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No. 35

NEW SPECIES OF RECENT MOLLUSKS FROM THE
COAST OF WESTERN NORTH AMERICA

BY

A. M. STRONG

AND

LEO GEORGE HERTLEIN

*Assistant Curator, Department of Paleontology,
California Academy of Sciences*

The Templeton Crocker Expedition to the Galapagos Islands in 1932 secured a large collection of marine mollusks. Many of the species represented in that assemblage are comparatively rare in conchological collections. Two papers¹ dealing with portions of this valuable collection have already appeared and the present one contains descriptions of nineteen species which appear to be new to science.

The writers wish to express their thanks to Mr. Templeton Crocker whose generosity has made this paper possible. Gratitude is also due to Dr. G. D. Hanna, Curator of the Department of Paleontology of the California Academy of Sciences, for helpful suggestions and criticism of the manuscript, and for the drawings of the new species of *Pleurodon*. Acknowledgment is also made to Mr. Frank L. Rogers, who has prepared the photographs. These photographs are the result of work accomplished as a part of a Government Works Progress Administration project.

¹ A. M. Strong, G. D. Hanna, and L. G. Hertlein. Marine Mollusca from Acapulco, Mexico, with notes on other species. Proc. Calif. Acad. Sci., 4th ser., vol. 21, no. 10, Dec. 21, 1933, pp. 117-130, plates 5 and 6.

L. G. Hertlein. The Recent Pectinidae. Proc. Calif. Acad. Sci., 4th ser., vol. 21, no. 25, Sept. 26, 1935, pp. 301-328, plates 18 and 19.

Nuculana lucasana Strong and Hertlein, new species

Plate 34, figures 9, 12, 13

Shell small, olivaceous, swollen, fairly thick with the beaks a little nearer the anterior end; anterior end evenly rounded, with a shallow, radial depression extending from the beaks to the basal margin; posterior end narrowed by the broad, depressed dorsal area, the end rounded, without rostration; basal margin evenly rounded; posterior dorsal area concave near the beaks, the edge raised, giving the appearance of an escutcheon, but not bounded by either angle or rib; entire surface sculptured with close, uninterrupted, raised, concentric threads; inside white, polished; hinge with strong, projecting teeth, of which there are fourteen on the posterior and sixteen on the anterior side of the small ligamental pit. The type measures: length, 11.8 mm., height, 8.0 mm., diameter, 6.8 mm.

Holotype: No. 6966, and *paratype*: No. 6967, Calif. Acad. Sci., Paleo. Type Coll., from Loc. 27,584 (C.A.S.), Lat. 23° 03' to 23° 06' N., Long. 109° 36' to 109° 31' W., dredged about 10 miles due east of San Jose del Cabo, Lower California, Mexico, in 20 to 220 fathoms, Templeton Crocker Expedition, August 5, 1932. One hundred and seventy-five additional specimens were dredged at the same locality.

In many ways this shell conforms to the description of the unfigured *Leda* (*Jupiteria*) *lobula* Dall², dredged off Acapulco in 141 fathoms. Of this Dall states: "It is remarkable for its oval shape, which, if characteristic of the fully adult, would hardly allow it to be a member of this section of the genus." Dall's type measured: length 4.7 mm., alt., 3.2 mm., diam., 1.5 mm. Our shell is much larger, with the diameter nearly as great as the height. Also in Dall's description no mention is made of the anterior radial depression, which is present in many, although not in all species in the genus. Our shell is not typical of any subdivision of *Nuculana* recorded from the west coast of North America, the shape being more like that of some species of *Tindaria*. However the hinge seems to be that of *Nuculana*.

Modiolus eiseni Strong and Hertlein, new species

Plate 34, figures 11, 14, 15, 16

Shell thin, elongate, inflated, smooth; hinge line oblique, long, straight, with the beaks at about one third the distance from the anterior end; beaks hooked, rising above the hinge line; dorsal margin nearly straight, meeting the hinge line at a distinct angle and forming a wing-like projection; ventral margin slightly concave near the middle with a small byssal gape; extremities rounded; interior iridescent. The shell is covered with a thin, polished epidermis, colored in three zones radiating from the beaks; the dorsal half of the shell, extending to the bulging portion along a line from the beaks to the posterior end of the ventral margin, is claret brown of Ridgway; the anterior third extending to a line from the beaks to the middle of the

² Bull. Mus. Comp. Zool., vol. 43, no. 6, 1908, p. 375. U.S.S. Albatross station 3422, in 141 fathoms, mud, off Acapulco, Mexico, bottom temperature 53.5°.

ventral margin is raw umber; between these two zones is a narrow whitish band. The posterior portion of the shell is somewhat hirsute, holding a thin layer of sand grains. The type measures: length, 29 mm., height, 13 mm., maximum diameter of the two valves, 12 mm.

Holotype: No. 6968, Calif. Acad. Sci., Paleo. Type Coll., from Loc. 27,583 (C.A.S.), Lat. $22^{\circ} 44' N.$, Long. $105^{\circ} 59' W.$, **about 38 miles southeast of Mazatlan, Sinaloa, Mexico**, and about 8 miles offshore, in 10 to 17 fathoms, Templeton Crocker Expedition, July 29, 1932.

A second specimen was dredged at the same locality, and another at Loc. 27,584 (C.A.S.), Lat. $23^{\circ} 03'$ to $23^{\circ} 06' N.$, Long. $109^{\circ} 31'$ to $109^{\circ} 36' W.$, in 20 to 220 fathoms, about 10 miles due east of San Jose del Cabo, Lower California, Mexico.

The most striking characters of this species are the wing-like expansion of the dorsal margin and the brilliant color pattern, which easily distinguish it from such species as *Modiolus rectus* Conrad, or any other species described from western North America.

This species is named for Dr. Gustav Eisen, long a member of the California Academy of Sciences, in recognition of his pioneer zoological work in the southern part of Lower California.

***Cardium (Papyridea) crockeri* Strong and Hertlein, new species**

Plate 34, figures 1, 2, 7, 10

Shell ovate, a little longer than high, beaks nearly central; posterior gape distinct; anterior dorsal margin with a narrow depressed area; sculptured with forty-eight low, flattened, radiating ribs with much narrower interspaces, strongest at the posterior end, becoming narrower toward the anterior end; of these ribs twelve on the posterior end and eighteen on the anterior end are imbricated by small, pointed folds, more or less worn off toward the beaks, central ribs smooth; exterior yellowish white with short patches of red arranged in irregular concentric zones on the ribs; interior white, stained with reddish toward the beaks on the anterior side; margins crenulated; ligament external, strong, short; hinge with one cardinal and two laterals in each valve. The type measures: length, 46.8 mm., height, 41 mm., thickness of the two valves, 29 mm.

Holotype: No. 6969, Calif. Acad. Sci., Paleo. Type Coll., from Loc. 27,588 (C.A.S.), dredged in Lat. $24^{\circ} 14'$ to $24^{\circ} 18' N.$, Long. $111^{\circ} 28'$ to $111^{\circ} 29' W.$, **about 13 miles southeast of Cabo Tosco, Santa Margarita Island, Lower California, Mexico**, Templeton Crocker Expedition, August 8, 1932. A second but much smaller specimen was also dredged at the type locality.

The species differs from *Cardium (Papyridea) aspersum* Sowerby, in possessing a more convex shell, which has a more rounded outline and it is ornamented by brighter colors. The anterior plate on the hinge, which bears a groove and lateral tooth, is longer than the corresponding plate in *Cardium aspersum*.

