral cord is not prominent but from the anal fasciole to the canal are about 16 strong threads with wider

interspaces and an occasional intercalary smaller thread; they do not nodulate when they cross the ribs; on the canal are numerous small close-set threads; the anal fasciole is without spiral sculpture; axial sculpture of (on the last whorl 13) strong rounded ribs not continuous up the spire and obsolete on the base but prominent and arcuate over the fasciole, reaching the preceding suture which they undulate; aperture rather narrow, the anal fasciole at the suture, shallow and wide, the outer lip thin, moderately produced, the inner lip smooth, erased; pillar short, straight, attenuated in front, canal short but distinct. Height of shell, 13; of last whorl, 8; diameter, 5 mm. Cat. No. 208560, U.S.N.M.

Range.—Granite Cove, Port Althorp, Alaska, in about 10 fathoms, gravel; W. H. Dall.

MANGILIA ALTHORPI, new species.

Plate 19, fig. 9.

Shell small, waxen white, superficially resembling *M. granitica* Dall but differing in the following particulars: It has one rib less; the two prominent spiral cords on the early whorls are strongly nodulous when they cross the ribs, especially the posterior cord, even on the last whorl; the spiral sculpture on the last whorl in front of the fasciole comprises 10 strong flattish cords, separated by very sharp, narrow grooves, with no spiral sculpture on the back of the canal, which is distinctly shorter; aperture relatively shorter and wider; the nucleus apparently similar but eroded, the number of whorls is the same but the shell is shorter. Height of shell, 11.5; of last whorl, 6.5; diameter, 4.5 mm. Cat. No. 208560a, U.S.N.M.

Range.—Station 1413, Granite Cove, Port Althorp, Alaska, in about 10 fathoms, gravel, W. H. Dall.

MANGILIA CARLOTTAE, new species.

Plate 21, figs. 9, 12.

Shell small, thin, snow white, with a swollen smooth nucleus of two whorls and six subsequent whorls; suture distinct, not appressed; the anal fasciole sloping forward flatly to the shoulder of the whorl with only arcuate incremental lines for sculpture; axial sculpture of (on the last whorl about 20) obliquely protractive short ribs, strongest at the shoulder and on the last whorl stopping abruptly near the periphery; spiral sculpture hardly perceptible, on the base are a few distant obsolete threads and faint microscopic striae; these vary in strength in different specimens; anal sulcus rounded, wide and shallow; outer lip thin, sharp, arcuately produced; aperture narrowly ovate, inner lip erased; pillar and canal short, the latter wide and hardly differentiated. Height of shell, 9; of last whorl, 5.5; diameter, 4 mm. Cat. No. 210724, U.S.N.M.

Range.—Station 2860, off Queen Charlotte Islands, British Columbia, in 876 fathoms, mud, bottom temperature 36.5° F. U. S. Bureau of Fisheries.

MANGILIA EVADNE, new species.

Plate 23, fig. 2.

Shell small, white, slender, with a smooth swollen nucleus of one and a half whorls and five subsequent whorls; suture constricted, distinct, not appressed, the whorls sloping flatly toward it on both sides; axial sculpture only of faint incremental lines; spiral sculpture of one very prominent keel at the shoulder with one smaller and several still finer threads behind it, the anal fasciole smooth; on the last whorl there are two major threads with much wider interspaces, in front of them about six smaller closer threads to the canal which has about six close-set threads and a marked siphonal fasciole; aperture rather narrow, the anal sulcus deep, rounded, separated by a single thread from the suture; outer lip thin, produced, sharp; inner lip erased, pillar straight; canal distinct, rather wide and recurved. Height of shell, 12; of last whorl, 3.5; diameter, 3 mm. Cat. No. 211334, U.S.N.M.

Range.—Station 2902, off Santa Rosa Island, California, in 53 fathoms sandy mud, bottom temperature 45° F. U. S. Bureau of Fisheries.

This is an odd and extremely distinct species, which recalls some forms of *Cryptogemma*, but is obviously too small for that genus.

MANGILIA ERIPHYLE, new species.

Shell small, solid, whitish, acute, fusiform, with one and a half nuclear and six subsequent whorls; nucleus with a minute apex and a swollen smooth globular succeeding whorl; these are followed by a peripherally keeled whorl, the subsequent turns developing two and then three spiral flattish spiral cords, including the peripheral one and in front of it, while behind the keel the surface slopes flatly up to the appressed suture only interrupted by obscure ridges due to the axial sculpture; on the last whorl in front of the anal fasciole there are about a dozen similar cords extending to the end of the canal with about equal channelled interspaces, the posterior two or three cords more or less nodulous at the intersections; axial sculpture of about 10 more or less prominent riblets beginning in front of the fasciole and extending slightly over the periphery on the last whorl becoming obsolete; the incremental lines not conspicuous; aperture narrowly ovate, the outer lip somewhat varicose with a large shallow rounded anal sulcus close to the suture; within both inner and outer lips are smooth and moderately callous; canal

short, wide, slightly recurved. Height of shell, 10.5; of last whorl, 6; diameter, 4 mm. Cat No. 211326, U.S.N.M.

Range.—Station 2902, off Santa Rosa Island, California, in 53 fathoms sandy mud, temperature 45° F. U. S. Bureau of Fisheries.

The specimens were all dead shells and the color when fresh is therefore doubtful.

MANGILIA HERMIONE, new species.

Plate 19, fig. 6.

Shell small, white, decollate, but originally of five or more whorls exclusive of the nucleus; first two remaining intact whorls (the first is eroded) axially sculptured with about 20 close-set obliquely protractive rounded ribs cut by sharp grooves which make of the interspaces rounded nodules, the second row from the preceding suture being more prominent and forming a shoulder to the whorl; there are five of these rows on the spire, and the ribs they represent extend from suture to suture; on the later whorls they are less prominent, and on the last are obsolete except at the shoulder which is feeble; other spiral sculpture on the last whorl is of fine equal threads with narrower interspaces, extending from the shoulder to the canal; suture distinct, not appressed, whorls well rounded; aperture rather narrow, anal sulcus wide and deep, its deepest part at the shoulder, with no subsutural callus; outer lip thin, sharp, prominently arcuately produced; inner lip erased, pillar short, gyrate, axis not pervious; canal distinct, rather long and wide. Height of three intact whorls, 8; of last whorl, 6.5; diameter at apex, 1.6; of last whorl, 4 mm. Cat. No. 96488, U.S.N.M.

Range.—Station 2807, near Galapagos Islands, in 812 fathoms, ooze, bottom temperature 38.4° F. U. S. Bureau of Fisheries.

MANGILIA LAODICE, new species.

Plate 21, fig. 8.

Shell small, thin, white, with six well-rounded whorls exclusive of the (lost) nucleus, suture appressed, distinct, undulated by the sculpture; spiral sculpture variable sometimes with well marked threads (six on the last whorl) and a finer intercalary thread in the rather wide interspaces, and sometimes with the spirals obsolete or absent; when present the suture may have a thickened edge with one thread on the preceding whorl immediately behind it, or it may be quite simple; axial sculpture of (on the penultimate whorl about a dozen) short, subnodulous, slightly oblique ribs which do not cross the anal fasciole and become obsolete on the base, separated by narrower interspaces; anal fasciole slightly excavated, smooth except for incremental arcuate lines close to the suture; aperture narrow, anal sulcus wide and deep; outer lip thin, sharp,

prominently arcuately produced; inner lip erased, pillar short, attenuated in front, gyrate; axis pervious; canal narrow, short, slightly recurved. Height of shell, 7.7; of last whorl, 6; diameter, 3.5 mm. Cat. No. 207587, U.S.N.M.

Range.—Station 2792, off Manta, Ecuador, in 401 fathoms, mud, bottom temperature 42.9°; U. S. Bureau of Fisheries.

MANGILIA HAMATA Carpenter.

Mangilia hamata CARPENTER, ANN. Mag. Nat. Hist., ser. 3, vol. 15, p. 399, May, 1865.

Carpenter's type specimen is apparently a fossil and resembles the fossils from the Santa Barbara Pleistocene, where Col. E. Jewett also collected. The rather deep anal sulcus and thickened lip remind one of *Cytharella*.

Range.—"Panama," Colonel Jewett. Cat. No. 15951, U.S.N.M.

MANGILIA CESTA, new species.

Plate 21, fig. 7.

