

## MINUTE SHELLS - Part 8

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Before continuing with the family Vitrinellidae, I must correct two errors in Part 7 of MINUTE SHELLS in the April TABULATA (Vol. 7, no. 2). The first error was a simple transposition of captions for Figures 1 and 2. Figure 1 shows five *Truncatella californica* and Figure 2 shows three *Cyclostremella dalli*. I hope those who read the article caught this error from my descriptions. The other error was more serious. The shells shown in Figure 3 of Part 7 which I identified as *Cyclostremella concordia* Bartsch, 1920, I have since learned are actually *Moelleria quadrae* Dall, 1897. They even belong in a different family, the Turbinidae, as indicated by an operculum with spiral ridges and a small hole at the center. Figure 1 of the present article shows another photo which includes two better examples of *Moelleria* shells, both collected by Dr. McLean in Alaska in 1973. *Moelleria quadrae* is shown at the left; *M. costulata* Moller (date not known) at the

right. Figure 2 of this article is the true *Cyclostremella concordia*. This specimen was collected at the type locality of Olga, Washington, and is housed in the Los Angeles County Museum of Natural History. Noticeable differences between this genus and *Moelleria* are the sunken spire; the almost pear-shaped aperture; the hardly visible spiral sculpture of fine lines, covered by a thin ragged periostracum; and the operculum, which is almost smooth, corneous, and paucispiral. Both *Moelleria* species and *C. concordia* are cold water mollusks and the shells are seldom seen in collections, probably because little collecting has been done at the right place to find them. I wish to express my thanks to Dr. McLean for his help in correcting this error.

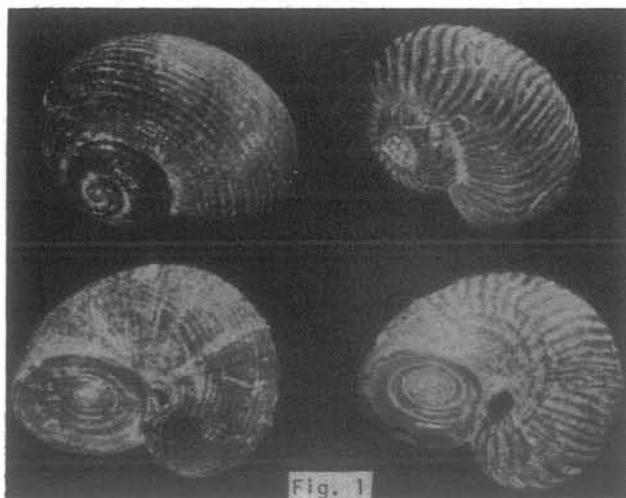


Fig. 1

Left - *Moelleria quadrae* Dall, 1897.  
Right - *Moelleria costulata* Möller. Two views of each shell - LACM 73-23. Dredged off Bochel Island, Alaska. Legit. J. McLean, 1973. Diam. 1.6 mm.

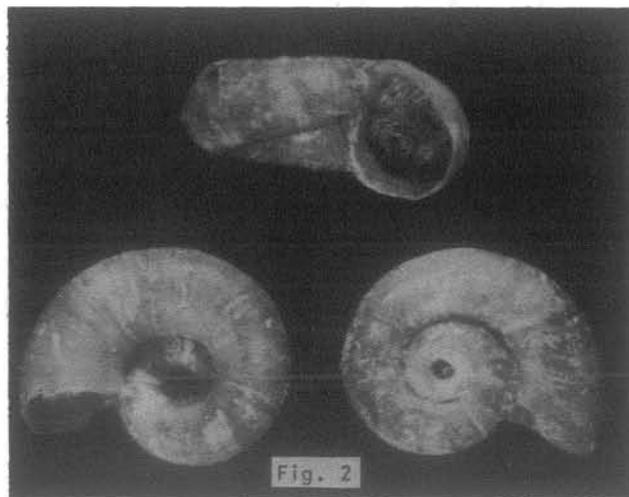


Fig. 2

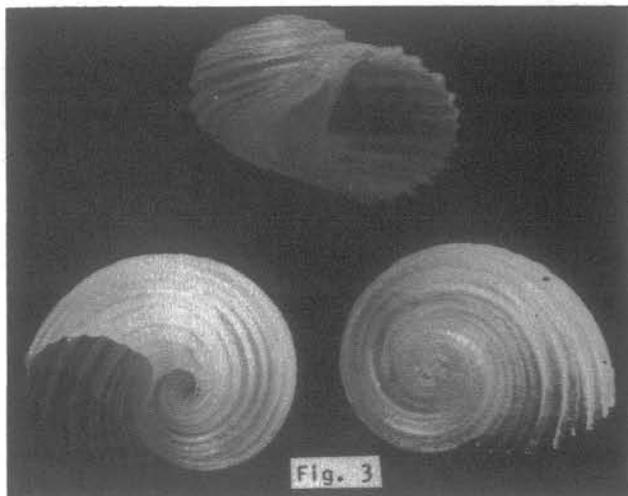
*Cyclostremella concordia* Bartsch, 1920. Olga, Orcus Island, Wash. (ex Stanford Coll.) LACM Coll. Diam. 2.0 mm.