This species is dedicated to Mr. Templeton Crocker, the enthusiastic leader of the expedition.

***Pleurodon subdolus* Strong and Hertlein, new species**

Plate 35, figures 14, 18, 19

Shell minute, obliquely ovate, smooth, white, translucent; beaks prominent, hinge line short, straight, forming a small, flaring projection at each end; hinge plate broad, continued as a shelf along more than half of the posterior side of each valve, the inner margin turned up and, in the left valve, ending in a lateral tooth; cardinal teeth small, indistinct, divided into a posterior and anterior series, three or four in each, which meet at an angle, those in the posterior series being larger and wider spaced. The type measures: length, 1.85 mm., height, 2.5 mm.

Holotype: No. 6970, and *paratypes*: Nos. 6971 and 6972, Calif. Acad. Sci., Paleo. Type Coll., from Loc. 27,584A (C.A.S.), Lat. 23° 12' N., Long. 106° 29' W., dredged in 12 fathoms, about five miles west of Mazatlan, Sinaloa, Mexico, Templeton Crocker Expedition, August 2, 1932. Three additional valves were dredged at the same locality.

Pleurodon munitum Carpenter³, of which *Nucula petriola* Dall⁴ is a synonym, is the only West Coast species previously placed in this genus. It is a more regularly oval shell with a very persistent, dark epidermis, and the hinge plate is quite different. The hinge of the present species is very similar to that of *Pleurodon adamsi* Dall⁵, from the Straits of Florida, but the West American shell is considerably narrower in proportion to the length.

***Cuspidaria lanieri* Strong and Hertlein, new species**

Plate 34, figure 8

Shell minute, plump, white, with a pale epidermis, the left valve a little the smaller, beaks a little nearer the anterior end; the anterior end rounded; the posterior end produced, compressed, strongly rostrate, truncate; sculptured with radiating ribs of which the one defining the beginning of the rostration and a second some distance anterior to it are strongly raised and project a short distance beyond the margin of the shell; these are followed anteriorly by ten smaller, closer spaced ribs with some indications of intercalary threads; on the rostrum there are four closely spaced radial threads near the dorsal margin; entire surface with microscopic lines of growth, most prominent near the end of the rostrum. The type measures: length, 4.5 mm., height, 2.9 mm., diameter, 1.2 mm.

³ *Cyrrilla munita* Carpenter, Dall, Trans. Wagner Free Inst. Sci., vol. 3, pt. 4, 1898, p. 602. "from thirty fathoms off Catalina Island, California." — Dall, U. S. Nat. Mus., Bull. 112, 1921, p. 14. "Santa Barbara Islands, to Gulf of California." — I. S. Oldroyd, Stanford Univ. Publ. Univ. Ser., Geol. Sci., vol. 1, no. 1, 1924, p. 36 (as *Pleurodon munitum*), Dall's range cited.

⁴ *Nucula petriola* Dall, Proc. U. S. Nat. Mus., vol. 52, 1916, p. 395. "off Santa Rosa Island, California, in 53 fathoms, mud."

⁵ Trans. Wagner Free Inst. Sci., vol. 3, pt. 4, 1898, p. 601, pl. 24, fig. 9. "Dredged seven miles east of Fowey Rocks, Straits of Florida."

Holotype: No. 6973, and *paratype*: No. 6974, Calif. Acad. Sci., Paleo. Type Coll., from Loc. 27,584 (C.A.S.), Lat. $23^{\circ} 03'$ to $23^{\circ} 06'$ N., Long. $109^{\circ} 31'$ to $109^{\circ} 36'$ W., dredged in 20 to 220 fathoms, about 10 miles due east of San Jose del Cabo, Lower California, Mexico, Templeton Crocker Expedition, August 5, 1932. Sixteen additional valves were dredged in the same locality.

The outline of this shell is quite similar to that of *Cuspidaria dulcis* Pilsbry & Lowe,⁶ represented in the Academy collection by specimens from the Tres Marias Islands. The present species is smaller, with more numerous ribs and lacks the twinning of the ribs on the left valve. Except for the *Albatross* dredging at great depths, records of species of this genus in west coast tropical waters are very few. Two species, *Cuspidaria costata* Sowerby⁷ and *Cuspidaria didyma* Hinds,⁸ have been described from Central America. Neither have been recognized in the Academy collection, nor in the extensive collection made by H. N. Lowe. The descriptions of both are so brief that positive identification of the species would be difficult. The sculpture of the present species is so striking that it would hardly seem possible to refer it to either of them.

This species is named for Mr. Robert J. Lanier, Assistant Superintendent of the Steinhart Aquarium of the California Academy of Sciences. He accompanied the Templeton Crocker Expedition to the Galapagos Islands and assisted in the collecting of many marine mollusks.

Poromya trosti Strong and Hertlein, new species

Plate 34, figures 3, 4, 5, 6

Shell small, rounded, thin, plump, smooth except for lines of growth; covered with a thin, yellowish brown epidermis, lighter toward the prominent umbones; both valves having a narrow, posterior area defined by a shallow, radial groove; interior pearly, hinge with a strong, rounded projecting cardinal tooth in one valve, fitting into a notch in the opposite valve; and a small, oblique, internal ligament and resilium set just behind the beaks. The type measures: length, 15.0 mm., height, 12.0 mm., thickness of the two valves, 8.7 mm.

Holotype: No. 6975, and *paratype*: No. 6976, Calif. Acad. Sci., Paleo. Type Coll., from Loc. 27,602 (C.A.S.), dredged in 40 to 60 fathoms, Cortes Bank, about 40 miles southwest of San Clemente Island, California, Templeton Crocker Expedition, August 24, 1932.

⁶ *Cuspidaria* (*Cardiomya*) *dulcis* Pilsbry and Lowe, Proc. Acad. Nat. Sci., Philadelphia, vol. 84, 1932, p. 104, pl. 17, figs. 20, 21, 22. "Acapulco, in about 20 fathoms." "Also San Juan del Sur, Nicaragua."

⁷ *Anatina costata* Sowerby, Proc. Zool. Soc. London, 1834, p. 87. "*Hab.* ad Sanctam Elenam." In sandy mud at a depth of six fathoms.

⁸ *Neaera didyma* Hinds, Zool. Voy. Sulphur, Moll., pt. 3, January, 1845, p. 70, pl. 20, fig. 19. "The West Coast of Veragua, in twenty-six fathoms, mud; in society with *N. costata*."

This species is easily separated from *Poromya tenuiconcha* Dall and other California species of the genus *Poromya* by the posterior radial groove.

This species is named for Mr. Henry Trost of the De Young Memorial Museum, San Francisco, California.

***Volvulella panamica* Dall**

Plate 35, figure 3

Volvulella panamica DALL, Proc. U. S. Nat. Mus., vol. 56, 1919, p. 298. "Panama Bay at station 2799, in 29½ fathoms, U. S. Fish Commission."

Fifteen specimens, dredged at Loc. 27,584A (C.A.S.), Lat. 23° 12' N., Long. 106° 29' W., Templeton Crocker Expedition, 1932, are referred to this species. The Academy also has specimens dredged in from 3 to 9 fathoms by L. G. Hertlein at Taboga Island, Panama, in 1932, which appear to be the same.