Shell small, whitish, polished, with (on the last whorl six or seven) widely spaced narrow brown spiral lines; whorls six without the (lost) nucleus; suture distinct, axial sculpture of ten rounded ribs extending across the whorl with subequal or wider interspaces; the ribs are not shouldered and start from the suture which they undulate; spiral sculpture of incised lines in the interspaces between the ribs, the brown color is situated in these grooves of which there are six or more on the last whorl, rather widely spaced; aperture simple, anal sulcus inconspicuous, canal very short and wide. Height of shell, 7; of last whorl, 4; diameter, 3 mm. Cat. No. 209040, U.S.N.M.

Range.—San Pedro, California, Mrs. Blood.

This shell resembles *Cytharella*, but lacks the peculiar spiral sculpture and shouldered whorls.

MANGILIA NEWCOMBEL, new species.

Plate 21, fig. 4.

Shell small, brownish, with a tendency to banding, paler at the shoulder and on the base, with six whorls, including a small, smooth nuclear whorl; suture distinct, slightly appressed, with no fasciolar constriction; spiral sculpture of fine flattish threads separated by narrow striae very minutely reticulated by the incremental lines and most conspicuous in the intervals between the ribs, practically covering the whole surface of the shell; axial sculpture, beside almost microscopic lines of growth, of (on the last whorl 14) short rounded ribs, slightly angulated at the shoulder and extending from the suture to the canal with subequal interspaces; anal sulcus shallow, aperture narrow, simple, inner lip erased, canal short, straight.

Height of shell, 11; of last whorl, 7; diameter, 4 mm. Cat. No. 150965, U.S.N.M.

Range.—Clayoquot, Vancouver Island, to Drakes Bay, California.

MANGILIA ? DEJANIRA, new species.

Plate 20, fig. 12.

Shell small, brownish, with an acute brown nucleus of four and a half regularly increasing whorls (apparently smooth but slightly eroded), changed abruptly into the sculpture of the five subsequent whorls; axial sculpture of (on the last whorl 10) low rounded ribs with wider interspaces, obsolete on the base and incremental sculpture indicated by the rather distant sharp striae; spiral sculpture of (on the spire two, on the last whorl three) rather prominent nodules on the ribs with no conspicuous cord in the corresponding part of the interspaces; otherwise the spiral sculpture, especially on the latter whorls, comprises sharp narrow grooves with wider flattened interspaces which become more cordlike on the earlier whorls and the base; whorls moderately rounded with no indication of an anal fasciole, the suture distinct but not appressed, aperture in the type-specimen elongate ovate with simple pillar and thin sharp outer lip, the canal short, deep, forming a distinct but small siphonal fasciole and slightly recurved. Height of shell, 11; of last whorl, 5; diameter, 4.5 mm. Cat. No. 267724, U.S.N.M.

Range.—Dredged in Santa Maria Bay, Lower California; Dr. Paul Bartsch.

This species may prove to be a young *Glyphostoma*, but its peculiar incised sculpture will enable it to be distinguished from the other species of the genus. The absence of an anal fasciole, however, would seem to remove it from that group.

MANGILIA ? EURYBIA, new species.

Plate 22, fig. 2.

Shell small, white, with a very pale yellowish periostracum. a smooth inflated nucleus of a whorl and a half and about four subsequent whorls; the first normal whorl has a small peripheral keel. the next two have ribs in addition, the last whorl has only spiral sculpture; suture distinct, not appressed, the whorls well rounded with the anal fasciole close to the suture; spiral sculpture at first of one or two strong threads in the space between the keel and the succeeding suture, on the last whorl the keel is reduced to a flattish cord with four others in front of it, with wider interspaces; on the anterior part of the base and on the canal are feebler closer threads; axial sculpture confined to the spire of about a dozen short obliquely protractive riblets, most conspicuous where they cross the ribs and with subequal interspaces; on the last whorl they disappear; incre-

mental lines feeble; anal fasciole flat with faint spiral lines crossing arcuate lines of growth; anal sulcus wide and shallow; aperture subovate, outer lip thin, sharp; inner lip erased; pillar short, smooth; axis pervious, canal distinct, wide, with no siphonal fasciole. Height of shell, 7; of last whorl, 4.5; diameter, 3 mm. Cat. No. 211762, U.S.N.M.

Range.—Station 2936, off Cape San Quentin, Lower California, in 359 fathoms, mud, bottom temperature 49° F.; U. S. Bureau of Fisheries.

The enlarged figure of this little species is curiously like a *Chryso-domus*.

ZETEKIA DENTICULATA Dall.

Plate 1, fig. 1.

Zetekia denticulata DALL, Proc. U. S. Nat. Mus., vol. 54, No. 2238, p. 320, 1918.

Shell small, fusiform, purplish brown, with a very small smooth translucent nucleus of about three whorls, and four subsequent whorls; suture obscure, closely appressed; spiral sculpture of (between the sutures six) flattish equal close-set uniform cords, of which there are about 14 on the last whorl, with a few smaller threads on the canal; these cords are cut into squarish granules by numerous narrow axial grooves the interspaces on the earlier whorls having a somewhat riblike aspect; this sculpture is fairly uniform over the entire shell except the nucleus; there is no evident anal fasciole; aperture narrow, anal sulcus prominent, rounded; outer lip internally thickened and with about six short coarse lirae; inner lip callous, with four or five short lirations on the pillar, canal very short, deeply cut, contracted. Height of shell, 6; of last whorl, 3.5; diameter, 2 mm. Cat. No. 274109, U.S.N.M.

Range.—In beach drift at Panama; James Zetek.

This shell, though apparently Pleurotomoid, has much the appearance of a *Mitromorpha*, of which the type is *M. filosa* Carpenter,¹ not *M. lirata* A. Adams, as stated by Fischer and Cossmann. The genus is described correctly by Adams as having a single inconspicuous plait anteriorly on the pillar. This plait only appears in completely adult individuals, as do the small internal denticulations of the outer lip. There is no notch at the posterior commissure of the aperture in any of the California species, nor is one mentioned by Adams in the description of *M. lirata* from Japan. The present species has a conspicuous notch but no plication properly speaking on the pillar, only small pustular lirations on the outer edge of the columellar callosity. Cossmann gives the genus two strong plaits on

¹ Ann. Mag. Nat. Hist., vol. 15, March, 1865, p. 182, sole species *M. filosa* Carpenter. A. Adams's description was printed in the April number, p. 322.

the pillar, which, with his figure, indicate that he had a species of *Mitra* in hand, from which his diagnosis was made.

The present species seems entitled to a distinct group name.

DAPHNELLA BARTSCHI, new species.

Plate 19, figs. 4, 5.

Shell small, slender, yellowish white with brown flames and flecks, moderately convex whorls, distinct suture, and six whorls, with a very minute brown nucleus of two whorls; the whole surface is delicately reticulated with subequal axial and spiral threads, the spirals cut by the axial interspaces into minute nodules, the interstices squarish; the surface resulting is grating to the touch; the aperture is narrow, the canal hardly differentiated and not recurved. Height of shell, 8.5; of last whorl, 6; diameter, 5 mm. Cat. No. 267341, U.S.N.M.

Range.—Lower California and the Gulf of California; Dr. Paul Bartsch.

This is much smaller and with more delicate and even sculpture than the related species *D. casta* Hinds, and *D. clathrata* Gabb, both of which have much larger nuclei. *D. effusa* Carpenter from Neeah Bay, Washington, was founded on a broken and worn unidentifiable specimen probably not even belonging to the genus *Daphnella*. *D. electra* Dall is a still smaller and differently colored species, and *D. fuscoligata* Dall has quite a different sculpture and may possibly be a *Clathromangilia*.

CYTHARELLA ACULEA, new species.

Shell small, purple brown, banded with white, or varicolored; nucleus of one and a half loosely coiled, smooth nuclear, and four subsequent whorls; axial sculpture of six, somewhat sigmoid rounded ribs continuous up the spire, with excavated, much wider interspaces, with fine axial striation, which slightly wrinkles the spirals; spiral sculpture of numerous sharp, often paired grooves separated by wider flattish interspaces which are faintly marked by the axial striation; aperture narrow, anal sulcus conspicuous, outer lip thickened, smooth inside, pillar simple, canal hardly differentiated. Height of shell, 6; of last whorl, 3.5; diameter, 2 mm. Cat. No. 73994, U.S.N.M.

Range.—San Diego, California, to Cape San Lucas.