Now to continue with the family Vitrinellidae. The next genus which I will discuss is *Cyclostremiscus* Pils-

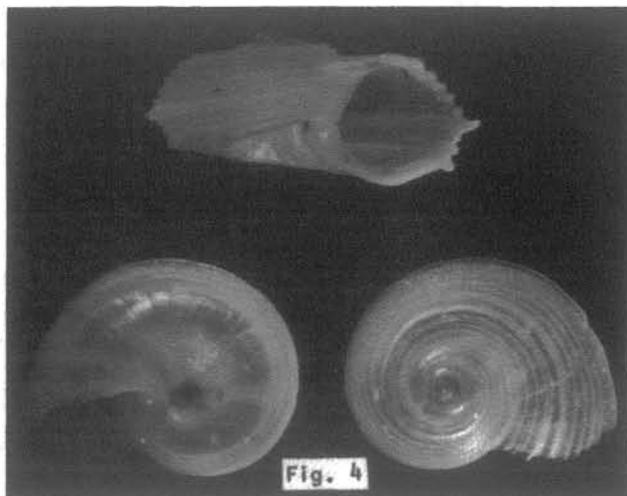
bry & Olsson, 1945. This extensive genus has been divided into three subgenera: *Cyclostremiscus* s.s. with at least 46 species recorded from the eastern Pacific; *Miralabrum* Pilsbry & Olsson, 1945, with two species; and *Pachystremiscus* Olsson & McGinty, 1958, with only one species. All but one species of *Cyclostremiscus* are limited to the subtropical waters as found in the Panamic Province. The one exception is *C. miranda* Bartsch, 1911, named for two specimens reportedly taken at San Pedro, California. To my knowledge there have been no further confirmed findings.

After studying many lots of shells from the genus *Cyclostremiscus* collected throughout the Panamic Province, I have concluded that the various species show remarkably little variation in shell sculpture and size wherever they are found in the 3500 miles of the Province. It would appear helpful, then, to split the many species of the subgenus *Cyclostremiscus* s.s. into three groups, based on similarity of shell characteristics. Then I have selected several of the most typical species from each group to illustrate. Most of the specimens figured were loaned to the author by the Los Angeles County Museum.

The first group consists of those species with strong spiral sculpture in the form of keels or carinae, and little or no axial sculpture other than incremental growth lines. Figures 3 to 6 show four species of this group: *Cyclostremiscus granti* (Baker, Hanna, & Strong, 1938); *C. madreensis* (Baker, Hanna, & Strong, 1938); *C. nummus* Pilsbry & Olsson, 1952; and *C. spiciferi* (Baker, Hanna, & Strong, 1938). The species of this group are relatively large for the genus, 2 to 11 mm in diameter, and range from clear to dull ivory white in color. They generally have 4½ to 5 whorls which expand rather rapidly, resulting in a large aperture, made irregular by extension of the spiral keels. Other species which belong in this group are: *C. bailyi* (Hertlein & Strong, 1951). *C. glyptobasis* Pilsbry & Olsson, 1952; *C.*

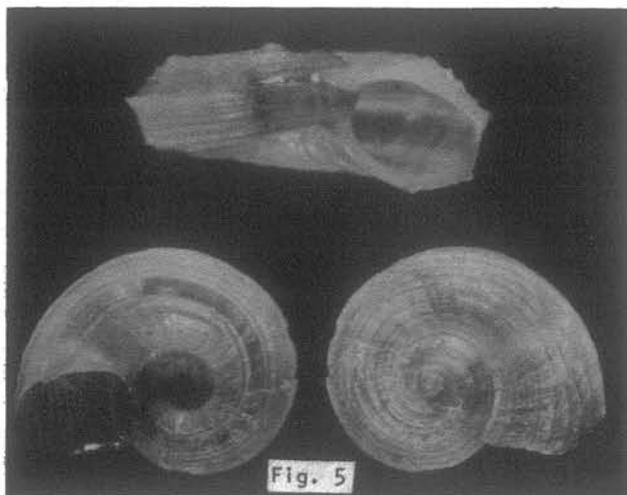


*Cyclostremiscus granti* (Baker, Hanna & Strong, 1938). LACM 66-72. Muertos Bay, Baja Cal., Mex. 10-30 fms. Legit. McLean, Oringer & Marinovich, April 1966. Diam. 4.5 mm.

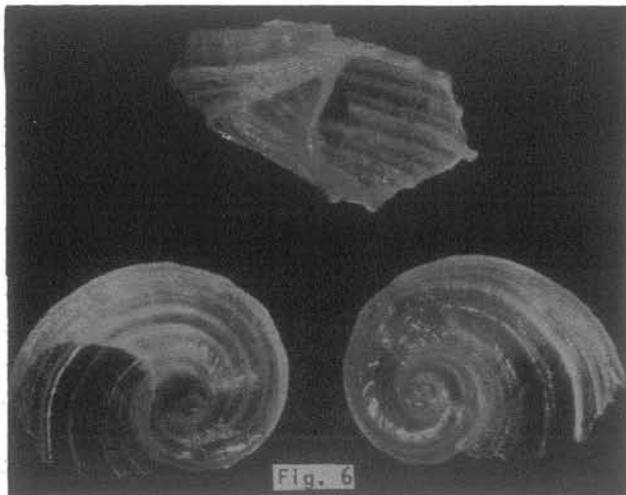


*Cyclostremiscus madreensis* (Baker, Hanna & Strong, 1938). LACM 66-23. Off Punta Ventana, Baja Cal., Mex. Legit. McLean, Oringer & Marinovich. April 1966. Diam. 2.2 mm.