Dr. Dall states in his description "aperture very narrow with an apical sulcus." The specimens have the posterior end of the aperture somewhat flaring, not extending along the side of the spire as it does in other west coast species. This may be what Dall meant by an "apical sulcus." On this basis this identification is made, and the description of the new species, *Volvulella lowei* is published with some hesitation. For many years *Volvulella cylindrica* Carpenter, 1865,⁹ type locality Santa Barbara, California, was the only species in the genus recognized from the West Coast.

Dall in 1919¹⁰ added five new species, two from southern California, and three from the Bay of Panama, dredged in depths ranging up to 60 fathoms. The types of none of these have been figured, and there are but slight differences indicated by the descriptions. With the exception of the statement by Dall¹¹ that the range of *V. cylindrica* Carpenter is from Vancouver to the Gulf of California and a citation by Lowe¹² of *V. californica* Dall from Punta Penasco in the Gulf of California, there is no published record for any species in the genus between Scammon Lagoon, Lower California, and the Bay of Panama.

***Volvulella lowei* Strong and Hertlein, new species**

Plate 35, figure 2

Shell minute, pale brown, subcylindrical, involved, with a short apical point; smooth, except for twelve fine spiral grooves on the anterior and eight on the posterior end, showing as darker brown spiral lines on the fresh specimen; aperture the

⁹ Ann. Mag. Nat. Hist., ser. 3, vol. 15, 1865, p. 179. "Sta. Barbara (Jewett)."

¹⁰ Proc. U. S. Nat. Mus., vol. 56, 1919, pp. 297 to 299. The following are described as new by Dall in this publication: *Volvulella cooperi*, from Scammon Lagoon, Lower California; *V. californica*, off Santa Rosa Island, California; *V. panamica*, Panama Bay; *V. catharia*, Panama Bay; *V. callicera*, Galapagos Islands.

¹¹ U. S. Nat. Mus., Bull. 112, 1921, p. 62.

¹² Trans. San Diego Soc. Nat. Hist., vol. 8, no. 6, 1935, p. 29.

full length of the shell, very narrow, the posterior end forming a groove in the spine, the outer lip thin, parallel to the body of the shell, broadly rounding into the columella at the anterior end; columella oblique, nearly straight, slightly raised, leaving a shallow umbilical groove; body with a thin callus. The type measures: length, 4.2 mm., maximum diameter, 1.5 mm.

Holotype: No. 6978, Calif. Acad. Sci., Paleo. Type Coll., from Loc. 23,805 (C.A.S.), **Puerto Escondido, Gulf of California**. Fred Baker Collector, Expedition of the California Academy of Sciences to the Gulf of California, 1921. One additional specimen was collected at the same locality. Additional specimens were dredged in from three to nine fathoms at Bahia Honda, Veragua, Panama, by L. G. Hertlein in 1932. Also dredged at Loc. 27,584A (C.A.S.), Lat. $23^{\circ} 12' N.$, Long. $106^{\circ} 29' W.$, about five miles off Mazatlan, Sinaloa, Mexico, Templeton Crocker Expedition, 1932.

Except for the type these specimens are all bleached a dull white and show the spiral grooves without the color lines. In the type the apical spine is broken, while many of the other specimens have an elevated spine, in some cases distinctly curved. The species differs from southern California specimens of *Volvulella cylindrica* Carpenter in the more slender form, and in having the spiral grooves more distinctly grouped at the posterior and anterior ends. All other West Coast species are said to be smooth or with microscopic spiral striae only.

This species is named for the late Mr. Herbert N. Lowe, of Long Beach, California, in recognition of his contributions to the knowledge of the conchology of western North America.

Fusinus zacae Strong and Hertlein, new species

Plate 35, figure 10

Shell slender, fusiform, with a long, slightly twisted canal, dark brown, lighter on the interspaces between the axial ribs of the lower whorls, base and canal reddish brown; nuclear whorls smooth, followed by eight strongly sculptured whorls, angulated in the middle; sutures strongly appressed; axial sculpture of eight, rounded ribs, strong over the middle of the whorls, fading out toward the summit of the whorls and on the base; entire surface with wavy lines of growth; spiral sculpture of six cords, faint in the interspaces, strong over the axial ribs where they form narrow, spirally elongated nodes; of these cords the one on the angle of the whorls is the strongest, while the two between the angle and the summit and the three between the angle and the suture become progressively weaker; base and canal with about fifteen, faint, spiral threads; outer lip thin; columella smooth. The type measures: length, 52 mm., length of aperture and canal, 25 mm., maximum diameter, 20 mm.

Holotype: No. 6979, Calif. Acad. Sci., Paleo. Type Coll., dredged in 20-220 fathoms at Loc. 27,584 (C.A.S.), Lat. $23^{\circ} 03'$ to $23^{\circ} 06'$ N., Long. $109^{\circ} 31'$ to $109^{\circ} 36'$ W., **about 10 miles due east of San Jose del Cabo, Lower California, Mexico**, Templeton Crocker Expedition, 1932.

In some ways this species agrees with the description of the unfigured *Fusinus centrifugus* Dall¹⁸ from the Galapagos, but the surface of our west Mexican species can hardly be said to be sculptured with "elevated lamellae," or the spiral cords to form "spade shaped spines" where they cross the axial ribs.

This species is named for Mr. Templeton Crocker's yacht *Zaca*.

***Nassarius gallegosi* Strong and Hertlein, new species**

Plate 35, figure 11

Shell short, conic, pale brown, darker on the back of the body whorl; nucleus of three, smooth, polished, rounded whorls; subsequent sculptured whorls seven, well rounded, sutures distinct; axial sculpture of seventeen, low, rounded ribs, strongest on the spire, fading out on the base; spiral sculpture of narrow cords which are somewhat swollen when they cross the axial ribs, of these, three at the summit are closely spaced, followed by three, somewhat stronger and wider spaces and two fine, closely spaced threads at the suture; base with eight, moderately strong, spiral cords; outer lip with a strong varix, inside with faint ridges corresponding to the external sculpture; body with a whitish callous, overriding but not obscuring the spiral sculpture, and a strong spiral ridge near the middle; columella broad, reflexed, terminating in a strong keel; canal short, strongly recurved, with a rather broad, spirally threaded, siphonal fasciole, separated from the base of the body whorl by a deep groove. The type measures: length, 21.5 mm., maximum diameter, 13.5 mm.

Holotype: No. 6980, Calif. Acad. Sci. Paleo. Type Coll., from Loc. 27,574 (C.A.S.), Lat. 18° 33' N., Long. 103° 45' W., dredged in 52 fathoms, near **Manzanillo, Colima, Mexico**, Templeton Crocker Expedition, 1932. One hundred and eighty-two additional specimens were dredged at the same locality.

Specimens were also secured by the Templeton Crocker Expedition at the following localities:

Loc. 27,557 (C.A.S.), between Punta Arenas and Bat Island, Costa Rica, Templeton Crocker Expedition, July 1, 1932.

Loc. 27,566 (C.A.S.), Lat. 14° 15' N., Long. 92° 28' W., dredged in 35 fathoms, about 28 miles west of Champerico, Guatemala, Templeton Crocker Expedition, July 11, 1932.

Loc. 27,569 (C.A.S.), Lat. 15° 40' N., Long. 93° 49' W., dredged in 28 fathoms, about 15 miles south of La Puerta Light, Gulf of Tehuantepec, Templeton Crocker Expedition, July 12, 1932. H. W. Clark Coll.