Though small, this is one of the most elegant of the West Coast species. The name was suggested by Doctor Carpenter. Some specimens are more slender than others, and the coloration is variable.

CYTHARELLA SUBDIAPHANA Carpenter.

Plate 24, fig. 4.

Mangelia subdiaphana CARPENTER, ANN. Mag. Nat. Hist., ser. 3, vol. 15, p. 45, July, 1864.

Range.—Cape San Lucas; J. Xantus.

The specimen figured is Carpenter's type, Cat. No. 274104, U.S.N.M. This is one of the species with an elevated spire which approaches *Philbertia*.

CYTHARELLA LOUISA, new species.

Plate 24, fig. 3.

Shell minute, nucleus with a small apex, the whorl later swollen, the second turn with three strong spiral threads, the following three whorls with 11 or 12 axial ribs with subequal interspaces and no pronounced shoulder; spiral sculpture between the sutures of three strong subequal flattish threads somewhat swollen when they override the ribs, and with a few much finer threads in the interspaces between the major threads; the spaces between the reticulation on the earlier whorls are deep and have a pitlike aspect; near the suture in fresh specimens is a dark spiral band extending to the rounded shoulder, in front of which the shell is yellowish white with (on the last whorl) four or five narrow brown spiral lines with much wider interspaces; aperture moderately wide with a very shallow ill-defined sulcus, the outer lip thickened, smooth, the canal wide, not differentiated from the aperture, the inner lip smooth. Height of shell, 4.25; of last whorl, 2.7; diameter, 1.7 mm. Cat. No. 160122, U.S.N.M.

Range.—San Luis Obispo, California, Mrs. Dial.

CYTHARELLA QUADRISERIATA, new species.

Plate 24, fig. 8.

Shell small, stout, blunt, white, with a brown peripheral band and another on the base; nucleus small, blunt, at first smooth and then spirally striated, in all about two whorls followed by five subsequent whorls; axial sculpture of eight rounded ribs, partly continuous up the spire, undulating the suture and with subequal interspaces; faint lines of growth cross the transverse sculpture; spiral ornamentation of almost microscopically fine threads uniform over the shell, with wider flat interspaces; aperture short and wide with no differentiated canal; anal sulcus conspicuous, outer lip thickened, smooth inside. Height, 5; of last whorl, 3; diameter, 2 mm. Cat. No. 55503, U.S.N.M.

Range.—Gulf of California to Acapulco.

This belongs to the same general group as *C. aculea*, but has quite distinct sculpture and is stouter in proportion. Like that species it is variable in its coloration.

CYTHARELLA HIPPOLITA, new species.

Plate 22, figs. 6, 8.

Shell small, slender, whitish, dark brown, or spirally banded with brown and white; nucleus with a very small blunt apical whorl, the succeeding whorl (worn in the specimens) probably feebly sculptured; subsequent whorls about five, with an appressed suture; spiral sculpture of very fine spiral striae, perceptible under magnification, becoming coarser toward the canal; axial sculpture (including the terminal varix) of seven strong ribs with wider interspaces, slightly protractive anteriorly, continuous up the spire around which they show a slight twist, and extending on the last whorl to the canal; aperture narrow, elongated, anal sulcus wide, shallow, outer lip thickened, smooth internally, inner lip simple; canal hardly differentiated. Height of shell, 5.7; of last whorl, 3.5 diameter, 2 mm. Cat. No. 127536, U.S.N.M.

Range.—Shell drift at San Hipolito Point, Lower California, and also at San Diego, California; Hemphill.

Much like *C. aculea*, but constantly stouter and shorter, with one more rib and coarser striation.

CYTHARELLA VERDENSIS, new species.

Shell small, short-fusiform, whitish or feebly dotted with brown, with three brown nuclear and four subsequent whorls; apex of the nucleus very small, smooth, the other two microscopically rugose; suture appressed behind a faint anal fasciole, whorls moderately rounded; spiral sculpture uniform, of fine attenuated close-set spiral threads covering the whole surface and crossed by minutely sharp incremental lines giving a peculiarly rough effect; other axial sculpture of (on the last whorl about 12) rather feeble rounded ribs obsolete anteriorly with about equal interspaces; aperture elongate, narrow with no differentiated canal; the outer lip moderately varicose, sharp-edged, smooth within, the anal sulcus rounded, shallow, close to the suture. Height of shell, 6.5; of last whorl, 5; diameter, 3 mm. Cat. No. 266336, U.S.N.M.

Range.—Agua Verde Bay, Lower California, Dr. Paul Bartsch.

? CYTHARELLA JANIRA, new species.

Plate 21, fig. 10.

Shell small, acute, white or waxen, with a small smooth nucleus of about two whorls and five subsequent moderately rounded whorls; suture distinct, hardly appressed; spiral sculpture of sharp striae

with wider minutely striated interspaces, over the whole surface, not swollen where they pass over the ribs; the whorls are slightly shouldered, there are about three or four of the straplike interspaces on the spire between the shoulder and the succeeding suture, behind the shoulder they are less obvious and the sculpture less coarse; on the last whorl the sculpture is quite uniform; axial sculpture of nine or ten protractively oblique slightly sigmoid ribs which nearly reach the canal and on the spire extend from suture to suture; aperture narrow, the anal sulcus wide and shallow, close to the suture, the outer lip is thickened but not internally lirate; the inner lip smooth; the canal is short, wide, and hardly differentiated from the rest of the aperture. Height of shell, 9; of last whorl, 6; diameter, 3 mm. Cat. No. 55285, U.S.N.M.

Range.—San Diego, California, Stearns collection.

It is possible this may be a *Mangilia* with unusually thickened lip, or an immature *Cytharella*.

CYTHARELLA ELECTRA, new species.

Shell minute, waxen white, sometimes with faint purplish spiral bands, with two and a half nuclear and four and a half subsequent reticulate whorls; nucleus turbinate, the first two whorls smooth, polished, brown, the remainder axially minutely ribbed, the sculpture passing into that of the normal subsequent whorls; suture distinct, not appressed; spiral sculpture between the succeeding suture and the fasciole on the spire, of four equal and equally spaced threads with slightly wider interspaces; rarely the posterior thread is more prominent than the others; on the last whorl there are about nine threads, more adjacent as they approach the canal which has about six more closely set; axial sculpture of (on the last whorl about 14) low narrow straight ribs extending from the suture to the canal with slightly narrower interspaces; there is no nodulation at the intersections with the spiral sculpture and the reticulations are squarish and deep; aperture narrow, anal sulcus shallow, rounded, conspicuous; outer lip varicose, sharp edged, not lirate within; inner lip erased, canal hardly differentiated. Height of shell, 5.5; of last whorl, 3.7; diameter, 2 mm. Cat. 267706, U.S.N.M.

Range.—Head of Concepcion Bay, Gulf of California, Dr. Paul Bartsch.

The general aspect except for the sulcus is that of a *Mitromorpha*.

CYTHARELLA NIOBE, new species.

Plate 23, figs. 4, 5.

Shell small, whitish, with or without pale bands or clouds of light brown, fusiform, the nucleus with a minute smooth translucent apex, the succeeding whorl sharply spirally striated, this sculpture followed by minute reticulation for about half a whorl and then by the

normal adult sculpture on five succeeding whorls; spiral sculpture of fine equal close-set threads, covering the posterior half of the whorl and on the anterior half similar but slightly larger threads, while on the fourth whorl there is one, on the fifth and sixth whorls two, and on the last whorl three, slightly larger threads near the periphery which are somewhat swollen where they override the ribs; between the peripheral pair of these are three or four of the minor threads; axial sculpture of eight rounded nearly vertical ribs extending from suture to suture on the spire and nearly to the canal on the last whorl with subequal interspaces, not continuous over the suture which is distinct and not appressed; the whorls are moderately convex; aperture rather narrow, the anal sulcus proportionately large and rounded, the outer lip varicose and infolded, with a sharp edge; the throat smooth, white; the inner lip smooth, the pillar very short, straight, the canal hardly differentiated. Height of shell, 6.5; of last whorl, 5; diameter, 2.2 mm. Cat. No. 274105, U.S.N.M.

Range.—Panama, in beach drift; James Zetek.

CYTHARELLA AMATULA, new species.

Plate 21, fig. 2.