*glyptomphalus* Pilsbry & Olsson, 1952; *C. gordanus* (Hertlein & Strong, 1951); *C. lirulatus* (Carpenter, 1857); *C. planospira* Pilsbry & Olsson, 1945; and *C. major* Olsson & Smith, 1952. *C. major* and *C. gordanus* are the two largest species, reaching 9 to 11 mm in diameter.



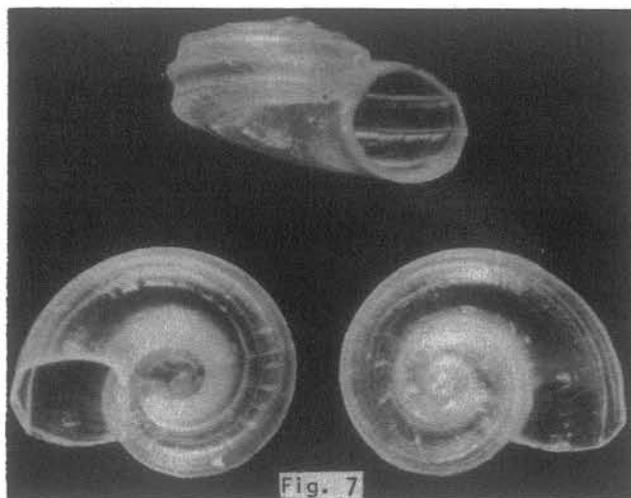
*Cyclostremiscus nummus* Pilsbry & Olsson, 1952. LACM 65-16. 2-5 mi. E. of Pt. Mita, Banderas Bay, Nay., Mex. Legit. J. McLean, March 1965. Diam. 2.4 mm.



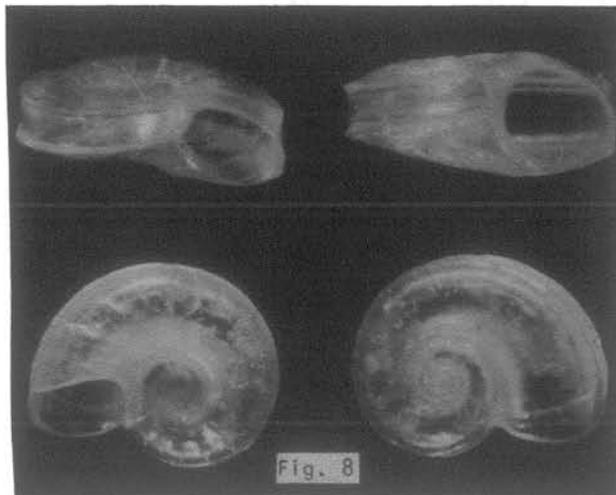
*Cyclostremiscus spiceri* (Baker, Hanna & Strong, 1938). LACM 64-4. 15-40 ft. Guaymas, Mex. Legit. J. McLean, Febr. 1964. Diam. 2.0 mm.

The second group of species in the subgenus *Cyclostremiscus* s.s. have a few spiral keels, of which only one or two are strong; the shells are smaller, rather flat, with low spires. There are sometimes a few axial ribs which are usually curved or oblique, and the shells are quite clear or translucent. I have selected three species to il-

lustrate this group (Figures 7 to 9): *C. bifrontia* (Carpenter, 1857); *C. psix* Pilsbry & Olsson, 1952; and *C. tricarinatus* (C.B. Adams, 1852). These range in size from just over 1 mm for *C. psix* to 3 mm for *C. tricarinatus*. This latter species besides being the largest of the group, also may be unique in having a clear shiny brownish periostracum which adheres quite well in specimens taken live. Other spe-

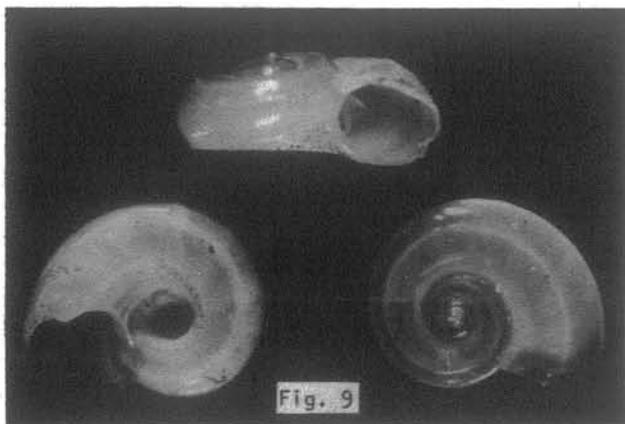


*Cyclostremiscus bifrontia* (Carpenter, 1857). LACM 66-19. 5-20 ft. Pulmo Bay, Baja Cal., Mex. Legit. McLean & Oringer, April 1974. Diam. 1.4 mm.



