

NOTES ON CANCELLARIIDAE (MOLLUSCA: GASTROPODA) – III

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ABSTRACT

This paper is the third in a series devoted to the gastropod family Cancellariidae. In this paper seven new species are described and illustrated. Of the new taxa, two are from the Tertiary of Panamá, one from the Tertiary of Virginia. One Recent species is from the Galápagos Islands, one is from West Africa, and two are from the tropical western Atlantic.

Agatrix epomis (Woodring, 1928), originally described from the Bowden Formation of Jamaica, is reported from the Recent fauna of Venezuela.

A possible deep-water form of the shallow water species *Cancellaria reticulata* (Linné, 1767) is illustrated and discussed. The taxon *Voluta cancellata* Linné, 1767, is also discussed. In addition, *Cancellaria dalli* Bartsch, 1915, is shown to be a synonym of *Trigonostoma bullatum* (Sowerby, 1832), and there is a short discussion of the genus *Admetula* and its distinction from *Agatrix*.

ACKNOWLEDGEMENTS

The writer is indebted to Axel A. Olsson, Coral Gables, Florida, for making known the existence of the Western Atlantic Recent species treated herein, and to Gilbert L. Voss and Frederick M. Bayer of the Division of Biology and Living Resources of the Rosenstiel School of Marine and Atmospheric Sciences, University of Miami, for permitting study of these specimens.

Loan of collections of the Geology Department of Tulane University has greatly facilitated the study of this family, and the advice and assistance of Emily H. Vokes has been invaluable.

Expressions of appreciation are also due to Joseph Rosewater and Harald A. Rehder of the National Museum of Natural History, Washington, D.C., and to C. P. Nuttall of the

Geology Department, British Museum (Natural History), London, for assistance in using their libraries and collections during visits to their respective institutions.

For contributing specimens for study, the writer is indebted to Carl C. Withrow, St. Petersburg, Florida; T. Walley Williams, Morgantown, West Virginia; and Mrs. Jacqueline DeRoy, Isla Santa Cruz, Galápagos Islands, Ecuador.

The continued assistance of Druid Wilson, U.S. Geological Survey, Washington, D.C., is gratefully acknowledged.

SYSTEMATICS

The family Cancellariidae traditionally has been placed in the Superfamily Volutacea, usually near the Mitridae and Volutidae. In a recent paper, Olsson (1970) has shown that the Cancellariidae possess an entirely different type of radula than any previously known, and he has proposed the new order Nematoglossa. Ponder (1973, p. 323) states that division on the ordinal level is not necessary, but introduced the superfamilial taxon Cancellariacea, which has been subsequently adopted by Keen and Coan (1974, p. 138). Suprageneric classification is beyond the scope of this paper, and mention is made of this subject only to call attention to Olsson's important work.

Genus CANCELLARIA Lamarck, 1799

Cancellaria LAMARCK, 1799, *Mém. Soc. Hist. Nat. Paris*, v. 1, p. 71.

Type, by monotypy, *Voluta reticulata* Linné, 1767. Recent, North Carolina to Brasil.

CANCELLARIA cf. RETICULATA

(Linné, 1767)

Plate 1, fig. 1

Voluta reticulata LINNÉ, 1767, *Systema Naturae*, Ed. 12, p. 1190, no. 408.

Two specimens of a large *Cancellaria* were taken by the R/V *Gerda* at depths of 40-47

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and 95 meters off of the Florida Keys. These shells are much more attenuate than shallow-water specimens of *C. reticulata*, and have much finer sculpture. In shape they approach the Tertiary *C. conradiana* Dall.

Cancellaria conradiana was described by Dall (1890, p. 42) without locality, but it is evident that he was describing a fossil and Schuchert (1905, p. 124) subsequently noted that the holotype was from the Caloosahatchee River at Fort Thompson. Later (Dall, 1892, p. 211), the name appears in a species list of the Waccamaw fauna, where it is stated as being known only from the Pliocene.

The first appearance of the name *C. conradiana* was as a nude name (Dall, 1889, p. 104) where it is listed in the Recent fauna of west Florida and in the Pliocene. *Cancellaria conradiana* Dall was listed by Johnson (1934, p. 144) as a Recent species. As mentioned by Gardner (1948, p. 264) there are no Recent specimens of *C. conradiana* in the U. S. National Museum. Recent searches for such specimens by Mr. Druid Wilson, U. S. Geological Survey (personal communication), and by the writer, confirm Dr. Gardner's statement. No Recent specimens of *C. conradiana* are known to the writer, although it is a common fossil in the late Tertiary of the Carolinas and Florida. The Recent specimen figured as *Cancellaria conradiana* by Perry (1940, pl. 39, fig. 276) and by Perry and Schwengel (1955, pl. 39, fig. 276) appears to be a rather high spired, albinistic *C. reticulata*, with typical rough surface.

The two Recent specimens under discussion have a slightly smoother surface than the rough *C. reticulata*, but are more strongly sculptured than *C. conradiana*. Although the height/width ratio of these two specimens is comparable to that cited by Dall for *C. conradiana*, they are less attenuate than examples of *C. conradiana* of equal height in the writer's collection from the Waccamaw Formation of South Carolina. The Recent subspecies *C. reticulata adelae* Pilsbry, 1940, while smooth, has the form of typical *C. reticulata*.