Loc. 27,568 (C.A.S.), Lat. 14° 52' N., Long. 93° 04' W., dredged in 35 fathoms, about 23 miles west of San Simon Bar, Chiapas, Mexico, Templeton Crocker Expedition, July 11, 1932. H. W. Clark Coll.

Loc. 27,571 (C.A.S.), Lat. 16° 38' N., Long. 99° 27' 30" W., to Lat. 16° 39' N., Long. 99° 24' 30" W., dredged in 20 to 45 fathoms,

¹⁸ Nautilus, vol. 29, no. 5, 1915, p. 56. "at the Galapagos Island in 33 fathoms, sandy bottom."

33 miles eastward of Acapulco, Guerrero, Mexico and about 32 miles west of Dulce Bay, Templeton Crocker Expedition, July 15, 1932.

Loc. 27,527 (C.A.S.), dredged in Acapulco Bay,¹⁴ Guerrero, Mexico, Templeton Crocker Expedition, April 4, 1932.

Loc. 27,573 (C.A.S.), Lat. 18° 14' N., Long. 103° 23' W., dredged in 60 fathoms, just off shore at Maruata, and about nine miles southeast of Pt. Telmo, and about 74 miles southeast of Manzanillo, Colima, Mexico, Templeton Crocker Expedition, July 17, 1932.

Loc. 27,580 (C.A.S.), dredged one half mile east of Isabel Island, Templeton Crocker Expedition.

Loc. 27,581 (C.A.S.), dredged between Isabel Island and Mazatlan, Sinaloa, Mexico, Templeton Crocker Expedition, July 28, 1932.

Loc. 27,594 (C.A.S.), Santa Maria Bay, Lower California, dredged in 10 to 16 fathoms, Templeton Crocker Expedition.

This species belongs to an off shore group of *Nassarius* containing *N. insculptus* (Carpenter)¹⁵ of southern California coast, *N. miser* Dall,¹⁶ stated to range from Acapulco to the Gulf of Panama in from 141 to 322 fathoms, and *N. catallus* Dall,¹⁷ reported only from the Gulf of Panama, in 182 fathoms. In the large series of specimens examined there is some difference in the relative strength of the axial and spiral sculpture, but the species seems to be entirely distinct from any described form. It is probably nearest to *N. catallus*, from which it differs principally in the larger size and finer sculpture.

This species is named for Professor José Maria Gallegos, formerly Explorer for the Departamento de Agricultura y Fomento, Mexico.

Mitrella harfordi Strong and Hertlein, new species

Plate 35, figure 15

Shell very small, solid, whitish, with a central band of large, irregular, brown blotches on the body whorl and distant, brown, axial markings on the upper whorls; whorls eight, including a small, undifferentiated nucleus; sutures distinct, narrowly channeled; surface smooth except for twelve strong, spiral grooves on the base and canal; aperture narrow, with a well defined hump just back of its thick outer lip, distinctly sinuated, the sinus bounded internally by a denticle, below which are five indistinct, spiral ridges; body with a thin callus; columella thickened; slightly grooved in accordance with the spiral sculpture; canal short. The type measures: length, 3.4 mm., maximum diameter, 1.8 mm.

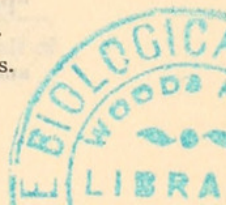
Holotype: No. 6981, Calif. Acad. Sci. Paleo. Type Coll., from Loc. 27,571 (C.A.S.), Lat. 16° 38' N., Long. 99° 27' 30" W., to Lat. 16° 39' N., Long. 99° 24' 30" W., dredged in 20 to 45 fathoms, about 33 miles eastward of Acapulco, Guerrero, Mexico, and 32

¹⁴ This species was listed from this locality as *Nassarius miser* Dall, in Proc. Calif. Acad. Sci., ser. 4, vol. 21, no. 10, 1933, p. 119.

¹⁵ Proc. Calif. Acad. Sci., vol. 3, 1864, p. 223. "Catalina Island, 30-40 fm."

¹⁶ Bull. Mus. Comp. Zool., vol. 43, no. 6, 1908, p. 307, pl. 4, fig. 1. Gulf of Panama, in 182 fathoms.

¹⁷ Bull. Mus. Comp. Zool., vol. 43, no. 6, 1908, p. 307, pl. 11, fig. 11. Gulf of Panama, in 182 fathoms.



miles west of Dulce Bay, Templeton Crocker Expedition, July 15, 1932. Fifteen additional specimens were dredged at the same locality. Fourteen specimens of the species were dredged in from three to nine fathoms off Taboga Island, Panama by L. G. Hertlein in 1932.

In many ways this species resembles the northern shell commonly known as *Mitrella gausapata* Gould, but it is much smaller.

The swollen hump on the body whorl, similar to that on many species of *Strombina*, has not been noticed in any other species placed in the genus *Mitrella* from the West Coast, although in all other ways the species conforms to the definition of that genus.

This species is named for Mr. W. G. W. Harford, early Director of the Museum and Curator of Conchology of the California Academy of Sciences.

Anachis sinaloa Strong and Hertlein, new species

Plate 35, figure 6

Shell small, ovate, solid; nuclear whorls three, pale brown, smooth, glassy; subsequent sculptured whorls four, pale, slightly darker on the base and canal; sutures distinct; axial sculpture consisting of twelve strong ribs, extending from suture to suture, fading out on the base; spiral sculpture of incised grooves, strong in the interspaces, but not visible on the top of the axial ribs on the spire, of these grooves there are six on the spire and six on the base where they tend to cut across the feeble extensions of the axial ribs, canal with eight spiral threads; aperture narrow, outer lip thickened, slightly sinuated near the posterior angle, inside with six spirally elongated denticles; columella broad, obliquely truncated anteriorly; body with a distinct callus more or less ridged in accordance with the spiral sculpture; canal short, a little recurved. The type measures: length 4.2 mm., maximum diameter, 1.8 mm.

Holotype: No. 6982, Calif. Acad. Sci., Paleo. Type Coll., from Loc. 27,584A (C.A.S.), Lat. 23° 12' N., Long. 106° 29' W., dredged in 12 fathoms, about 5 miles west of Mazatlan, Sinaloa, Mexico, Templeton Crocker Expedition, August 2, 1932. Twenty-four additional specimens were dredged in the same locality.

The sculpture of this species is similar to that of *Anachis diminuta* (C. B. Adams),¹⁸ which is about the same length but much broader. While none of these specimens contained the animal, some of them look quite fresh. None of them show any indication of the very dark base and canal, which are characteristic of *A. diminuta*. *Anachis rufotincta* Carpenter¹⁹ is also described as having similar sculpture, but has "a deep orange-red stain at the base," and the measurements indicate a smaller and proportionally broader shell.

¹⁸ *Columbella diminuta* C. B. Adams, Ann. Lyceum Nat. Hist., New York, vol. 5, 1852, p. 309. "Panama."

¹⁹ *Anachis rufotincta* Carpenter, Cat. Mazatlan Shells, [1855-]1857 p. 511. "Mazatlan," off Chama and Spondylus.