Shell small, pale waxen yellow, with occasional brown spots between the ribs, with about one and a half smooth white nuclear and about five and a half subsequent whorls; axial sculpture of (on the last whorl eight) stout protractively arcuate ribs with subequal or narrower interspaces not continuous up the spire, but extending from the suture over a slight shoulder to the canal; spiral sculpture of numerous fine sharp striae covering the shell (except on the anal fasciole) with flattish wider interspaces; there is a slight angle at the shoulder; aperture narrow, the outer lip infolded, the anal sulcus large, the canal hardly differentiated, the pillar smooth. Height, 6.5; diameter, 3.0 mm. Cat. No. 127534a, U.S.N.M.

Type-locality.—San Diego, California.

This is one of the species which approaches in form the *Mangilia* type.

CYTHARELLA PHAETHUSA, new species.

Plate 24, fig. 1.

Shell minute, with a very small turbinate brown nucleus of about two and a half whorls, the latter part of which is feebly reticulately sculptured, and three and a half subsequent whorls; suture distinct, not appressed, whorls moderately rounded, whitish with a pinkish brown banded base; spiral sculpture of (on the first whorl one, on the second two) peripheral strong threads, on the last whorl four with much wider striated interspaces; these threads on dead specimens show paler than the general surface; on the base and canal are about a dozen smaller close-set threads; none of the threads

are nodulose where they cross the ribs; axial sculpture of (on the last whorl eight) narrow sigmoid ribs, with wider interspaces, extending from suture to canal across the last whorl; the aperture narrow, the outer lip varicose, smooth within; the inner lip simple, not callous; the anal sulcus large and shallow, the pillar straight, the canal hardly differentiated. Height of shell, 3.25; of last whorl, 2; diameter, 1.25 mm. Cat. Nos. 269171 and 268038*b*, U.S.N.M.

Range.—Head of Concepcion Bay, Lower California, Dr. Paul Bartsch.

Many of the specimens have the last whorl conspicuously striped with brown. The dead specimens are often slaty with pale spiral threads. There is also some variation in stoutness and in the strength of the posterior thread which in a few specimens is stronger than the others giving a slight shoulder to the whorl.

CYTHARELLA (AGATHOTOMA) PYRRHULA, new species.

Plate 24, fig. 6.

Shell small, brownish with a white peripheral band, brilliantly polished; with a pointed nucleus of two smooth rounded and one peripherally sharply keeled whorls; and about six subsequent whorls; suture distinct, appressed, fasciole constricted; spiral sculpture of about a dozen grooves with wider interspaces on the base and canal; axial sculpture of (on the last whorl 13) narrow sigmoid ribs extending from the fasciole to the canal with somewhat wider smooth interspaces; aperture contracted, anal sulcus large, with flaring margin and subsutural callus; outer lip sharp edged, infolded, a prominent varix behind it, and under the varix internally a thickened ridge with about five short oblique lirae; inner lip erased; pillar longer with about six lirae; canal short, deep, moderately recurved. Height of shell, 11; of last whorl, 6.5; diameter, 5 mm. Cat. No. 96590, U.S.N.M.

Range.—Station 2830, off Lower California, northwest of Cape San Lucas, in latitude 23° 33' N., in 66 fathoms, sand. U. S. Bureau of Fisheries.

CYTHARELLA (AGATHOTOMA) EURYCLEA, new species

Plate 24, figs. 5, 11.

Shell minute, whitish or pale brownish, subcylindric, turritid, the nucleus with a projecting minute subglobular apex and about one and a half smooth whorls followed by about four and a half sculptured whorls; spiral sculpture of minute close-set threads covering uniformly the whole surface; suture distinct, appressed, the whorls shouldered immediately in front of it; axial sculpture of (on the last whorl seven or eight) prominent, slightly protractively oblique ribs, with wider interspaces, extending over the whole whorl and

prominent at the shoulder, but not continuous over the spire; aperture narrow. outer lip varicose, thick, striated in front, smooth within, the anal sulcus conspicuous but not deep; inner lip smooth, the canal hardly differentiated. Height of shell, 5; of last whorl, 3.5; diameter, 1.75 mm. Cat. Nos. 268908 and 267640, U.S.N.M.

Range.—Dredged at Agua Verde Bay and the head of Concepcion Bay, Lower California, Dr. Paul Bartsch.

CYTHARELLA (AGATHOTOMA) PENELOPE, new species.

Plate 24, fig. 10.

Shell minute, pale brownish, or whitish with obscure brownish spiral bands, with a minute trochoid nucleus of three whorls the earlier smooth, the last axially minutely closely ribbed, followed by five subsequent whorls; suture distinct, hardly appressed, the whorl sloping steeply away from it; spiral sculpture of fine close-set threads over the entire surface; whorls moderately convex; axial sculpture of (on the last whorl six) prominent ribs, with much wider interspaces, extending the whole length of the whorl and on the spire more prominent at the periphery; aperture narrow, parallel-sided, the outer lip varicose, smooth within, the anal sulcus wide and shallow, the canal hardly differentiated. Height of shell, 5; of last whorl, 3; diameter, 2 mm. Cat. No. (268908a) 266346, U.S.N.M.

Range.—Agua Verde Bay, Lower California, Dr. Paul Bartsch. Some specimens are slightly larger, others smaller.

CYTHARELLA (AGATHOTOMA) CAMARINA, new species.

Plate 24, fig. 9.

Shell small, white, hexagonal, with a blunt glassy nucleus of a whorl and a half and about five subsequent whorls; surface showing no spiral sculpture under a hand lens; axial sculpture of six strong rounded ribs, running the whole length of the shell and continuous over the spire; suture distinct; aperture narrow, with a relatively large rounded anal sulcus, a thickened outer lip without internal liration, the inner lip simple not callous, the pillar short, the canal hardly differentiated. Height of shell, 6; of last whorl, 4.5; diameter, 2.5 mm. Cat. No. 122125, U.S.N.M.

Range.—Indefatigable Island, Galapagos Islands, on the beach. U. S. Bureau of Fisheries.

CYTHARELLA (AGATHOTOMA) PHRYNE, new species.

Plate 24, fig. 12.

Shell small, fusiform, short, stout, whitish, with three obscure pale brownish spiral bands on the last whorl; nucleus minute, translucent, of about one whorl with somewhat over four subsequent whorls; suture appressed, obscure; spiral sculpture of numerous very fine equal close-set threads over the whole surface; axial sculp-

ture of seven strong rounded somewhat sigmoid ribs, slightly shouldered near the suture, continuous up the spire and obliquely retractive posteriorly; there are no obvious incremental lines; the ribs extend from the canal to the suture on the last whorl; aperture narrow, anal sulcus shallow, rounded; outer lip broadly infolded, smooth within; inner lip smooth, not callous, canal hardly differentiated. Height of shell, 6.2; of last whorl, 4; diameter, 2.5 mm. Cat. No. 274106, U.S.N.M.

Range.—In beach drift at Panama, James Zetek.

TARANIS PANOPE, new species.

Plate 9, fig. 2.

Shell small, of about six whorls including the blunt (defective) nucleus, white with pale olivaceous periostracum, short and stumpy; earlier whorls with two strong peripheral keels and a thread upon which the suture is laid; last whorl with a cord at the suture and on the other side of the anal fasciole about five elevated keels with subequal interspaces, more adjacent on the base with about as many more smaller and closer threads on the anterior region; suture appressed, obscure; anal fasciole concave, not spirally striated; axial sculpture of rather close sharp striae which cut the spirals; aperture narrow, anal sulcus deep, rounded; outer lip greatly produced, thin, smooth within, inner lip with a wash of callus, canal distinct but very short. Height of shell, 4.5; of last whorl, 2.6; diameter, 2.3 mm. Cat. No. 207577, U.S.N.M.

Range.—Station 2792, off Manta, Ecuador, in 401 fathoms, mud, bottom temperature 42.9° F. U. S. Bureau of Fisheries.

TARANIS ZEUXIPPE, new species.

Plate 3, fig. 3.

Shell minute, white or warm brown, with a turbinate nucleus having a minute smooth apex and three later axially concavely arcuate ribbed whorls; subsequent whorls three and a half with a distinct suture; spiral sculpture between the sutures of two prominent keels and an anterior smaller one on which the suture is laid; on the last whorl there are about eight minor threads in front of those mentioned, all with wider interspaces; axial sculpture of prominent oblique lines protractively cutting the interspaces; anal sulcus shallow, distinct, close to the suture; outer lip thin, slightly produced, inner lip erased; pillar short, straight, canal hardly differentiated. Height of shell, 3.8; of last whorl, 2.2; diameter, 2 mm. Cat. No. 194965, U.S.N.M.