These two specimens may represent a deep-water form of *C. reticulata*, although if enough specimens were available for study it

might show that they represent a different species. Definitive identification of these two specimens must await availability of additional material.

Figured specimen: Rosentiel School of Marine and Atmospheric Science no. 30-7525; height 42.5 mm, diameter 22.1 mm; locality Gerda Station G-756, Florida Keys, Florida.

Subgenus BIVETIELLA Wenz, 1943

Bivetiella WENZ, Handbuch Paläozoologie, v. 6, Gastropoda, p. 1356.

Type, by original designation, *Cancellaria similis* Sowerby, 1833. Recent, West Africa.

CANCELLARIA (BIVETIELLA) CANCELLATA (Linné, 1767)

Murex scabriculus LINNÉ, 1758, Systema Naturae, ed. 10, p. 751, no. 473.

Voluta cancellata LINNÉ, 1767, Systema Naturae, ed. 12, p. 1191, no. 413.

This well known species was first described by Linné in 1767. In the 12th Edition of the *Systema Naturae* he changed the placement of the species from *Murex* to *Voluta*. As he was also moving his *Buccinum scabriculum* of the 10th Edition to *Voluta* in the 12th Edition, he changed the name of *Murex scabriculus* to *Voluta cancellata* to avoid homonymy.

Under the rules of nomenclature in effect during recent years, the taxon *scabriculus* would be available in *Cancellaria*. A search of the literature reveals only two uses of the name, one of which is in a list (H. & A. Adams, 1854, p. 276), which also includes *Cancellaria cancellata*. The only clear use of *scabriculus* as the proper name for this species is by Pallary (1900, p. 259), who cites the name as *scabriusculus* instead of *scabricula*. This spelling error originated with Linné (1767, p. 1191) who referred back to "*Murex scabriusculus*" in his discussion of *Voluta cancellata*.

A history of the species is given at length by Dodge (1955, pp. 99-101), but he does not mention the availability of *scabricula* to replace *cancellata*. Fortunately, the specific name *cancellata* can be retained under the new I.C.Z.N. rule (Article 59i), which states that a junior secondary homonym rejected before 1961 is permanently rejected. Publi-

cation of this rule in 1973 makes a previously planned petition to the I.C.Z.N. for retention of *C. cancellata* unnecessary.

Subgenus SVELTIA Jousseume, 1887

Sveltia JOUSSEAUME, 1887, Le Naturaliste, ser. 2, v. 1, fasc. 18, p. 214.

Type, by original designation, "*Sveltia varicosa* Brocc." (= *Voluta varricosa* Brocchi, 1814). Pliocene, Italy.

CANCELLARIA (SVELTIA) GLADIATOR n. sp.

Plate 1, fig. 2

Diagnosis: Protoconch smooth, helicoidal, composed of just over three whorls. Protoconch eroded on most adult specimens, but prominent on juveniles. Body whorl large, forming over two-thirds of total length of shell; the whorls well shouldered, with long spines at regular intervals. Sculpture consisting of five to seven well-formed varices, which are produced into long, open spines at the shoulder angle, with smaller but prominent spines on the spiral ridge immediately below the shoulder. The posterior one-third of the body whorl devoid of sculpture except for the spiral cord at the shoulder. The anterior portion of the body whorl consisting of about seven widely spaced spiral cords, which produce short spines at the varices. Aperture ovate, the outer lip thin, the spiral sculpture in evidence being marked by corresponding depressions on the interior. The columella with three prominent sharply descending folds, the posterior one being larger and the anterior one forming a keel bordering the rounded siphonal canal. A moderately heavy parietal callus present on adult specimens. The shell thin for its size, and translucent.

Dimensions of holotype: height 52.1 mm; diameter 25.4 mm (exclusive of shoulder spines); diameter 39.6 mm (inclusive of shoulder spines).

Holotype: USNM 760634.

Type locality: Southern coast of Academy Bay, Isla Santa Cruz, Galápagos Islands, 200 meters.

Occurrence: Recent, known only from the Galápagos Islands.

Figured specimen: USNM 760634 (holotype).

Discussion: Although this species is spinose in much the same manner as the type of *Calcarata* Jousseume, 1887, other characters relate it more closely to *Sveltia*, which is known from the Tertiary of Europe and Ecuador, and Recent off of West Africa and the Pacific coast of Central America. Placement in this subgenus is tentative pending a complete review of the family.

Cancellaria (Sveltia) gladiator is closely related to *C. centrota* Dall, 1896, but differs from that species in its greater development

of shoulder spines, and the presence of a second row of spines on the first spiral ridge anterior to the shoulder. These spines are open in *C. gladiator*, but in *C. centrota* they are largely closed. Also, *C. centrota* is a much heavier and thicker shell. *Cancellaria gladiator* is also closely allied to *C. trochilia* Olsson, 1964, from the Neogene of Ecuador, but differs from that species by having longer, more delicate spines, and by the presence of fewer and stronger spiral cords. The large size and long spines, as well as the second row of spines, easily separates *C. gladiator* from the Recent Panamic Pacific *C. centrota* Dall.

All known specimens were dredged by Mrs. Jacqueline DeRoy, Isla Santa Cruz, Galápagos Islands. Paratypes have been distributed to other interested institutions.