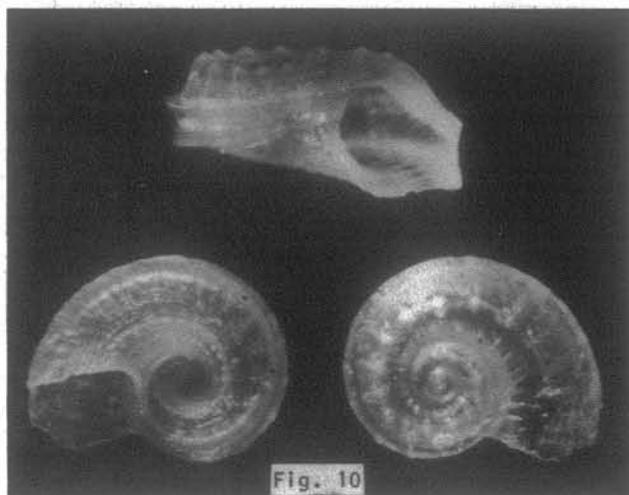
*Cyclostremiscus psix* Pilsbry & Olsson, 1952. Cholla Bay, Puerto Penasco, Son., Mex. Legit. B. Draper, Oct. 1973. Low tide line. Diam. 1.4 mm.

cies which I have placed in this group are: *C. colombianus* Pilsbry & Olsson, 1945; *C. cosmius* (Bartsch, 1907); *C. diomedea* (Bartsch, 1911); *C. gallo* Pilsbry & Olsson, 1945; *C. nodosus* (Carpenter, 1857), *C. pauli* Pilsbry & Olsson, 1952; *C. taigai* (Hertlein & Strong, 1951); and *C. valvatoides* (C. B. Adams, 1852).

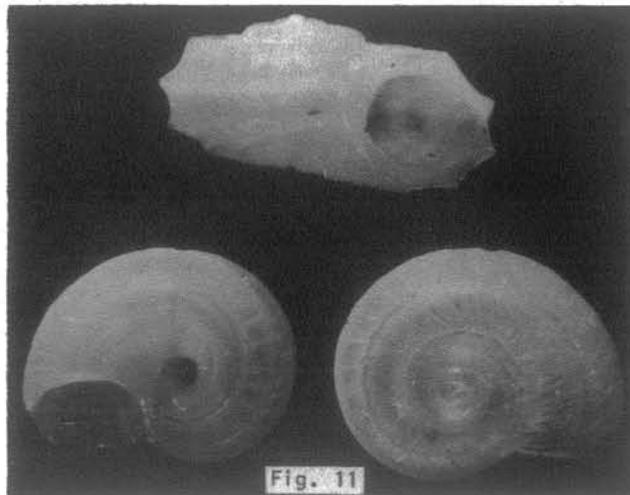


*Cyclostremiscus tricarinatus* (C.B. Adams, 1852). LACM 68-33. Punta San Felipe, Baja Cal., Mex. Legit. D. Cadien, June 1968. Diam. 2.8 mm.

The final group includes the largest number of species. All species in the group are also quite small, ranging from 1 to 2 mm in diameter when adult. The shells generally have a higher spire and the whorls expand less rapidly. The sculpture is strong, both spirally and axially. The axial ribs extend only between each set of spiral keels and often differ from one pair to the next or are missing between some pairs. Usually two or three of the strong spiral keels are located at the periphery of the shell and extend to the aperture giving it an angular shape. Figures 10 to 14 show five species which typify this group quite well and are generally the most commonly found. They are: *Cyclostremiscus coronatus* (Carpenter, 1857); *C. janus* (C. B. Adams, 1852); *C. panamensis* (C. B. Adams, 1852); *C. parvus* (C. B. Adams, 1852); and *C. trigonatus* (Carpenter, 1857). The latter name was selected to replace *C. exigua* (C.

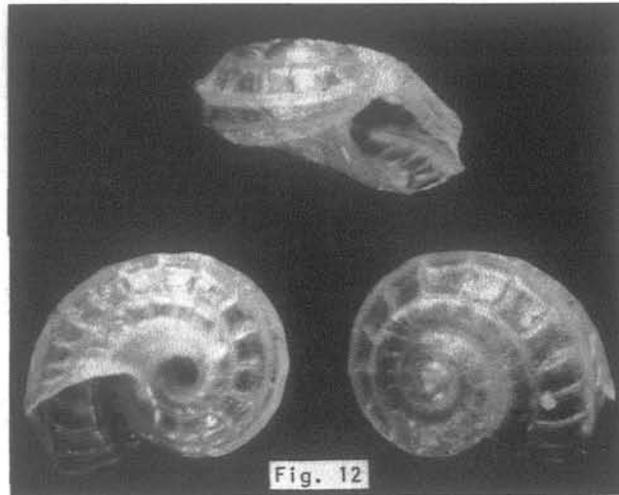


*Cyclostremiscus coronatus* (Carpenter, 1857). LACM 67-6. Bahia Topolobampo, Son., Mex. Legit. C. Snell & B. McMillen, Febr. 1967. Diam. 1.3 mm.