Range.—Station 2813, among the Galapagos Islands, in 40 fathoms, sand, temperature at surface 81° F. U. S. Bureau of Fisheries.

REFERENCES TO GROUPS.

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| <i>Bellaspira</i> , p. 29. | <i>Laevitectum</i> , p. 19. |
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| <i>Crassispira</i> , p. 21. | <i>Nannodiella</i> , p. 59. |
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| <i>Knefastia</i> , p. 3. | <i>Zetekia</i> , p. 73. |

EXPLANATION OF PLATES.

PLATE 1.

- FIG. 1. *Zetekia denticulata* Dall, Alt. 6 mm.; p. 73.
 2. *Mangilia nunivakensis* Dall, Alt. 18 mm.; p. 65.
 3. *Elaeocyma aerope* Dall, Alt. 16 mm.; p. 13.
 4. *Turricula (Surcula) laysanica* Dall, Alt. 52 mm.; p. 3.
 5. *Turricula (Surcula) panthea* Dall, Alt. 47 mm.; p. 4.
 6. *Turricula (Surcula) lavinia* Dall, Alt. 49 mm.; p. 4.

PLATE 2.

- FIG. 1. ? *Clathrodrillia castianira* Dall, Alt. 10 mm.; p. 15.
 2. *Clathrodrillia andromeda* Dall, Alt. 16.5 mm.; p. 16.
 3. *Clathrodrillia (Kylix) aleyone* Dall, Alt. 15 mm.; p. 20.
 4. *Clathrodrillia resina* Dall, Alt. 50 mm.; p. 16.
 5. *Turricula libya* Dall, Alt. 40 mm.; p. 2.
 6. *Turricula nigricans* Dall, Alt. 38 mm.; p. 3.

PLATE 3.

- FIG. 1. *Elaeocyma acolia* Dall, Alt. 7 mm.; p. 11.
 2. ? *Leucosyrinx galapagana* Dall, Alt. 20 mm.; p. 5.
 3. *Taranis zeuxippe* Dall, Alt. 3.8 mm.; p. 81.
 4. *Pleurotomella thalassica* Dall, Alt. 10 mm.; p. 51.
 5. *Pleurotomella oceanida* Dall, Alt. 12 mm.; p. 51.
 6. *Pleurotomella herminea* Dall, Alt. 19 mm.; p. 50.
 7. *Leucosyrinx amycus* Dall, Alt. 52 mm.; p. 5.
 8. *Leucosyrinx kineaidi* Dall, Alt. 29 mm.; p. 6.

PLATE 4.

- FIG. 1. *Elaeocyma empyrosia* Dall, Alt. 31 mm.; p. 12.
 2. *Elaeocyma aegina* Dall, Alt. 13 mm.; p. 12.
 3. *Elaeocyma arbela* Dall, Alt. 13.7 mm.; p. 10.
 4. *Elaeocyma halocydne* Dall, Alt. 18 mm.; p. 11.
 5. *Elaeocyma abdera* Dall, Alt. 15 mm.; p. 12.
 6. *Elaeocyma ianthe* Dall, Alt. 17 mm.; p. 9.

PLATE 5.

- FIG. 1. *Clathrodrillia paziana* Dall, Alt. 13 mm.; p. 14.
 2. *Clathrodrillia callianira* Dall, Alt. 16 mm.; p. 16.
 3. *Clathrodrillia (Carinodrillia) thestia* Dall, Alt. 14 mm.; p. 18.
 4. *Clathrodrillia (Carinodrillia) halis* Dall, Alt. 20 mm.; p. 17
 5. *Clathrodrillia (Carinodrillia) haliplexa* Dall, Alt. 27 mm.; p. 19.
 6. *Clathrodrillia (Carinodrillia) alcestis* Dall, Alt. 30 mm.; p. 18.

PLATE 6.

- FIG. 1. *Crassispira bacchia* Dall, Alt. 14.5 mm.; p. 25.
 2. *Crassispira amathea* Dall, Alt. 22 mm.; p. 27.
 3. *Crassispira dirce* Dall, Alt. 23.5 mm.; p. 22.
 4. *Crassispira arsinoë* Dall, Alt. 17 mm.; p. 26.
 5. *Crassispira tepocana* Dall, Alt. 19 mm.; p. 25.
 6. *Crassispira candace* Dall, Alt. 7 mm.; p. 22.

PLATE 7.

- FIG. 1. *Crassispira nephele* Dall, Alt. 13 mm.; p. 23.
 2. *Crassispira appressa* Carpenter, Alt. 7.5 mm.: p. 22.
 3. *Lora brachis* Dall, Alt. 4.5 mm.; p. 41.
 4. *Crassispira epicasta* Dall, Alt. 9 mm.; p. 24.
 5. *Crassispira eurynome* Dall, Alt. 10 mm.; p. 21.
 6. ? *Crassispira rugitecta* Dall, Alt. 30.5 mm.; p. 26.
 7. *Crassispira bridgesi* Dall, Alt. 11 mm.; p. 24.
 8. *Crassispira erigone* Dall, Alt. 20.6 mm.; p. 21.

PLATE 8.

- FIG. 1. *Moniliopsis halcyonis* Dall, Alt. 23 mm.; p. 29.
 2. *Moniliopsis grippi* Dall, Alt. 27 mm.; p. 27.
 3. *Moniliopsis fancherae* Dall, Alt. 10.5 mm.; p. 28.
 4. *Cymatosyrinx ferminiana* Dall, Alt. 14.2 mm.; p. 7.
 5. *Moniliopsis rhines* Dall, Alt. 18 mm.; p. 28.
 6. *Mangilia oenoa* Dall, Alt. 6.5 mm.; p. 66.

PLATE 9.

- FIG. 1. *Antiplanes amphitrite* Dall, Alt. 13.5 mm.; p. 37.
 2. *Taranis panope* Dall, Alt. 4.5 mm.; p. 81.
 3. *Cryptogemma cynothoë* Dall, Alt. 9 mm.; p. 31.
 4. *Cryptogemma polycaste* Dall, Alt. 13.5 mm.; p. 30.
 5. *Antiplanes abarbarea* Dall, Alt. 21.5 mm.; p. 35.
 6. *Antiplanes hyperia* Dall, Alt. 12 mm.; p. 35.
 7. *Cryptogemma polycaste* Dall, Alt. 14.9 mm.; adult, aperture defective,
 p. 30.
 8. *Cryptogemma calypso* Dall, Alt. 11 mm.; p. 31.
 9. *Cryptogemma quentinensis* Dall, Alt. 12 mm.; p. 32.

PLATE 10.

- FIG. 1. *Antiplanes kamchatica* Dall, Alt. 51 mm.; p. 33.

PLATE 11.

- FIG. 1. *Antiplanes litus* Dall, Alt. 16 mm.; p. 34.
2. *Cryptogemma chrysothemis* Dall, Alt. 16.5 mm.; p. 31.
3. *Antiplanes santarosana* Dall, Alt. 36 mm.; p. 36.
4. *Cryptogemma antigone* Dall, Alt. 23 mm.; p. 32.
5. *Antiplanes amycus* Dall, Alt. 21.5 mm.; p. 36.
6. *Antiplanes thalaca* Dall, Alt. 40 mm.; p. 37.
7. *Antiplanes bulimoides* Dall, Alt. 31 mm.; p. 34.

PLATE 12.

- FIG. 1. *Borsonella nicoli* Dall, Alt. 22 mm.; p. 39.
2. *Borsonella nychia* Dall, Alt. 12 mm.; p. 38.
3. *Borsonella rhodope* Dall, Alt. 19 mm.; p. 39.
4. *Borsonella omphale* Dall, Alt. 16 mm.; p. 38.
5. *Moniliopsis ophioderma* Dall, Alt. 38 mm.; p. 28.
6. *Borsonella barbarentis* Dall, Alt. 29 mm.; p. 37.
7. *Moniliopsis incisa* Carpenter, Alt. 38 mm.; p. 28.

PLATE 13.