Anachis guerreroensis Strong and Hertlein, new species

Plate 35, figure 4

Shell small, ovate, solid, nuclear whorls four, smooth, shining, dark brown; subsequent sculptured whorls four, bright brown, with a narrow, paler band on the periphery of the body whorl; sutures distinct; axial sculpture of twelve rounded ribs, extending from suture to suture, fading out on the base; spiral sculpture of incised grooves in the interspaces between the ribs, of these grooves there are seven on the spire between the sutures and fifteen on the base and canal; aperture narrow, outer lip thickened, sinuated near the posterior angle, inside with six spirally elongated denticles; columella broad, obliquely truncated anteriorly, bearing five rounded denticles; body with a strong callus; canal short, a little recurved. The type measures: length, 4.2 mm., diameter, 1.9 mm.

Holotype: No. 6983, Calif. Acad. Sci. Paleo. Type Coll., from Loc. 27,571 (C.A.S.), Lat. 16° 38' N., Long. 99° 27' 30" W., to Lat. 16° 39' N., Long. 99° 24' 30" W., dredged in 20 to 45 fathoms, about 33 miles eastward of Acapulco, Guerrero, Mexico, and about 32 miles west of Dulce Bay, Templeton Crocker Expedition, July 15, 1932. Nine additional specimens were dredged at the same locality.

Anachis guerreroensis belongs to the same group as *Anachis sinaloa* Strong & Hertlein, new species; it differs in the more numerous spiral grooves, and in the distinctly different color pattern.

Strombina bonita Strong and Hertlein, new species

Plate 35, figure 9

Shell slender, with a sharp, pointed spire; whitish, with a few, small, irregular, brown blotches; consisting of two, smooth nuclear and nine, flattish subsequent sculptured whorls; axial sculpture of eighteen, rounded, nearly vertical ribs, which are moderately shouldered at the suture and fade out as they pass over the slightly angulated periphery; spiral sculpture of about sixteen, slender threads on the base and canal, and a few microscopic striations on the spire; aperture oblong, outer lip thin at the edge, thickened a short distance back, with a slight hump on the outside and eleven spiral ridges on the inside; canal short, recurved. The type measures: length, 19 mm., diameter, 7.5 mm.

Holotype: No. 6984, Calif. Acad. Sci. Paleo. Type Coll., from Loc. 27,587 (C.A.S.), dredged in 20 to 25 fathoms off Cape San Lucas, Lower California, Mexico, Templeton Crocker Expedition, August 6, 1932. Two other specimens were dredged at the same locality. One immature specimen was taken at the nearby locality 27,585 (C.A.S.), Lat. 23° 02' N., Long. 109° 32' W., in 25 fathoms, a few miles offshore at Gorda Point, in San Jose del Cabo Bay, Lower California, Templeton Crocker Expedition, August 5, 1932.

This species can best be compared with *Strombina subangularis* Lowe,²¹ of which a number of specimens were dredged by the Tem-

²¹ Trans. San Diego Soc. Nat. Hist., vol. 8, no. 6, 1935, p. 21, pl. 3, fig. 2. "Carmen Island, Gulf of California, dredged in 20 fathoms."

pleton Crocker Expedition at Loc. 27,585 (C.A.S.). It is a smaller shell with more numerous axial ribs, stronger spiral sculpture, less angulated periphery and shorter canal. *Strombina angularis* (Reeve)²² from Panama is figured as a larger shell, with fewer axial ribs and a much more strongly angulated periphery.

***Trophon keepi* Strong and Hertlein, new species**

Plate 35, figure 8

Shell thin, delicate, white; nuclear whorls two, smooth, rounded, tilted; subsequent sculptured whorls seven, with strongly tabulated shoulders; axial sculpture of twelve sharp varices, sharply angulated and more or less spinose at the shoulder, continuous over the entire whorl and extending to the canal, where they become lower and closely crowded; spiral sculpture of close, microscopic striations; outer lip thin, angulated at the shoulder of the whorl; body and columella with a coat of white enamel; canal long, slightly twisted and strongly recurved. The type measures: length, 26.9 mm., length of aperture and canal, 14.5 mm., maximum diameter, including varices, 10 mm.

Holotype: No. 6985, Calif. Acad. Sci. Paleo. Type Coll., from Loc. 27,603 (C.A.S.), dredged in 30 to 50 fathoms off the west end of San Nicolas Island, California, Templeton Crocker Expedition, August 27, 1932.

In outline the single type specimen resembles that of *Trophon tripherrus* Dall,²³ said to range from the Straits of Juan de Fuca to off Piedras Blancas, Lower California. It differs in the much stronger development of the varices and the lack of the spiral cords.

This species is named for Prof. Josiah Keep, conchologist and early member of the California Academy of Sciences.

***Eulimostraca bartschi* Strong and Hertlein, new species**

Plate 35, figure 7

Shell minute, elongate conic, translucent, the internal structure showing through and forming a distinct false suture, pale flesh color, with the base light brown, showing through as a darker line between the true and false sutures on the spire; whorls nine, the first three somewhat rounded, the latter whorls becoming flattened, sutures very indistinct; periphery subangulated, base short, rounded; aperture oval with the posterior angle acute; outer lip somewhat drawn forward in the middle; inner lip curved, raised, with behind it a shallow groove in the umbilical region; body with a thin, well defined callus. The type measures: length, 1.8 mm., maximum diameter, 0.5 mm.

Holotype: No. 6986, Calif. Acad. Sci. Paleo. Type Coll., from Loc. 27,584A (C.A.S.), Lat. 23° 12' N., Long. 106° 29' W., dredged in

²² Conch. Icon., vol. 11, 1859, pl. 1, fig. 1a, 1b.

²³ Proc. U. S. Nat. Mus., vol. 24, 1902, p. 545, dredged "off Destruction Island, State of Washington, in 516 fathoms." Also "off Tillamook Bay, Oregon, in 786 fathoms." — U. S. Nat. Mus., Bull. 112, 1921, pl. 15, figs. 8 and 9.

12 fathoms, **about five miles west of Mazatlan, Sinaloa, Mexico**, Templeton Crocker Expedition, August 2, 1932. Seven additional specimens were secured at the same locality.

This species is very similar to *Eulimostraca galapagensis* Bartsch,²⁴ dredged in 40 fathoms off the Galapagos Islands, the only species previously described in the genus from the West Coast. It differs principally in being much smaller with a less angulated periphery.

This species is named for Dr. Paul Bartsch, Curator of Mollusks in the U. S. National Museum in recognition of his contributions to conchology.

***Epitonium (Nitidiscala) willetti* Strong and Hertlein, new species**

Plate 35, figure 5

Shell small, white, thin, turreted; nuclear whorls four, strongly rounded, elevated, smooth, changing abruptly to the sculpture of the succeeding whorls, of which there are five in the type; normal whorls well rounded, sutures deep; spiral sculpture absent; axial sculpture of eighteen, low, sharp, erect, strongly retractive varices, continuous over the sutures where they make a marked curve to the left as they ascend the spire; at the shoulder of the whorls there is sometimes a slight expansion of the varices but no indication of a spine or coronation; on the base the varices become lower and decidedly curved; aperture nearly circular; lip thin, continuous; shell not umbilicated. The type measures: length, 3.2 mm., maximum diameter, 1.6 mm.

Holotype: No. 6987, *paratypes*: Nos. 6988, 6989, 6990 Calif. Acad. Sci. Paleol. Type Coll., from Loc. 27,584A (C.A.S.), Lat. 23° 12' N., Long. 106° 29' W., **dredged in 12 fathoms, about five miles west of Mazatlan, Sinaloa, Mexico**, Templeton Crocker Expedition, August 2, 1932. Six additional specimens were dredged at the same locality.