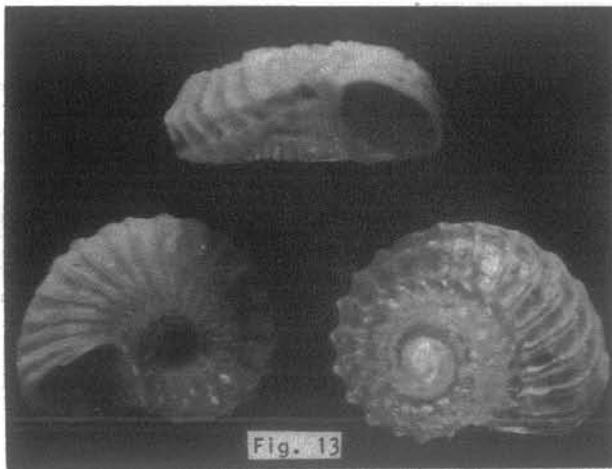


*Cyclostremiscus janus* (C.B. Adams, 1852). LACM 66-13. Cabo San Lucas, Baja Cal., Mex. Legit. McLean & Oringer, April, 1966. Diam. 1.8 mm.

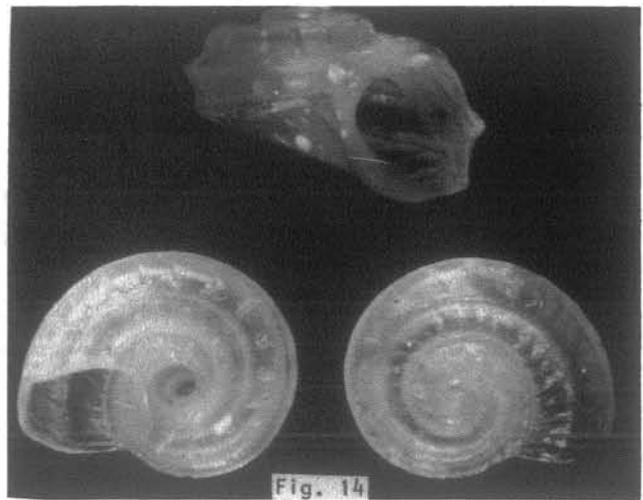
B. Adams, 1852) by Carpenter, when he found *exigua* had already been used for another species in the genus. Several of these species have exceptionally beautiful sculpture when viewed under a 20 power microscope. They range in color from clear to dull white to



*Cyclostremiscus panamensis* (C.B. Adams, 1852).  
LACM 70-9. Salinas, Ecuador. Legit. J. McLean  
March, 1970. Diam. 1.4 mm.

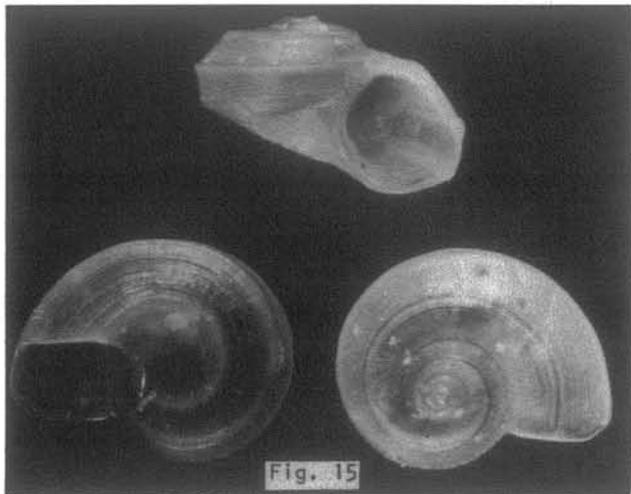


*Cyclostremiscus parvus* (C.B. Adams, 1852). Three  
different shells, B. Draper Coll.  
Edge view - San Carlos Bay, Guaymas, Mex.  
Legit. R. Poorman, 1968.  
Ventral view - Willard Is., B.C., Mex. Legit.  
Chamizal II Exp. Sta. 3, 1969.  
Dorsal view - NW. of San Blas, Hay., Mex.  
Legit. C. Snell, 1967.  
Diam. largest shell - 1.3 mm.