- FIG. 1. *Philbertia crystallina* Gabb, Alt. 7.7 mm.; p. 62.
2. ?*Lora equatorialis* Dall, Alt. 13.5 mm.; p. 44.
3. *Clathrodrillia limans* Dall, Alt. 7 mm.; p. 14.
4. ?*Crassispira martinensis* Dall, Alt. 18 mm.; p. 27.
5. *Lacvitectum eburneum* Carpenter, Alt. 30 mm.; p. 19.
6. *Lora rugulata* Troschel, Alt. 16 mm.; p. 50.

PLATE 14.

- FIG. 1. *Lora tabulata* Carpenter, Alt. 11 mm.; p. 45.
2. *Lora miona* Dall, Alt. 8 mm.; p. 47.
3. *Lora kyskana* Dall, Alt. 10.5 mm.; p. 47.
4. *Lora lotta* Dall, Alt. 7.5 mm.; p. 47.
5. *Lora excurvata* Carpenter, Alt. 7.2 mm.; p. 46.
6. *Lora surana* Dall, Alt. 9 mm.; p. 45.
7. *Lora chiachiana* Dall, Alt. 20 mm.; p. 43.
8. *Lora popovia* Dall, Alt. 13 mm.; p. 42.
9. *Lora pavlova* Dall, Alt. 18.5 mm.; p. 43.

PLATE 15.

- FIG. 1. *Lora regulus* Dall, Alt. 8 mm.; p. 48.
2. *Lora quadra* Dall, Alt. 8 mm.; p. 46.
3. *Lora krausci* Dall, Alt. 9.5 mm.; p. 46.
4. *Lora tenuilirata* Dall, Alt. 22 mm.; p. 42.
5. *Lora tenuissima* Dall, Alt. 15 mm.; p. 49.
6. *Lora laurenciana* Dall, Alt. 13 mm.; p. 43.
7. *Lora alitakensis* Dall, Alt. 20 mm.; p. 43.
8. *Lora nazanensis* Dall, Alt. 11 mm.; p. 45.
9. *Lora montercalis* Dall, Alt. 12 mm.; p. 46.

PLATE 16.

- FIG. 1. *Lora mitrata* Dall, Alt. 24 mm.; p. 43.
2. *Lora colpoica* Dall, Alt. 11 mm.; p. 50.
3. *Lora pribilova* Dall, Alt. 12 mm.; p. 44.
4. *Lora tenuilirata cymata* Dall, Alt. 23 mm.; p. 42.

5. *Lora lütkeni* Dall, Alt. 8 mm.; p. 48.
6. *Lora halitropa* Dall, Alt. 6 mm.; p. 40.
7. *Lora pitysa* Dall, Alt. 5.5 mm.; p. 40.
8. *Lora healyi* Dall, Alt. 15 mm.; p. 42.
9. *Lora inequita* Dall, Alt. 11 mm.; p. 44.
10. *Lora diegensis* Dall, Alt. 8.5 mm.; p. 46.
11. *Lora althorpensis* Dall, Alt. 6.5 mm.; p. 49.
12. *Lora sixta* Dall, Alt. 8 mm.; p. 49.

PLATE 17.

- FIG. 1. *Glyphostoma adana* Dall, Alt. 10 mm.; p. 52.
2. *Glyphostoma thalassoma* Dall, Alt. 19.5 mm.; p. 52.
 3. *Glyphostoma sirena* Dall, Alt. 10 mm.; p. 53.
 4. *Glyphostoma partefilosa* Dall, Alt. 11 mm.; p. 53.
 5. *Glyphostoma adria* Dall, Alt. 10 mm.; p. 52.
 6. *Glyphostoma cymodoce* Dall, Alt. 11.5 mm.; p. 54.

PLATE 18.

- FIG. 1. *Philbertia scammoni* Dall, Alt. 7 mm.; p. 57.
2. *Philbertia helena* Dall, Alt. 3.5 mm.; p. 55.
 3. *Philbertia dictynna* Dall, Alt. 3.8 mm.; p. 57.
 4. *Philbertia doris* Dall, Alt. 5.2 mm.; p. 55.
 5. *Philbertia telamon* Dall, Alt. 4 mm.; p. 58.
 6. *Philbertia aethra* Dall, Alt. 8 mm.; p. 57.
 7. *Elaeocyma attalia* Dall, Alt. 8.5 mm.; p. 10.
 8. *Philbertia aegiotea* Dall, Alt. 7 mm.; p. 58.

PLATE 19.

- FIG. 1. *Lora antipoda* Dall, Alt. 5 mm.; p. 41.
2. *Cryptogemma adrastia* Dall, Alt. 16 mm.; p. 33.
 3. *Philbertia trichodes* Dall, Alt. 4 mm.; p. 62.
 4. *Daphnella bartschi* Dall, Alt. 9 mm.; p. 74.
 5. *Daphnella bartschi* Dall, another specimen with immature lip, less enlarged, Alt. 9 mm.; p. 74.
 6. ? *Mangilia hermione* Dall, Alt. 8 mm.; p. 70.
 7. *Cymatosyrinx palmeri* Dall, Alt. 9.5 mm.; p. 8.
 8. *Bellaspira melea* Dall, Alt. 12 mm.; p. 29.
 9. *Mangilia althorpi* Dall, Alt. 11.5 mm.; p. 68.

PLATE 20.

- FIG. 1. *Cymatosyrinx elissa* Dall, Alt. 7 mm.; p. 6.
2. *Cymatosyrinx hespera* Dall, Alt. 9 mm.; p. 6.
 3. *Cymatosyrinx lalage* Dall, Alt. 8 mm.; p. 7.
 4. *Cymatosyrinx plicatella* Dall, Alt. 7 mm.; p. 7.
 5. *Nannodiella fraternalis* Dall, Alt. 4.75 mm.; p. 60.
 6. ? *Nannodiella phylira* Dall, immature, Alt. 7 mm.; p. 60.
 7. *Nannodiella nana* Dall, Alt. 3.5 mm.; p. 59.
 8. *Nannodiella amyela* Dall, immature, Alt. 4.5 mm.; p. 61.
 9. *Cymatosyrinx hecuba* Dall, the aperture defective; Alt. 11 mm.; p. 9.
 10. *Mangilia (Kurtziella) hebe* Dall, Alt. 10 mm.; p. 63.
 11. *Mangilia perattenuata* Dall, Alt. 10 mm.; p. 65.
 12. ? *Mangilia dejanira* Dall, Alt. 11 mm.; p. 72.

PLATE 21.

- FIG. 1. *Clathromangilia levidensis* Carpenter, Alt. 17 mm.; p. 62.
 2. *Cythereella amatula* Dall, Alt. 6.5 mm.; p. 78.
 3. *Clathromangilia rhyssa* Dall, Alt. 7 mm.; p. 62.
 4. *Mangilia newcombei* Dall, Alt. 11 mm.; p. 71.
 5. *Mangilia* (*Kurtziella*) *cyrene* Dall, Alt. 4.25 mm.; p. 62.
 6. *Mangilia* (*Kurtziella*) *danae* Dall, Alt. 4.5 mm.; p. 63.
 7. *Mangilia cesta* Dall, Alt. 7 mm.; p. 71.
 8. *Mangilia laodice* Dall, Alt. 7.7 mm.; p. 70.
 9. ? *Mangilia carlottae* Dall, Alt. 9 mm.; p. 68.
 10. *Cythereella janira* Dall, Alt. 9 mm.; p. 76.
 11. *Cymatosyrinx idothea* Dall, the aperture defective; Alt. 9 mm.; p. 8.
 12. ? *Mangilia carlottae* Dall, variety, Alt. 19 mm.; p. 68.

PLATE 22.

- FIG. 1. *Antiplanes briseis* Dall, Alt. 18 mm.; p. 35.
 2. ? *Mangilia eurybia* Dall, Alt. 7 mm.; p. 72.
 3. *Pseudomelatoma penicillata* Carpenter, Alt. 33 mm.; p. 21.
 4. *Mangilia* (*Kurtziella*) *beta* Dall, Alt. 5 mm.; p. 64.
 5. *Mangilia* (*Kurtziella*) *roperi* Dall, Alt. 6.5 mm.; p. 64.
 6. *Cythereella hippolita* Dall, Alt. 6 mm.; p. 76.
 7. *Mangilia philodice* Dall, Alt. 7.5 mm.; p. 66.
 8. *Cythereella hippolita* Dall, Alt. 5.7 mm.; p. 76.

PLATE 23.