Genus OLSSONELLA Petit, 1970

Olssonella PETIT, 1970, Tulane Stud. Geol. Paleont., v. 8, no. 2, p. 83.

Type, by original designation, *Cancellaria smithii* Dall, 1888. Recent, tropical Western Atlantic.

OLSSONELLA PANAMICA n. sp.

Plate 2, fig. 1

Diagnosis: Shell scalate. Protoconch smooth, of about two and one-half whorls. Body whorl, which comprises one-half of total shell length, sculptured with six to eight strongly arched axial ribs crossed by about twelve spiral cords, very weak in the interspaces but strong where they cross the axial ribs. Shoulder well rounded with impressed suture. Aperture narrowly ovate with about nine or ten strong lirae on interior of outer lip. Columella with two folds and a swelling near the base, which might appear to be a third fold. Umbilicus narrow and deep, bounded by a rounded umbilical ridge.

Dimensions of holotype: height 12.5 mm; diameter 7.7 mm.

Holotype: USNM 220090.

Type locality: TU 757, hillslope on south side of Transisthmanian Highway at junction of road to Refineria Panamá, just east of Cativa, Colon, Panamá. Gatun Formation, Pliocene.*

Occurrence: Known only from the Gatun Formation, Panamá.

Figured specimen: USNM 220090 (holotype).

*Many of the Neogene formations of the western Atlantic region are being recognized as younger than formerly thought, on the basis of planktonic foraminifera and calcareous nannofossil dating. Thus a number of the formations that have been cited as middle and upper Miocene are now considered to be Pliocene or Pleistocene in age.

Discussion: This is the species listed by Woodring (1970, p. 345), from fragments, as *Trigonostoma* cf. *T. scalatella* (Guppy). Of the two specimens collected by this writer, one is complete and the other lacks only the final portion of the body whorl. Unfortunately the perfect specimen was broken during cleaning, but it was possible to cement it back together with loss of only a small piece of the anterior portion of the lip. The type has been deposited in the USNM as indicated, and the other specimen, almost identical in size, remains in the writer's collection. Another paratype, a complete adult specimen, but slightly worn and fractured, was collected by Drs. H. E. and E. H. Vokes and is also in the USNM.

This new species is very close to *O. campbelli* (Shasky) of the Recent Panamic Pacific fauna, but differs from that species in being much less tabulate, as the sutures are not nearly so impressed, and it therefore lacks the recurved shoulder of *O. campbelli*. *Olssonella panamica* also lacks the secondary spiral cords that are present in the Recent species and in the closely related *O. scalatella* (Guppy) of the Bowden Formation of Jamaica.

In addition to the specimens discussed, a portion of another specimen consisting of

one complete whorl was collected at a nearby locality (TU 958) by Drs. H. E. and E. H. Vokes. This fragmentary specimen is in the Tulane University collection.

OLSSONELLA WILLIAMSI n. sp.

Plate 2, fig. 2

Diagnosis: Shell scalate. Protoconch unknown, first postnuclear whorl smooth, rounded. Shell consisting of about six whorls, which are strongly shouldered with a deep suture. Sculpture of strong rounded axial ribs, numbering seven on the body whorl, crossed by about fifteen evenly spaced spiral cords, which rise over the axials. Intermediate weaker cords between some of the spirals. Aperture roughly trigonal, being rounded at the shoulder. Outer lip rounded with about nine interior lirations. Columella straight, with two folds, the posterior one being stronger and the anterior one descending. Umbilicus narrow and deep.

Dimensions of holotype: height 17.4 mm; diameter 8.4 mm.

Holotype: USNM 220091.

Type locality: TU locality 613, "Rice's Pit," Hampton, Virginia. Yorktown Formation, Pliocene.

Occurrence: Known only from the type locality.

Figured specimen: USNM 220091 (holotype).

Discussion: This species is closest to *Olssonella campbelli* (Shasky, 1961) from the Recent Panamic Pacific fauna, and differs from that species by the narrower,

PLATE 1

Figures	Page
1. <i>Cancellaria</i> cf. <i>reticulata</i> (Linné) (X1½)	33
Rosenstiel School of Marine and Atmospheric Science 30-7525; height 42.7 mm, diameter 22.1 mm.	
Locality: Florida Keys, Recent.	
2. <i>Cancellaria</i> (<i>Sveltia</i>) <i>gladiator</i> R. E. Petit, n. sp. (X1)	35
USNM 760634 (holotype); height 52.1 mm; diameter 25.4 mm (exclusive of shoulder spines; diameter 39.6 mm (inclusive of shoulder spines).	
Locality: Academy Bay, Isla Santa Cruz, Galápagos Islands, 200 meters. Recent.	
3. <i>Agatrix</i> <i>epomis</i> (Woodring) (X3)	38
USNM 747976; height 14.6 mm, diameter 8.5 mm.	
Locality: Pillsbury Station P-734, Venezuela. Recent.	
4. <i>Admetula</i> <i>bayeri</i> R. E. Petit, n. sp. (X2)	38
USNM 747977 (holotype); height 19.4 mm, diameter 13.5 mm.	
Locality: Gerda Station G-952, off Yucatán Peninsula, Mexico. Recent.	
5. <i>Admetula</i> <i>vossi</i> R. E. Petit, n. sp. (X3)	39
USNM 747978 (holotype; height 12.8 mm, diameter 8.5 mm.	
Locality: Gerda Station G-524, Bahamas, Recent.	