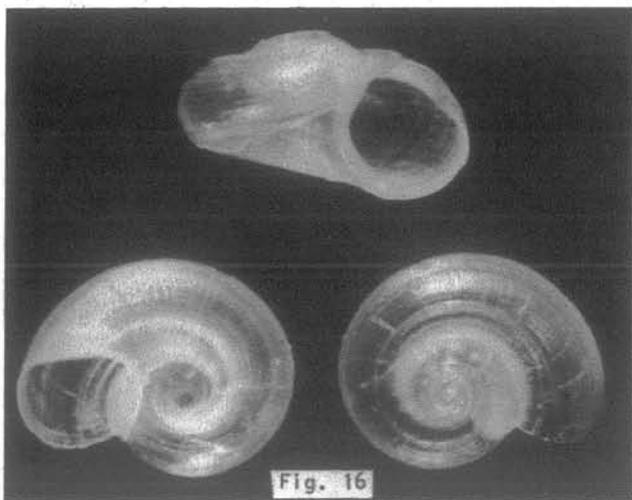


*Cyclostremiscus trigonatus* (Carpenter, 1857).  
B. Draper Coll. Marua Estero, Puerto Penasco,  
Son., Mex. Legit. B. Draper, Oct. 1973. Diam.  
1.4 mm.

shiny ivory. Two other species, quite similar to the above five, are shown in Figures 15 and 16. Though the axial sculpturing is almost entirely absent, the shape and general appearance are the same. These two species are: *C. cerrosensis* (Bartsch, 1907) and *C. tenuisculptum* (Carpenter, 1857).



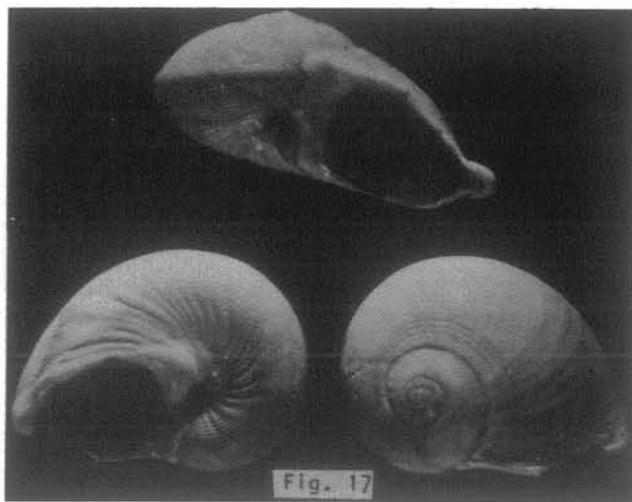
*Cyclostremiscus cerrosensis* (Bartsch, 1907).  
LACM 66-19. 5-20 ft., Pulmo Bay, Baja Cal.,  
Mex. Legit. McLean & Oringer, April, 1966.  
Diam. 1.9 mm.



*Cyclostremiscus tenuisculptum* (Carpenter, 1857).  
B. Draper Coll. Cholla Bay, Puerto Penasco,  
Son., Mex., at low tide. Legit. B. Draper,  
Oct. 1973. Diam. 1.7 mm.

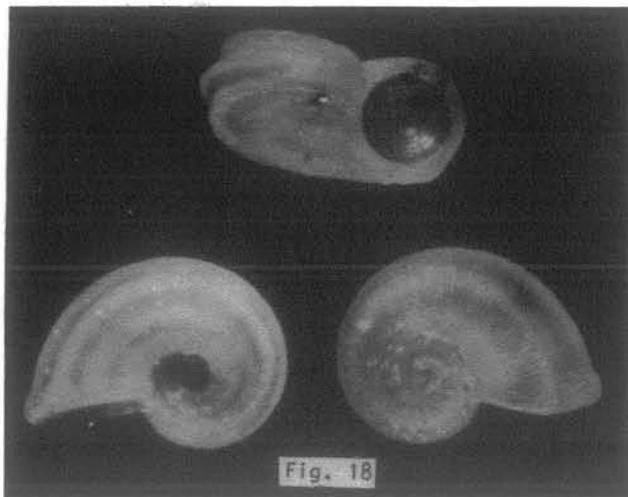
Other species which resemble the last seven examples illustrated here are: *C. adamsi* (Bartsch, 1911); *C. balboa* Pilsbry & Olsson, 1945; *C. lowei* (Baker, Hanna & Strong, 1938); *C. perparvus* (C. B. Adams, 1852); *C. peruvianus* Pilsbry & Olsson, 1945; *C. veleronis* (Strong & Hertlein, 1947); and *C. xantusi* (Bartsch, 1907). There is a great deal of variation in sculpture within several of the species of this group and further study may show them to be varieties of the same species.

*Miralabrum*, the second subgenus of *Cyclostremiscus*, has only two species from our coast: *C. (M.) planospiratus* (Carpenter, 1857) and *C. (M.) unicornis* (Pilsbry & Olsson, 1945). Both were named and described from single imperfect shells. Figure 17 shows one specimen of *C. (M.) unicornis* which is in the Los Angeles County Museum and which is in better condition than the holotype, but still not a perfect shell. This is the only specimen of this subgenus I have seen.