- FIG. 1. *Mangilia eriopsis* Dall, Alt. 13.5 mm.; p. 67.
 2. *Mangilia evadne* Dall, Alt. 12 mm.; p. 69.
 3. *Mangilia painei* Arnold, Alt. 15 mm.; p. 65.
 4. *Cythereella niobe* Dall, adult, Alt. 6.5 mm.; p. 77.
 5. *Cythereella niobe* Dall, a younger specimen.
 6. *Philbertia hilaira* Dall, Alt. 6 mm.; p. 61.

PLATE 24.

- FIG. 1. *Cythereella phaethusa* Dall, Alt. 3.25 mm.; p. 78.
 2. *Antiplanes agamedea* Dall, Alt. 10.5 mm.; p. 33.
 3. *Cythereella louisa* Dall, Alt. 4.25 mm.; p. 75.
 4. *Cythereella subdiaphana* Carpenter, Alt. 5 mm.; p. 75.
 5. *Cythereella* (*Agathotoma*) *euryclea* Dall, Alt. 5 mm.; p. 79.
 6. *Cythereella* (*Agathotoma*) *pyrrhula* Dall, Alt. 11 mm.; p. 79.
 7. ? *Haedropleura melita* Dall, Alt. 5.2 mm.; p. 30.
 8. *Cythereella quadriseriata* Dall, Alt. 5 mm.; p. 75.
 9. *Cythereella* (*Agathotoma*) *camerina* Dall, Alt. 6 mm.; p. 80.
 10. *Cythereella* (*Agathotoma*) *penelope* Dall, Alt. 5 mm.; p. 80.
 11. *Cythereella* (*Agathotoma*) *curyclea* Dall, variety, Alt. 5 mm.; p. 79.
 12. *Cythereella* (*Agathotoma*) *phryne* Dall, Alt. 6 mm.; p. 80.



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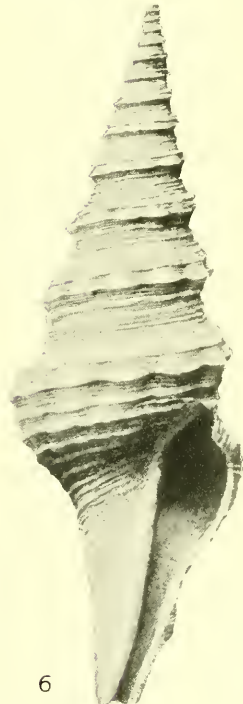
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 82



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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 82



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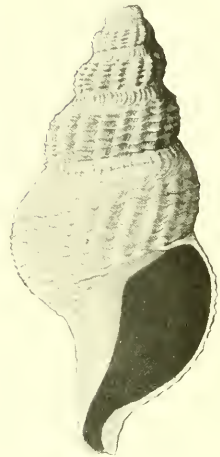
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 82



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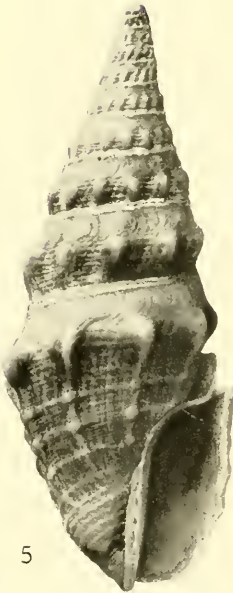
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 82



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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 83



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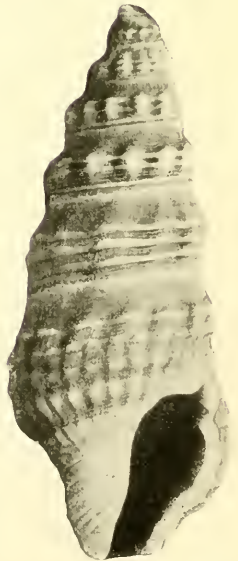
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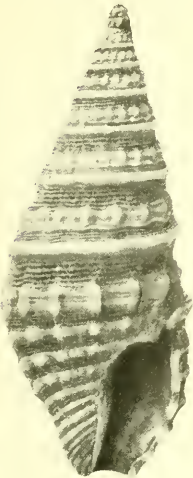
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 83



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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 83



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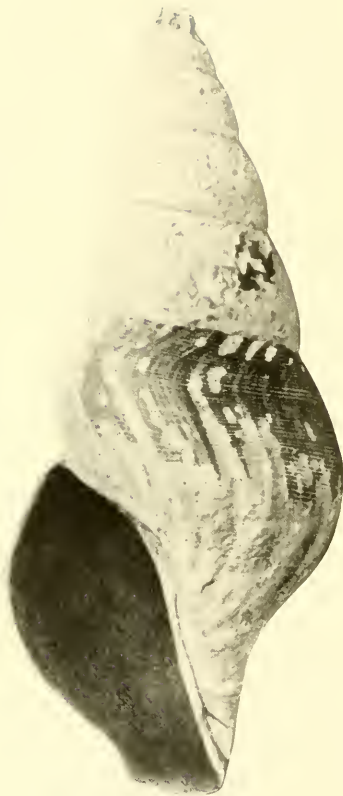
NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 83



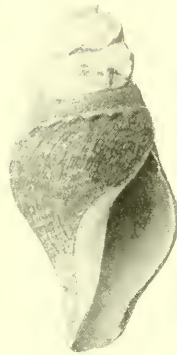
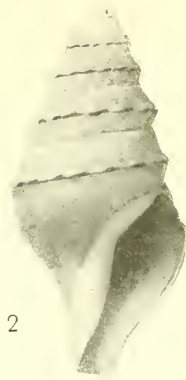
NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 83



NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 83



NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 84



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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 84



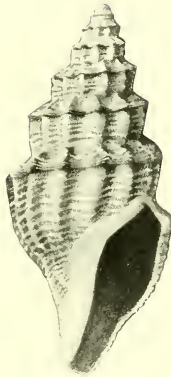
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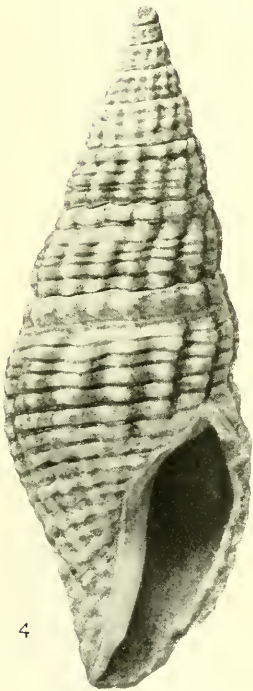
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 84



NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 84



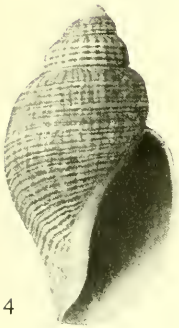
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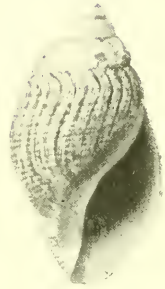
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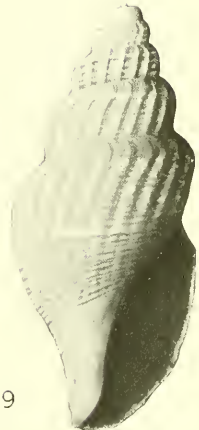
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 84.