All specimens were whitened before photographing to show details of sculpture.

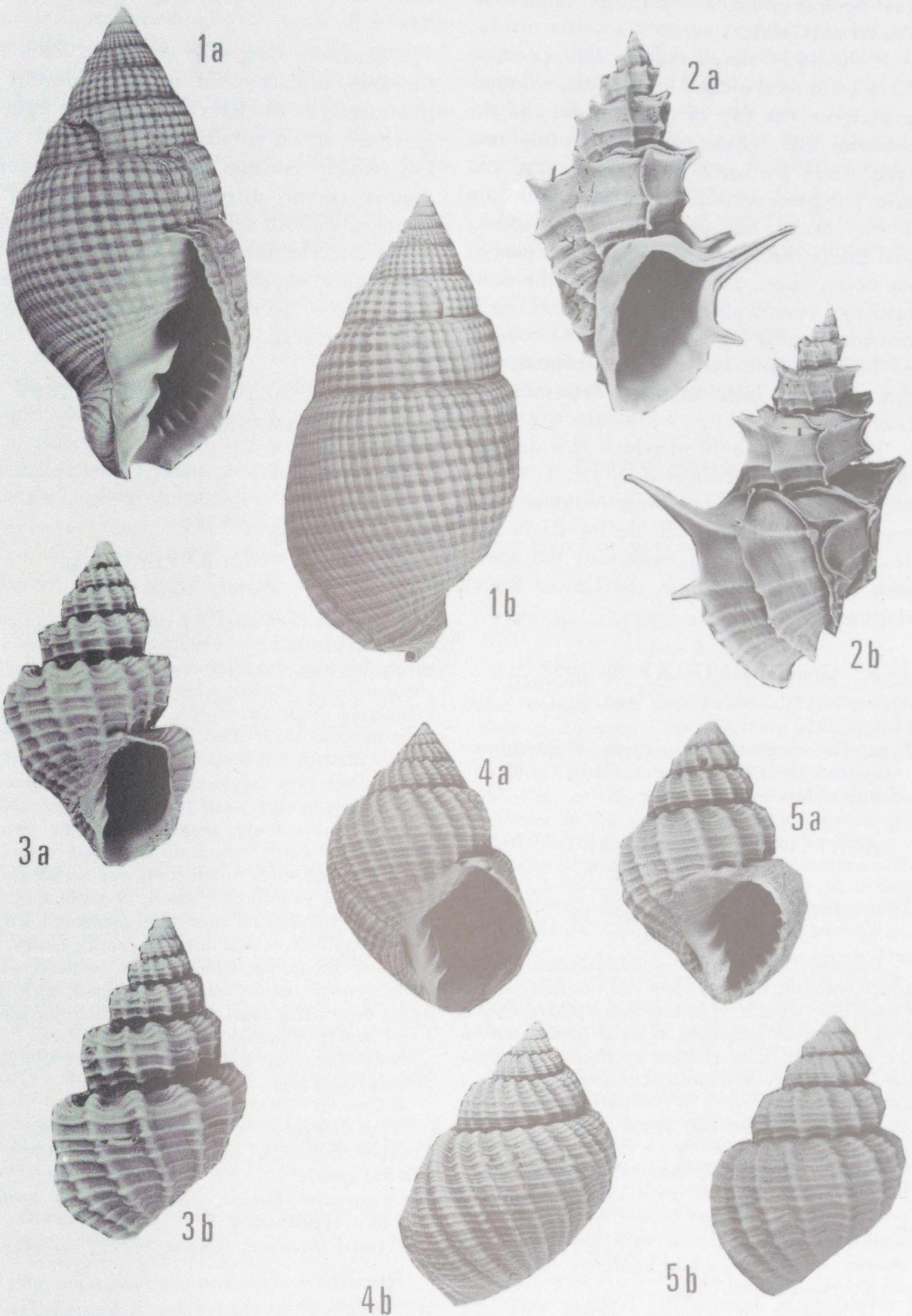


PLATE 1

less open umbilicus and more numerous, weaker axial ribs.

It should be noted that on this specimen there are several incised lines on the columella between the top of the aperture and the posterior fold. These grooves obviously have been made by some external agency, and have not been considered in the description of the species. Irregular grooves also appear well inside the aperture on the outer part of the body whorl, possibly made by the same agency responsible for the columella grooves. Similar grooves have been observed on both Recent and fossil gastropods, but this writer has been unable to determine the exact cause.

The unique shell on which this description is based was collected by Dr. T. Walley Williams, Morgantown, West Virginia, who made the specimen available for study and description, and who permitted the specimen to be deposited in the United States National Museum.

Genus AGATRIX Petit, 1967

Agatrix PETIT, 1967, Tulane Stud. Geol., v. 5, no. 4, p. 218.

Type, by original designation, *Trigonostoma agassizii* Dall, 1889. Recent, North Carolina to Gulf of Mexico.

AGATRIX EPOMIS (Woodring, 1928)

Plate 1, fig. 3

Tribia epomis WOODRING, 1928, Carnegie Inst. Washington, Publ. 385, p. 223, pl. 12, fig. 10.