The type has lost the first two nuclear whorls but they are intact in the paratypes, which have one or two less normal whorls and in some cases twenty or more varices. These specimens are probably young but are evidently quite distinct from the few west coast species with numerous, close spaced varices. The nearest species would seem to be *Epitonium sawinae* Dall,²⁵ which is more slender, with the varices almost always showing spines at the shoulder of at least some of the whorls.

This species is named for Mr. George Willett, Curator of Ornithology in the Los Angeles County Museum, Los Angeles, California.

²⁴ Proc. U. S. Nat. Mus., vol. 53, 1917, p. 333, pl. 43, fig. 1. "dredged off Galapagos Island, by the United States Bureau of Fisheries Steamer *Albatross*, at station 2813, in 40 fathoms, on coral sand bottom, bottom temperature 80°."

²⁵ *Scala sawinae* Dall, Proc. Biol. Soc. Washington, vol. 16, December 31, 1903, p. 193; "from 16 fathoms, off the isthmus harbor on the south side of Catalina Island, where it was dredged by W. H. Dall, in 1873."
— Strong, Trans. San Diego Soc. Nat. Hist., vol. 4, no. 7, 1930, pp. 194, 195, pl. 20, figs. 9, 10.

***Turbonilla (Pyrgiscus) wetmorei* Strong and Hertlein, new species**

Plate 35, figure 1

Shell minute, elongate conic, semi-translucent horn colored with two, narrow, indistinct, brown, spiral lines on the last two whorls; nuclear whorls large, helicoid, with the axis at right angles to that of the succeeding whorls, in the first of which they are about one third immersed; normal whorls seven, flattened in the middle, on the upper whorls strongly shouldered, less so on the later whorls; sutures distinct; axial sculpture of low, moderately strong, nearly vertical ribs; slightly swollen at the summit of the whorls; of these sixteen appear on the second whorl, increasing to twenty on the last whorl; spiral sculpture of from twelve to sixteen incised lines, varying in number, spacing and strength from whorl to whorl, crossing the rather broad intercostal spaces, but not visible on the tops of the axial ribs; periphery of the last whorl well rounded, base moderately long, rounded, marked by feeble extensions of the axial ribs and six very fine spiral lines; aperture elongate oval, outer lip thin, showing the external sculpture within, body with a thin callus; columella raised, curving into the aperture as an oblique fold. The type measures: length, 3.5 mm., diameter, 0.9 mm.

Holotype: No. 6991, *paratypes*: Nos. 6992, 6993, Calif. Acad. Sci. Paleo. Type Coll., from Loc. 27,584A (C.A.S.), Lat. 23° 12' N., Long. 106° 29' W., dredged in 12 fathoms, about five miles west of Mazatlan, Sinaloa, Mexico, Templeton Crocker Expedition, August 2, 1932. Forty-three additional specimens were secured at the same locality.

Many of the specimens are bleached a dull, chalky white. The species is similar in many ways to *Turbonilla indentata* Carpenter,²⁶ but is more slender and lacks the spiral threads and strong basal sculpture.

This species is named for Dr. Alexander Wetmore, Assistant Secretary, Smithsonian Institution, who on more than one occasion has furnished the writers with needed photographs of certain specimens in the U. S. National Museum.

***Cymatium amictum* Reeve 1844**

Plate 34, figures 17, 18

Reeve stated in his description of the species²⁷ that it came from the Philippine Islands, and the name appears in the Catalogue of Marine Shells of the Philippine Islands by Faustino²⁸ as belonging in that fauna. Our specimens seem to agree with the description and figure in every way. We can find no previous record of this species from the west coast of North America, but several other species in this group have been generally recognized as occurring

²⁶ *Chrysallida indentata* Carpenter, Cat. Mazatlan Shells, [1855-]1857, p. 425. "Mazatlan, Mexico." "off Spondylus."

²⁷ L. Reeve, Conch. Icon., vol. 2, *Triton*, June, 1844, species 62, pl. 15, fig. 62. "Philippine Islands; Cum- ing."

²⁸ *Nyctilochus amictus* Reeve, Faustino, Philippine Bureau of Science, Monogr. 25, 1928, p. 227. "Philip- pines."

on both sides of the Pacific. The west coast specimens are characterized by the long, curved canal, closely reticulated sculpture on the upper whorls, lower whorls shouldered, sculptured with eight rounded axial ribs crossed by alternating major and minor, flattened, spiral cords below the shoulder and finer spiral threads above. The specimen figured measures: length, 48.8 mm., maximum diameter, 24 mm. It was dredged at Loc. 27,568 (C.A.S.), Lat. 14° 52' N., Long, 93° 04' W., in 35 fathoms, about 23 miles west of San Simon Bar, Chiapas, Mexico, Templeton Crocker Expedition, July 11, 1932.

***Colubraria lucasensis* Strong and Hertlein, new species**

Plate 35, figure 17

Shell rather slender, with two and a half, smooth, glassy whorls and eight, subsequent sculptured whorls, each with strong varix; general color brownish, with a few irregular, indistinct, darker spots and streaks, varices showing a lighter central area, darker above and below; sculpture of fine axial riblets (about thirty-six on the last whorl) crossed by equally fine spiral threads, of which six appear on the spire; the intersections forming small rounded nodules; periphery rounded, base short, rounded, sculptured with about 16 spiral threads and fainter extensions of the axial riblets; aperture oval, outer lip thickened by a varix, inside with twelve, small denticles, each with a corresponding brown dot on the edge of the lip; body with a broad, thin wash of callus, and a faint, spiral rib a short distance below the posterior end of the aperture, the callus continuous with the slightly expanded columella; canal short, reflected. The type measures: length, 27 mm., maximum diameter, 10.5 mm.

Holotype: No. 6995, Calif. Acad. Sci. Paleo. Type Coll., from Loc. 27,587 (C.A.S.), dredged in 20 to 25 fathoms off Cape San Lucas, Lower California, Mexico, Templeton Crocker Expedition, August 6, 1932.

The single type specimen resembles the figure of *Triton soverbii* Reeve,²⁹ but is much smaller, with much less expansion of the columellar lip, and does not have "brown excavated lines ranged two and two." The specimen is probably not fully mature and might develop more similar characters with two or three more whorls. However, it is very doubtful whether the name *soverbii* can be used for a west coast shell. Reeve gave the locality as the Galapagos Islands, Cuming Collection, and stated that it is the shell described as *Triton lineatus* Sowerby, 1833³⁰ (not *Triton lineatus* Broderip, 1833³¹), also that the species is well figured by Chemnitz³².

²⁹ *Triton soverbii* Reeve, Conch. Icon., vol. 2, *Triton*, June, 1844, species 65, pl. 16, figs. 65, 65a. "Galapagos Islands, Pacific Ocean (found in sandy mud at a depth of six fathoms); Cuming."

³⁰ *Triton lineatus* Sowerby, Proc. Zool. Soc., London, 1833, p. 72 "Hab." [No locality cited. The species placed in the group of *T. maculosus* Lamarck.]

³¹ *Triton lineatus* Broderip, Proc. Zool. Soc., London, May, 1833, p. 6. "Hab. ad Insulas Galapagos." "Found in coral sand, in six fathoms."

³² Conchyl.-Cab., Bd. 10, 1788, p. 260, Tab. 162, figs. 1552, 1553. "Ostindischen Meeren und bei der Insel St. Maurice."