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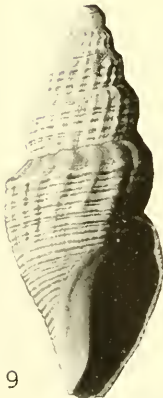
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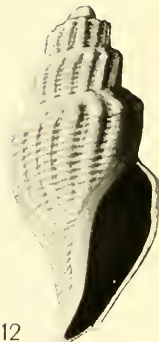
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGES 84 AND 85



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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 85



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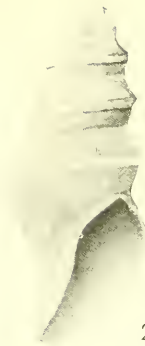
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 85



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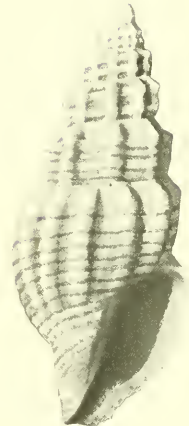
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 85



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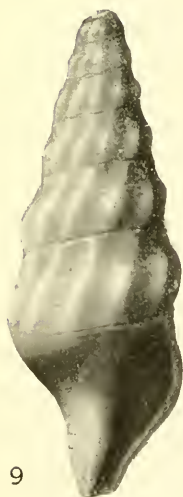
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

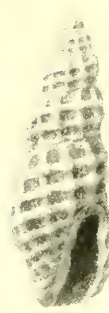
FOR EXPLANATION OF PLATE SEE PAGE 85



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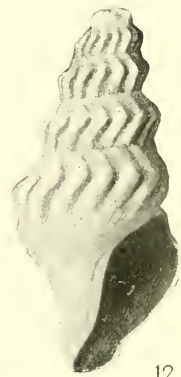
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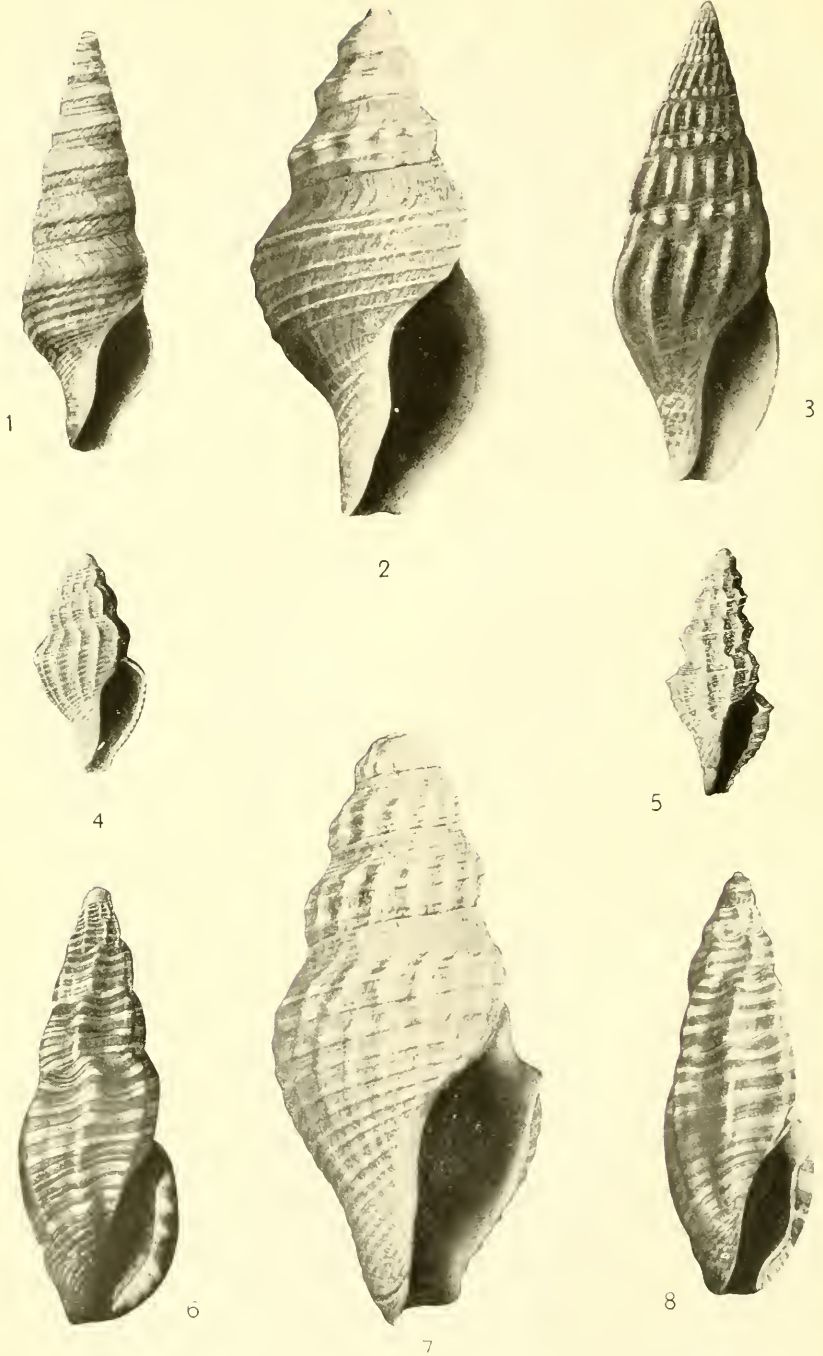
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 86



NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 22



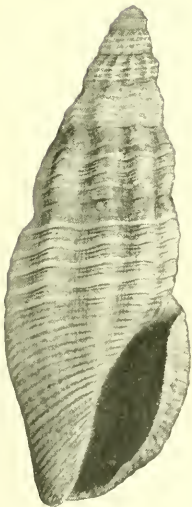
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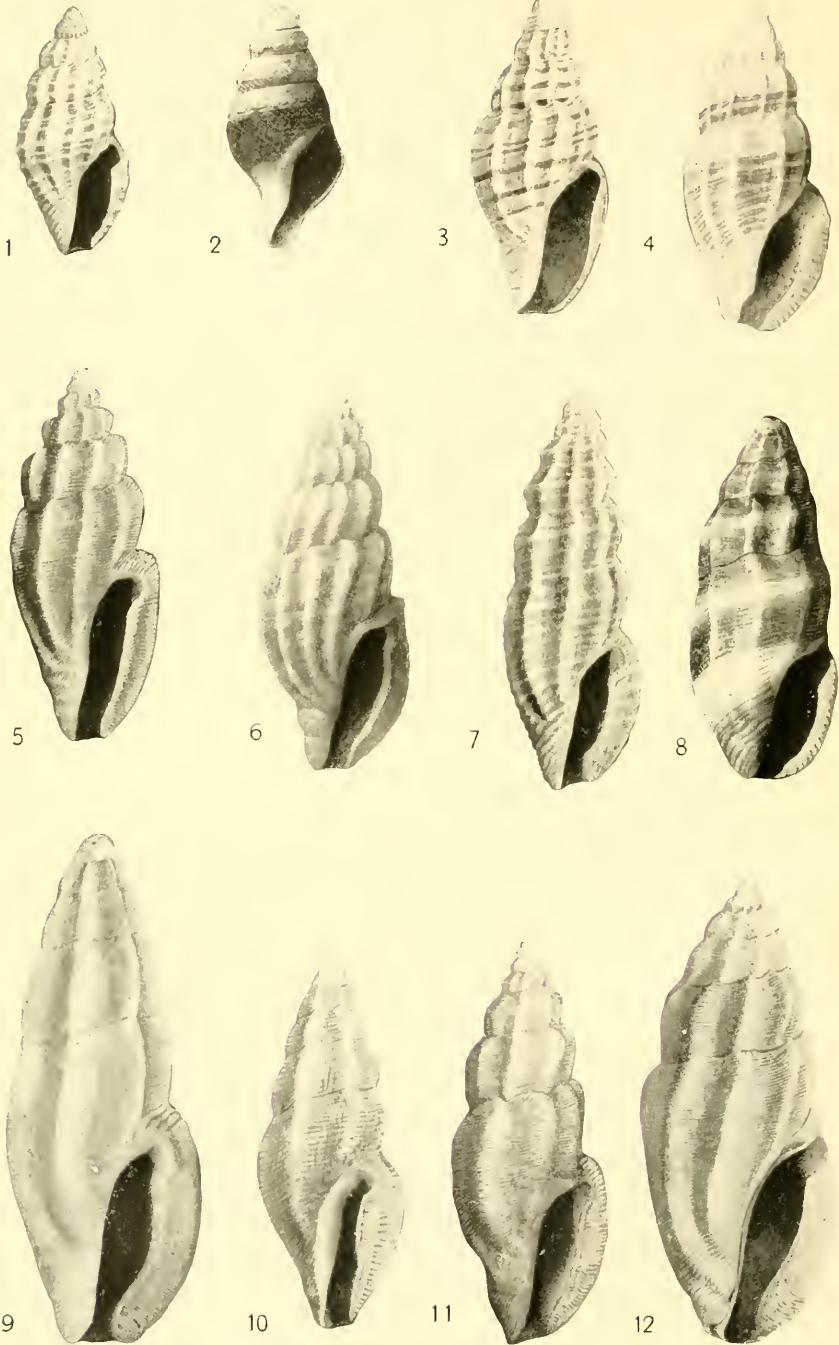
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NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 86



NEW WEST COAST MOLLUSKS OF THE FAMILY TURRITIDAE

FOR EXPLANATION OF PLATE SEE PAGE 86