Diagnosis: Shell high spired, tabulate. Protoconch smooth, of about one and one-half whorls. Postnuclear whorls six in number, strongly shouldered. Sculpture consisting of axial riblets, ten on the body whorl, overridden by thin, sharp spiral cords set between smooth interspaces, forming a cancellate appearance. A well-defined shoulder, smooth near the suture. Spiral cords, numbering about fourteen, beginning on the shoulder nodes, with five of the spiral cords being crowded onto the shoulder nodes. The remaining spiral cords are evenly spaced. Aperture ovate, the outer lip thin. Slightly concave columells with three folds, the anterior one forming a keel bordering the siphonal canal. Umbilicus chink-like.

Dimensions of holotype: height 11.8 mm, diameter 7.3 mm.

Holotype: USNM 135418.

Type locality: Bowden, Jamaica (= TU 705).

Occurrence: Bowden Formation, Jamaica (Pleistocene) and off the coast of Venezuela (Recent).

Figured specimen: USNM 747976; height 14.6 mm, diameter 8.5 mm; Pillsbury Station P-734, off

coast of Venezuela, 11°01'N, 65°36'W, 60-68 meters.

Discussion: Originally described from the Bowden Formation, this is the first report of this species in the Recent fauna. The figured specimen agrees in all details with the type lot, which consists of three specimens. *Agatrix epomis* differs from *A. agassizii* in having a smooth area between the shoulder nodes and the suture, in having the suture less deeply impressed, and in having spiral cords more widely spaced with resultant wide interspaces.

Genus ADMETULA Cossmann, 1889

Admetula COSSMANN, 1889, Ann. Soc. Roy. Malac. Belg., v. 24, p. 228.

Type, by original designation, *Cancellaria evulsa* (Solander), (= *Buccinum evulsa* Solander, 1766). Eocene, England.

ADMETULA BAYERI n. sp.

Plate 1, fig. 4

Diagnosis: Shell large for the genus, white with porcellaneous shine on interior of outer lip and columellar area. Protoconch smooth, consisting of about one and one-half whorls. Postnuclear whorls numbering about six, rapidly enlarging to a somewhat naticoid shape. Periostracum fine and rather thickly matted, but basic sculpture visible through the periostracum. Sculpture of regularly spaced, close set, rounded axial ribs numbering about sixteen on the body whorl, crossed by evenly spaced spiral cords, which do not form nodes as they cross the axials. Spiral cords numbering about eight on the penultimate whorl. Shoulders rounded, suture impressed. Outer lip rounded and ventricose, a slight stromboid notch appearing below the center of the lip, but which cannot be detected in earlier growth lines. Columella inclined, with two strong descending folds and a third fold that forms a keel bordering the siphonal canal.

Dimensions of holotype: height 19.4 mm, diameter 13.5 mm.

Holotype: USNM 747977.

Type locality: Gerda Station G-952, off Yucatán Peninsula, Mexico, 21°02'N, 86°26'W, 585-591 meters.

Occurrence: Recent, Gulf of Mexico, known only from type locality.

Figured specimen: USNM 747977 (holotype).

Discussion: This and the following species are assigned to the genus *Admetula*, even though the type of genus is an Eocene species from England. Examination of the type specimen of *Admetula evulsa* (Solander) in the British Museum (Natural History), and subsequent procurement of additional specimens for comparative study have enabled the writer to make this assign-

ment. The type of the genus is much like the species described above, with the same rounded outline and a strongly inclined columella with identical fold structure. *Admetula evulsa* differs primarily in having rounded varices, whereas none of the Recent species being assigned to *Admetula* have varices.

Agatrix differs from *Admetula* in being turreted, having a proportionately narrower aperture, and in having a less concave columella. Adult specimens of *Agatrix* develop a thin parietal shield. Only two species of *Agatrix* have been live-collected with periostracum intact, but in both of these (*A. agassizi* Dall and *A. strongi* Shasky) the periostracum is tufted at the shoulders, a feature not present in *Admetula bayeri*, which has a smooth, evenly distributed periostracum. The recently described *Agatrix deroyae* Petit, 1970, was incorrectly placed, and is an *Admetula* as the genus is now interpreted by the writer.

This new species is named for Dr. Frederick M. Bayer, Division of Biology and Living Resources of the Rosenstiel School of Marine and Atmospheric Sciences, University of Miami.

ADMETULA VOSSI n. sp.

Plate 1, fig. 5

Diagnosis: Protoconch unknown; postnuclear whorls about six in number. Whorls rounded, body whorl large. Sculpture consisting of axial riblets, about twelve on the body whorl, which are crossed by narrow, evenly spaced spiral cords forming small nodes on the summit of the ribs, there being about seventeen spiral cords between the suture and the anterior canal. Weaker intermediate spirals sometimes occurring between the primary spiral cords. Aperture semi-ovate, with about eight lirations within the outer lip. Siphonal canal well rounded, but not produced nor forming a fasciole. Three columellar plaits, on an inclined pillar, the anterior one forming a keel bordering the siphonal canal.

Dimensions of holotype: height 12.8 mm, diameter 8.5 mm.

Holotype: USNM 747978.

Type locality: Gerda Station G-524, south of Grand Bahama Island, Bahamas, 26°17'N, 78°41'W, 622-695 meters.

Occurrence: Recent, Bahamas, known only from type locality.

Figured specimen: USNM 747978 (holotype).