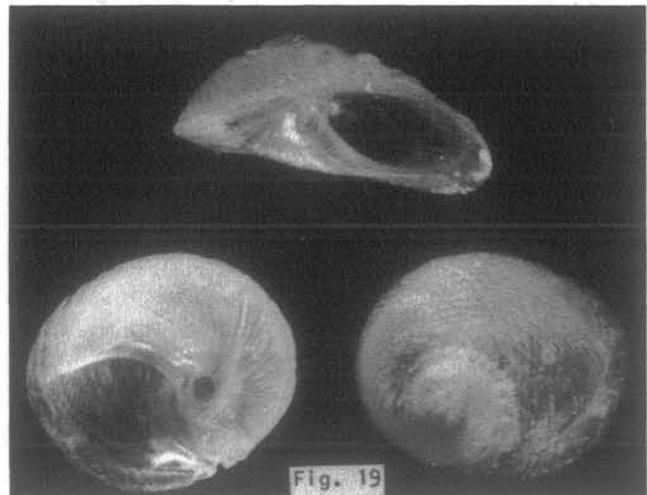
*Cyclostremiscus (Miralabrum) unicornis* (Pilsbry & Olsson, 1945). LACM 61-6. 20 fath. So. of Punta Final, San Luis Gonzaga Bay, Baja Cal., Mex. Legit. Campbell, Shasky & Sphon, Jan. 1961. Maximum diam. 3.6 mm.

The final subgenus, *Pachystremiscus*, includes only a single species from the eastern Pacific: *Cyclostremiscus* (*P.*) *pachynepion* Pilsbry & Olsson, 1945 (Fig. 18). Specimens are quite plentiful in material gathered along the Costa Rican shores by a recent expedition with the Research Vessel SEARCHER and now in the Los Angeles County Museum collection. Specimens have also been taken at many other localities ranging from the Gulf of California to northern Peru and the Galapagos Islands. The shells are very tiny, seldom exceeding 1 mm in diameter. The adults differ from most other species of *Cyclostremiscus* in the thickened outer edge of the aperture. They have four strong spiral ridges which give the shell a squarish shape. The entire shell is covered with minute, closely spaced axial threads which appear to radiate from the center of the shell. Around the almost flat spire is a series of raised nodes which become obsolete on the final whorl. When viewed through a 20 or 30 power microscope these tiny yellowish shells are quite beautiful, and provide a nice conclusion to this extensive genus.



*Cyclostremiscus* (*Pachystremiscus*) *pachynepion*  
Pilsbry & Olsson, 1945. LACM 72-22. 8-12 ft.  
NW. side of Isla San Pedrito, Costa Rica. Legit.  
LaFollette & Cadien, Febr. 1972. Diam.  
0.9 mm.

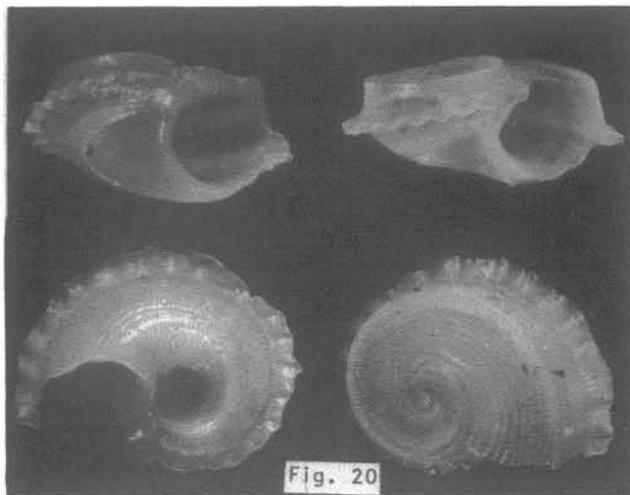
The next genus of Vitrinellidae is *Discopsis* deFolin & Perier, 1870. We do not have any representatives of the subgenus *Discopsis* s.s. on the West Coast, but we do have at least one species of the subgenus *Alleorus* Strong, 1938, *D.* (*A.*) *deprellus* (Strong, 1938). Figure 19 shows three views of one of these small shells, seldom exceeding 2 mm in diameter. They are flatly cone shaped, enlarging quite rapidly, which results in a relatively large aperture, obliquely occupying about one-third of the ventral side of the shell. The sculpture consists of fine spiral threads which are crossed by obliquely curved axial ridges, making the spiral threads look wavy. The ends of these axial ridges become stronger, forming nodes along the periphery next to the suture line. The shells are tiny and quite fragile, hence few perfect specimens have been collected. The known range of this species extends from the north end of the Gulf of California to Costa Rica. At least two other species with similar looking shells have been assigned to this genus, *D. argentea* Bartsch, 1918, and *D. panamensis* Bartsch 1918; however both are now assigned to *Macromphalina* Cossman, 1888, on the basis of their elevated nucleus and certain other characteristics.



*Discopsis* (*Alleorus*) *deprellus* (Strong, 1938).  
B. Draper Coll. In tidal drift, Marua Estero,  
Puerto Penasco, Son., Mex. Legit. B. Draper,  
Oct. 1973. Diam. 1.9 mm.