The localities recorded by Chemnitz were waters of the East Indies and the Island of St. Maurice. Tryon³³ cited the locality records for the species as Galapagos Islands by Cuming; Isle of France, Chemnitz; and the Red Sea by MacAndrew and Tapparone-Canefri. Carpenter³⁴ and Dall³⁵ listed the species from the Galapagos Islands, probably following Reeve as they cited no other localities. Zetek³⁶ cited the species as occurring in the Panamanian Zoogeographic Province. The only other reference to the species from the West Coast that we have noticed is by Stearns,³⁷ who discussed under the name *Tritonium (Colubraria) sowerbyi* Reeve, a fragment consisting of a basal whorl collected at Indefatigable Island, Galapagos Islands, which he compared with *Triton reticulatus* Blainville and *Triton testaceus* Mörch from the Antilles.

Natica colima Strong and Hertlein, new species

Plate 35, figures 12, 13, 16

Shell subglobose, rather thin, umbilicate, spire short, whorls rounded; covered with a very thin, semi-transparent epidermis; nucleus of three, small, smooth, polished whorls; normal whorls three, pale brownish, with two paler, narrow spiral bands, one just below the suture and the other just below the periphery of the body whorl, between these and on the upper portion of the base are faint indications of darker axial stripes, more distinct near the spiral bands, base whitish near the umbilicus; sculpture of fine, close, retractive axial grooves, most prominent just below the sutures on the upper whorls; aperture semi-circular, outer lip thin, showing the color markings within; columella thickened in the middle at the end of a blunt, spiral ridge within the umbilicus; body with a distinct callus ending abruptly at the umbilicus, notching the umbilical opening above the rib; operculum calcareous, white, slightly concave, the outer surface with eight, deep, square grooves. The type measures: height, 21 mm., maximum diameter, 18 mm.

Holotype: No. 6996, Calif. Acad. Sci., Paleo. Type Coll., from Loc. 27,574 (C.A.S.), Lat. 18° 33' N., Long. 103° 45' W., dredged in 52 fathoms, just offshore at Black Head (**Pta. San Juan de Lima**), **about 20 miles northwest of Point Telmo**, and about 47 miles south-east of Manzanillo, **Colima, Mexico**, Templeton Crocker Expedition, July 17, 1932.

The shell is quite similar to that of *Natica scethra* Dall,³⁸ dredged in 153 fathoms, in the Gulf of Panama, U.S.S. *Albatross* Sta. 3391, but the operculum is entirely distinct. In Dall's species the operculum has but two grooves in comparison to eight in the species here described.

³³ Man. Conch., vol. 3, (pt. 9), Dec. 31, 1880, p. 26.

³⁴ Rept. Brit. Assoc. Adv. Sci. for 1856 (issued 1857), pp. 188, 337, 360.

³⁵ Proc. U. S. Nat. Mus., vol. 37, 1909, p. 213.

³⁶ Rev. Nueva, nos. 1 & 2, 1918, p. 49. Panamanian Province.

³⁷ Proc. U. S. Nat. Mus., vol. 16, 1893, p. 393.

³⁸ *Natica (Cochlis) scethra* Dall, Bull. Mus. Comp. Zool., vol. 43, no. 6, 1908, p. 333, pl. 11, fig. 5.

PLATE 34

Fig. 1. *Cardium (Papyridea) crockeri* Strong and Hertlein, new species. Length, 46.8 mm., height, 41 mm., thickness of the two valves, 29 mm. Left valve of holotype, No. 6969, C.A.S. Paleo. type coll., from Loc. 27,588 (C.A.S.), dredged in Lat. $24^{\circ} 14'$ to $24^{\circ} 18' N.$, Long. $111^{\circ} 28'$ to $111^{\circ} 29' W.$, about 13 miles southeast of Cabo Tosco, Santa Margarita Island, Lower California, Mexico, Templeton Crocker Expedition. p. 161.

Fig. 2. *Cardium (Papyridea) crockeri* Strong and Hertlein, new species. Umbonal view of same specimen as illustrated in figure 1. p. 161.

Fig. 3. *Poromya trosti* Strong and Hertlein, new species. Length 12.5 mm., height 10.3 mm. Right valve of paratype, No. 6976, C.A.S. Paleo. type coll., from Loc. 27,602 (C.A.S.), dredged in 40 to 60 fathoms, Cortes Bank, about 40 miles southwest of San Clemente Island, California, Templeton Crocker Expedition. p. 163.

Fig. 4. *Poromya trosti* Strong and Hertlein, new species. Left valve of the specimen illustrated in figure 3. p. 163.

Fig. 5. *Poromya trosti* Strong and Hertlein, new species. Length, 15 mm., height 12 mm., thickness of the two valves, 8.7 mm. Holotype, No. 6975, C.A.S., Paleo. type coll., from the same locality as specimen shown in figure 3. p. 163.

Fig. 6. *Poromya trosti* Strong and Hertlein, new species. Umbonal view of the holotype shown in figure 5. p. 163.

Fig. 7. *Cardium (Papyridea) crockeri* Strong and Hertlein, new species. View of the interior of the right valve of the holotype. p. 161.

Fig. 8. *Cuspidaria lanieri* Strong and Hertlein, new species. Length, 4.5 mm., height, 2.9 mm., diameter of both valves, 1.2 mm. Holotype, No. 6973, C.A.S. Paleo. type coll., from Loc. 27,584 (C.A.S.), Lat. $23^{\circ} 03'$ to $23^{\circ} 06' N.$, Long. $109^{\circ} 31'$ to $109^{\circ} 36' W.$, dredged in 20 to 220 fathoms, about 10 miles due east of San Jose del Cabo, Lower California, Mexico, Templeton Crocker Expedition. p. 162.

Fig. 9. *Nuculana lucasana* Strong and Hertlein, new species. Umbonal view of holotype, No. 6966, C.A.S. Paleo. type coll., from the same locality as the specimen shown in figure 8. p. 160.

Fig. 10. *Cardium (Papyridea) crockeri* Strong and Hertlein, new species. View of the interior of the left valve of the holotype. p. 161.

Fig. 11. *Modiolus eiseni* Strong and Hertlein, new species. Length, 29 mm., height, 13 mm., maximum diameter of the two valves, 12 mm. Holotype, No. 6968, C.A.S. Paleo. type coll., from Loc. 27,583 (C.A.S.), Lat. $22^{\circ} 44' N.$, Long. $105^{\circ} 59' W.$, in 10 to 17 fathoms, about 38 miles southeast of Mazatlan, Sinaloa, Mexico, and about 8 miles offshore, Templeton Crocker Expedition. Umbonal view. p. 160.

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PLATE 34—Concluded

Fig. 12. *Nuculana lucasana* Strong and Hertlein, new species. Length, 11.8 mm., height, 8 mm., diameter of both valves, 6.8 mm. Holotype, No. 6966, C.A.S. Paleo. type coll., from the same locality as the specimen shown in figure 8. p. 160.

Fig. 13. *Nuculana lucasana* Strong and Hertlein, new species. Length, 11 mm., height, 7.3 mm. View of the interior of the right valve of paratype No. 6967, C.A.S. Paleo. type coll., from the same locality as the specimen shown in figure 8. p. 160.

Fig. 14. *Modiolus eiseni* Strong and Hertlein, new species. View of left valve of holotype. p. 160.

Fig. 15. *Modiolus eiseni* Strong and Hertlein, new species. View of the interior of the right valve of the holotype. p. 160.

Fig. 16. *Modiolus eiseni* Strong and Hertlein, new species. View of the interior of the left valve of the holotype. p. 160.