Discussion: This new species is known only from a single incomplete specimen. It is remarkably similar to *Admetula deroyae*

(Petit, 1970) from the Galápagos Islands, which is also a deep-water species. This new species differs from *A. deroyae* in having rounded shoulders, whereas *A. deroyae* has slightly shouldered whorls. Also, the spiral cords in *A. vossi* are weaker than the spiral cords in *A. deroyae*, and do not become as enlarged where they cross the axial ribs. *Admetula zapoteca* (Böse, 1910) from the Pliocene of Tehuantepec is quite similar, but is more attenuate.

This species is named for Dr. Gilbert L. Voss, Division of Biology and Living Resources of the Rosenstiel School of Marine and Atmospheric Sciences, University of Miami.

Genus TRIGONAPHERA Iredale, 1936

Trigonaphera IREDALE, 1936, Rec. Aust. Mus., v. 19, no. 5, p. 319.

Type by original designation, *Trigonostoma vinnulum* Iredale, 1925. Recent Australia.

TRIGONAPHERA WITHROWI n. sp.

Plate 2, fig. 3

Diagnosis: Nucleus smooth, naticoid, of about two whorls. The first post-nuclear whorl with close-spaced spiral cords, which are later crossed by axial ribs. Postnuclear whorls number about five. Body whorl with strongly defined spiral cords, about six of which are crowded on the shoulder. Anterior to the shoulder about eight strong spiral cords, with three secondary spirals crowded in the interspaces. Body whorl with eight strong rounded axial ribs crossed by the spirals. At the shoulder these ribs are flattened and form a sharp ridge from the shoulder to the suture. Interspaces between these ribs concave and bearing fine spirals. Outer lip smooth, with strong definition in the interior. A smooth notch present just inside the shoulder, with three plications above and ten below, all of which extend well inside the shell. Columella slightly concave with three folds, the anterior one forming the top of the short, inclined siphonal canal. Columella slightly rugose. Small, deep umbilicus bordered by a strong umbilical ridge. Shell cream colored with reddish-brown maculations on the concave interspaces above the shoulder. Nucleus and first post-nuclear whorls brownish.

Dimensions of holotype: height 21.4 mm; diameter 15.7 mm.

Holotype: USNM 760635.

Type locality: Off Senegal, West Africa, 25 meters.

Occurrence: Recent, known only from the type locality.

Figured specimen: USNM 760635 (holotype).

Discussion: The off-shore fauna of north-west Africa is still relatively little known. This specimen was obtained by Mr. C. C.

Withrow, St. Petersburg, Florida, from a correspondent, Mr. I. Marche-Marchad. Correspondence to Mr. Marche-Marchad concerning this species remains unanswered. This new species has been named for Mr. Withrow, a well known collector and student of mollusca, who has made the specimen available for study and who has donated the holotype to the United States National Museum.

Nicklès (1950, p. 116, fig. 212) figures a West African cancellariid as *Cancellaria rigida* Sowerby. His illustration is of a shell quite distinct from the one under discussion, and appears to be a *Bivetopsia*. *Cancellaria rigida* Sowerby is also listed from West Africa by Marche-Marchad (1958, p. 31).

G. B. Sowerby I described *Cancellaria rigida* (1832, p. 53; 1833, p. 7, fig. 41) from a single specimen collected by Hugh Cuming, from Central America. The figure in the *Conchological Illustrations* is not good, and the type cannot be located. Two syntypes have been located in the British Museum (Natural History), catalog number BM(NH) 1964445. As noted by Keen (1958, p. 442; 1971, p. 658) and others, *C. rigida* Sowerby is a synonym of the rather variable *Cancellaria goniostoma* G. B. Sowerby I, 1832. It should be noted that all of the species described in Sowerby's 1832 paper were collected by Cuming on the Pacific coast of Central America.

Cancellaria costata "Gray" G. B. Sowerby I (1833, p. 7, fig. 42) was described without locality, and the figure could represent *T. withrowi*. However, the name is preoccupied by *Cancellaria costata* G. B. Sowerby I, 1821, *Genera of Recent and Fossil Shells*, no. 5, *Cancellaria*, fig. 2 (= *Voluta cancellata* Linné). G. B. Sowerby II (1849, pp. 456-7) figured *C. costata* and gave as locality "from the sands in the River Gambia." He also stated that he did not think *C. rigida* to be distinct. His figure 103, listed on plate explanation as "*costata* var. *rigida*," does not resemble the original figure of *C. rigida* in the *Conchological Illustrations*, and it is evident that even at this early date that there was a misunderstanding about the species involved.

To summarize, *Cancellaria rigida* G. B. Sowerby I, 1832, is a synonym of *C. goniostoma* G. B. Sowerby I, 1832. *Cancellaria costata* "Gray" G. B. Sowerby I, 1833, is a junior primary homonym of *C. costata* G. B. Sowerby I, 1821, which in turn is an objective synonym of *Cancellaria cancellata* (Linne). The specimens figured in *Conchological Illustrations* (figure 42) and in the *Thesaurus Conchyliorum* (figures 60, 61, 103) could not be located at the British Museum (Natural History) by the writer in 1968.