The genus *Episcynia* Mörch has three species described from the Panamic Province and one from California. The best known of these is *Episcynia medialis* which was originally described and figured by Myra Keen (1971). The other two Panamic species are *E. bolivari* Pilsbry & Olsson, 1946, and *E. nicholsoni* (Strong & Hertlein, 1939). Compared to *E. medialis*, the shell of *E. bolivari* lacks the groove at the suture and the beading around the edge of the shell is weaker and finer. *E. nicholsoni* is a more depressed shell than either *E. bolivari* or *E. medialis* and also lacks the sutural groove. The California species, *Episcynia deveva* Keen, 1946, has been found in southern California coastal waters. It is somewhat larger than the three Panamic species, has a more deflected final or body whorl, bringing the aperture more in under the previous whorl. A row of tiny oblique marks replaces the edge beading in the other species. All species in this genus have a peculiar periostracum which extends in frills outward from the finely beaded peripheral keel, sometimes looking like tufts of hairs. This periostracum sheds off very easily, seldom remaining intact after the shell is collected. The shells are also quite fragile and must be handled with great care.

The final genus of Vitrinellidae to be discussed in this paper is *Lydiphnis* Melville, 1906. No species of the subgenus *Lydiphnis* s.s. occur in the Panamic Province. However we do have four species in the subgenus *Cymatopteryx* Pilsbry & Olsson, 1946. Myra Keen (1971) shows drawings of two species which hardly do justice to these attractive shells. Figures 20 and 21 each show four views of species in this subgenus. Figure 20 shows *L. (C.) cymatotropis* Pilsbry & Olsson, 1945. and Figure 21 shows *L. (C.) strongi* Pilsbry & Olsson, 1952. The latter is a more mature specimen and shows the beautiful sculpture of this species, including the extended frilly keel around the periphery of the shell. These shells are small, less than 3 mm in diameter and range from grayish



*Lydiphnis strongi* Pilsbry & Olsson, 1952. LACM 73-7. Solidita Bay, Guaymas, Son., Mex. Legit. J. McLean, 1973. Diam. 2.5 mm. (4 views of same shell).



*Lydiphnis cymatotropis* Pilsbry & Olsson, 1945. LACM 66-20. In 20 ft., so. end of Pulmo Bay, Baja Cal., Mex. Legit. McLean & Oringer, Apr. 1966. Diam. 1.3 mm. (4 views of same shell).

white to ivory in color. The other two species in this subgenus are *L. (C.) cineta* (Carpenter, 1857) and *L. (C.) mariae* (Baker, Hanna, & Strong, 1938). Each of these was named from a single shell, and the figures show considerable similarity to the two species illustrated. Carpenter's descrip-

tion of *L. (C.) cincta* mentions only numerous spiral striae on the base keels that are not prominent. His specimen was probably immature and hence lacked the prominent peripheral keel. *L. (C.) mariaae* is described as having five spiral keels and many curved axial riblets which render the spiral keels tuberculate. The main peripheral keel is less prominent than in *L. strongi* and is described as having 36 tubercles around the outer edge.

This concludes Part 8 of MINUTE SHELLS. In Part 9 I will continue with additional genera from the family Vitrinellidae.

(All photos by Bert Draper. Most photos show three or four views of the same shell. All shells were identified by the author, using references cited).

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The following references were used in addition to those listed in Part 7.

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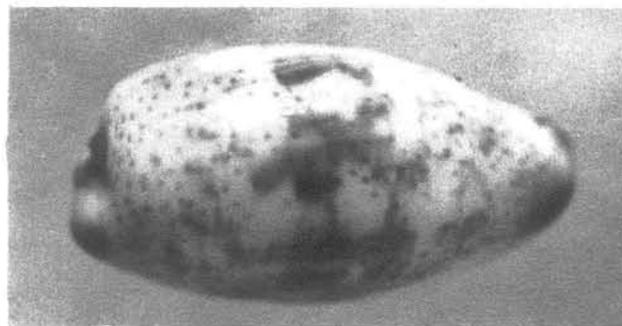


#### CORRECTION

"Shelling in the Reef Islands" (TABULATA Vol. 7 No. 2), page 29, line 32 of the right hand column: *S. mirabilis* should read *S. mutabilis*.

#### more.... COWRIE SHELLS

both trips. Since this area can be reached only by boat I was expecting rather good shelling. As it turned out, results were rather meager. However, my catch for the day did include one live *Cypraea helvola* Linnaeus, 1758; one live *C. fimbriata* Gmelin, 1791; and two live *C. isabella* Linnaeus, 1758. This was the only occasion when I found either *C. isabella* or *C. helvola* alive. I did find one other live *C. fimbriata* on March 12, 1974 in about 100 feet of water under dead coral off Pebble Beach. On a few other occasions I found dead *C. isabella* in fair to poor condition, and also one dead *C. helvola* in rather good condition.



*Cypraea fimbriata* Gmelin, 1791  
11 mm (approx. x 6)

There are only two other cowries that I can report finding on the Kona Coast: *Cypraea teres* Gmelin, 1791, and *C. poraria* Linnaeus, 1758. Both were dead but in good condition. I found the *C. poraria* at Pebble Beach under a small rock in shallow water. *Cypraea teres* was found dead in about 50 to 60 feet of water on a large sand patch at Hookena Beach.

In concluding, I must report that I found no trace of the (at least) thirteen other cowries known to inhabit Hawaiian waters. Of course this does not mean that they are not to be found on the Kona Coast. It may be that they are more easily found on other islands of the Hawaiian Chain.

(Photos by Jim Cordy)