Fig. 17. *Cymatium amictum* Reeve. Length, 48.8 mm., maximum diameter 24 mm. Plesiotype, No. 6994, C.A.S. Paleo. type coll., from Loc. 27,568 (C.A.S.), Lat. 14° 52' N., Long. 93° 04' W., dredged in 35 fathoms, about 23 miles west of San Simon Bar, Chiapas, Mexico, Templeton Crocker Expedition. Apertural view. p. 172.

Fig. 18. *Cymatium amictum* Reeve. Another view of specimen illustrated in figure 17. p. 172.

PLATE 35

Fig. 1. *Turbonilla (Pyrgiscus) wetmorei* Strong and Hertlein, new species. Length, 3.5 mm., diameter, 0.9 mm. Holotype, No. 6991, C.A.S. Paleo. type coll., from Loc. 27,584A (C.A.S.), Lat. 23° 12' N., Long. 106° 29' W., dredged in 12 fathoms, about five miles west of Mazatlan, Sinaloa, Mexico, Templeton Crocker Expedition. p. 172.

Fig. 2. *Volvulella lowei* Strong and Hertlein, new species. Length, 4.2 mm., maximum diameter, 1.5 mm. Holotype, No. 6978, C.A.S. Paleo. type coll., from Loc. 23,805 (C.A.S.), Puerto Escondido, Gulf of California. Fred Baker collector, 1921. Also dredged at Loc. 27,584A (C.A.S.), Lat. 23° 12' N., Long. 106° 29' W., about five miles off Mazatlan, Sinaloa, Mexico, Templeton Crocker Expedition. p. 164.

Fig. 3. *Volvulella panamica* Dall. Length, 3.1 mm., maximum diameter, 1.1 mm. Plesiotype, No. 6977, C.A.S. Paleo. type coll., from the same locality as the specimen shown in figure 1. p. 164.

Fig. 4. *Anachis guerreroensis* Strong and Hertlein, new species. Length, 4.2 mm., maximum diameter, 1.9 mm. Holotype, No. 6983, C.A.S. Paleo. type coll., from Loc. 27,571 (C.A.S.), Lat. 16° 38' N., Long. 99° 27' 30" W., to Lat. 16° 39' N., Long. 99° 24' 30" W., dredged in 20 to 45 fathoms, about 33 miles slightly east of Acapulco, Guerrero, Mexico, and about 32 miles west of Dulce Bay, Templeton Crocker Expedition. p. 169.

Fig. 5. *Epitonium (Nitidiscala) willetti* Strong and Hertlein, new species. Length, 3.2 mm., maximum diameter, 1.6 mm. Holotype, No. 6987, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 1. p. 171.

Fig. 6. *Anachis sinaloa* Strong and Hertlein, new species. Length, 4.2 mm., maximum diameter, 1.8 mm. Holotype, No. 6982, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 1. p. 168.

Fig. 7. *Eulimostraca bartschi* Strong and Hertlein, new species. Length, 1.8 mm., maximum diameter, 0.5 mm. Holotype, No. 6986, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 1. p. 170.

Fig. 8. *Trophon keepi* Strong and Hertlein, new species. Length, 26.9 mm., length of aperture and canal, 14.5 mm., maximum diameter including varices, 10 mm. Holotype, No. 6985, C.A.S. Paleo. type coll., from Loc. 27,603 (C.A.S.), dredged in 30 to 50 fathoms off the west end of San Nicolas Island, California, Templeton Crocker Expedition. p. 170.

Fig. 9. *Strombina bonita* Strong and Hertlein, new species. Length, 19 mm., maximum diameter, 7.5 mm. Holotype, No. 6984, C.A.S. type coll., from Loc. 27,587 (C.A.S.), dredged in 20 to 25 fathoms off Cape San Lucas, Lower California, Mexico, Templeton Crocker Expedition. p. 169.

Fig. 10. *Fusinus zacae* Strong and Hertlein, new species. Length, 52 mm., maximum diameter, 20 mm. Holotype, No. 6979, C.A.S. Paleo. type coll., from Loc. 27,584 (C.A.S.), dredged in 20 to 220 fathoms, about 10 miles due east of San Jose del Cabo, Lower California, Mexico, Lat. 23° 03' to 23° 06' N., Long. 109° 31' to 109° 36' W., Templeton Crocker Expedition. p. 165.

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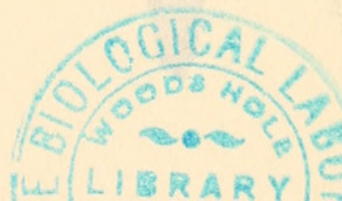


PLATE 35—Concluded

Fig. 11. *Nassarius gallegosi* Strong and Hertlein, new species. Length, 21.5 mm., maximum diameter, 13.5 mm. Holotype, No. 6980, C.A.S. Paleo. type coll., from Loc. 27,574 (C.A.S.), Lat. $18^{\circ} 33' N.$, Long. $103^{\circ} 45' W.$, dredged in 52 fathoms, near Manzanillo, Colima, Mexico, Templeton Crocker Expedition. p. 166.

Fig. 12. *Natica colima* Strong and Hertlein, new species. Height, 21 mm., maximum diameter, 18 mm. Holotype, No. 6996, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 11. p. 174.

Fig. 13. *Natica colima* Strong and Hertlein, new species. View of the exterior of the operculum of the holotype. p. 174.

Fig. 14. *Pleurodon subdolus* Strong and Hertlein, new species. Length, 1.85 mm., height (beak to base), 2.5 mm. Holotype, left valve No. 6970, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 1. p. 162.

Fig. 15. *Mitrella harfordi* Strong and Hertlein, new species. Length, 3.4 mm., maximum diameter, 1.8 mm. Holotype No. 6981, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 4. p. 167.

Fig. 16. *Natica colima* Strong and Hertlein, new species. View of the interior of the operculum of the holotype. p. 174.

Fig. 17. *Colubraria lucasensis* Strong and Hertlein, new species. Length, 27 mm., maximum diameter, 10.5 mm. Holotype, No. 6995, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 9. p. 173.

Fig. 18. *Pleurodon subdolus* Strong and Hertlein, new species. Length, 1.55 mm., height, 2.05 mm. Paratype, left valve, No. 6971, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 1. p. 162.

Fig. 19. *Pleurodon subdolus* Strong and Hertlein, new species. Length, 1.65 mm., height, 2.3 mm. Paratype, right valve, No. 6972, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 1. p. 162.

Fig. 20. *Pleurodon subdolus* Strong and Hertlein, new species. Length, 1.8 mm., height, 2.5 mm. Paratype, left valve, No. 6973, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 1. p. 162.

Fig. 21. *Pleurodon subdolus* Strong and Hertlein, new species. Length, 1.9 mm., height, 2.6 mm. Paratype, right valve, No. 6974, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 1. p. 162.

Fig. 22. *Pleurodon subdolus* Strong and Hertlein, new species. Length, 2.0 mm., height, 2.7 mm. Paratype, left valve, No. 6975, C.A.S. Paleo. type coll., from the same locality as the specimen illustrated in figure 1. p. 162.



Strong, A M and Hertlein, Leo George. 1937. "The Templeton Crocker expedition of the California Academy of Sciences, 1932, No. 35. New species of Recent mollusks from the coast of western North America." *Proceedings of the California Academy of Sciences, 4th series* 22, 159–178.

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