Trigonaphera withrowi seems most closely related to the Indo-Pacific *T. bicolor*

PLATE 2

Figures	Page
1. <i>Olssonella panamica</i> R. E. Petit, n. sp. (X3)	35
USNM 220090 (holotype); height 12.5 mm; diameter 7.7 mm.	
Locality: TU 757. Gatun Formation, Cativa, Colon, Panamá; Pliocene.	
2. <i>Olssonella williamsi</i> R. E. Petit, n. sp. (X3)	36
USNM 220091 (holotype); height 17.4 mm; diameter 8.4 mm.	
Locality: TU 613. Hampton, Virginia. Yorktown Formation, Pliocene.	
3. <i>Trigonaphera withrowi</i> R. E. Petit, n. sp. (X2)	39
USNM 760635 (holotype); height 21.4 mm; diameter 15.7 mm.	
Locality: Off Senegal, West Africa, 25 meters. Recent.	
4. <i>Trigonostoma (Ventrilia) sacellum</i> R. E. Petit, n. sp. (X2)	42
USNM 220092 (holotype); height 25.5 mm; diameter 18.3 mm.	
Locality: TU 958. Gatun Formation, Cativa, Colon, Panamá; Pliocene.	
5. <i>Trigonostoma (Ventrilia) senarium</i> Petit and Hoerle, n. sp. (X1½)	44
USNM 220085 (holotype); height 34.1 mm; diameter 26.3mm.	
Locality: TU 1000. Pinecrest Beds, Sarasota County, Florida; Pliocene.	

All specimens were whitened before photographing to show details of sculpture.

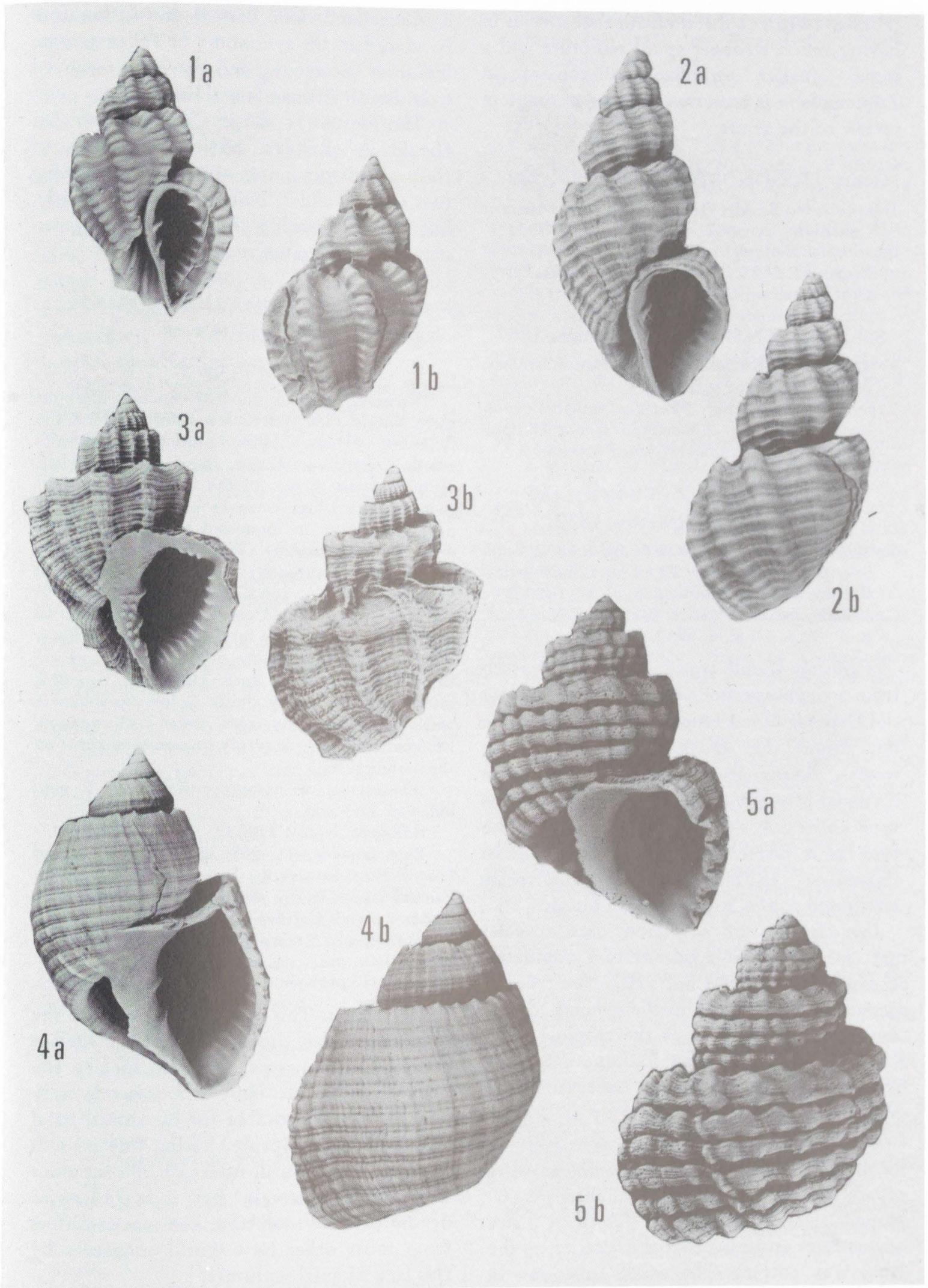


PLATE 2

(Hinds, 1843). It differs from that species in having much stronger spiral sculpture and a much smaller umbilicus. Placement in *Trigonaphera* is tentative pending a complete review of the genus.

Genus TRIGONOSTOMA Blainville, 1827

Trigonostoma BLAINVILLE, 1827, Man. Malac. et Conchyl., p. 652.

Type by monotypy, *Delphinula trigonostoma* Lamarck, 1822 (= *Trigona pellucida* Perry, 1811). Recent, Indo-Pacific.

Subgenus VENTRILIA Jousseume, 1887

Ventrilia JOUSSEAUME, 1887, Le Naturaliste, ser. 2, v. 1, fasc. 16, p. 194.

Type, by monotypy, *Ventrilia ventrilia* Jousseume, 1887 (= *Cancellaria tenera* Philippi, 1848). Recent, tropical Western Atlantic.

TRIGONOSTOMA (VENTRILIA) BULLATUM (Sowerby, 1832)

Cancellaria bullata G. B. SOWERBY I, 1832, Zool. Soc. London, Proc., v. 17, p. 51; Conchological Illustrations, *Cancellaria*, p. 6, pl. 12, fig. 35.

Cancellaria dalli BARTSCH, 1915, U. S. Nat. Mus., Bull. 91, p. 33, pl. 4, fig. 2.

Cancellaria dalli was described by Bartsch from a single specimen purported to be from the Cape of Good Hope. Later workers have not found this species in South African waters. Examination of the type in the National Museum of Natural History (USNM type collection no. 17074) reveals that the type is a juvenile *Trigonostoma bullatum* (Sowerby, 1832), and was incorrectly attributed to the South African fauna.

Investigation of accession data reveals that this specimen is one of two originally accessioned as USNM no. 5107. The second specimen, an adult, is in the general collection correctly labelled as the tropical west American *Trigonostoma bullatum* (Sowerby), although when originally accessioned, as one lot, they were recorded only as *Cancellaria*, without a species name and without locality. Evidently the two specimens were separated and the juvenile labelled "C. G. Hope," after which Bartsch described it as a new species assuming that the locality on the label was correct. The small collection in which these specimens were received contained species from various parts of the world, but most were from the west coast of the Americas. Nothing is known of the donor, Commodore Aulick.

Cancellaria dalli Bartsch must therefore be placed in the synonymy of *Trigonostoma bullatum* (Sowerby), and the name removed from South African faunal lists.

The writer is deeply indebted to Dr. Harald A. Rehder, National Museum of Natural History, not only for confirming that *C. dalli* and *T. bullatum* are conspecific, but also for tracing the origin of the specimens in the Museum records.

TRIGONOSTOMA (VENTRILIA)

SACELLUM n. sp.

Plate 2, fig. 4

Diagnosis: Nucleus smooth, naticoid, of about three whorls. First postnuclear whorl rounded, the following whorls rapidly forming a channeled suture. Postnuclear whorls, about five in number, rounded in the center of the whorl. Body whorl rounded with a high narrow shoulder behind dropping rapidly to an impressed suture, to form a deep, narrow channel. Small nodes formed by growth lines sometimes present on the shoulder at irregular intervals. Spiral sculpture consisting of slightly raised rounded cords, twelve or more on the body whorl, evenly interspaced with narrower spirals. No axial sculpture other than fine, irregularly spaced growth lines. Outer lip rounded, interior of lip evenly lirate. Columella inclined, with two descending folds. Basal keel rounded. Umbilicus deep, with evenly spaced spiral cords on the umbilical wall.

Dimensions of holotype: height 25.5 mm; diameter 18.3 mm.

Holotype: USNM 220092.

Type locality: TU 958, hillslope east of road from Boyd-Roosevelt highway to Refineria Panamá, about ½ km. north of junction at Cativa, Colon, Panamá. Gatun Formation, Pliocene.

Occurrence: Known only from the type locality.

Figured specimen: USNM 220092 (holotype).

Discussion: This species is unusual for the subgenus in that the shoulder of the shell is compressed, whereas in most species the upper part of the body whorl is relatively wide. It is also notable for its almost total lack of axial sculpture, having fine growth lines that form small nodes on the shoulder at irregular intervals, but it is otherwise devoid of axial sculpture. The species differs from most other New World congeners by this lack of axial sculpture.

Trigonostoma triumphia Olsson, 1964, of the Neogene of Ecuador also lacks axial sculpture, but that species has slight nodes on a central peripheral cord. Also, *T. triumphia* has a different overall shape, being

low-spired whereas *T. sacellum* is high-spired.

The only other *Trigonostoma* from this area without axial sculpture is *T. ecuadoriana* Pilsbry and Olsson, 1941, from the Pliocene of Ecuador. This species is distinguished by its evenly spaced strong spiral cords.

In general shape and sculpture *T. sacellum* resembles *T. tjibaliungense* (Martin, 1895) from the Pliocene of Java. *Trigonostoma tjibaliungense* differs in not being constricted at the shoulder and in having coarser spiral sculpture.

This new species is known only from two specimens collected by Drs. H. E. and E. H. Vokes. Both specimens have the outer lip broken. The type and the paratype, almost identical in size, have been deposited in the USNM.

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