Cyclococcolithina neogammation (Bramlette & Wilcoxen) Wilcoxen n. comb., = Cyclococcolithus neogammation Bramlette & Wilcoxen, 1967, Tulane Stud. Geol., v. 5, p. 104, pl. 1, figs. 1-3; pl. 4, figs. 3-5.


Cyclococcolithina pertusa (Sullivan) Wilcoxen n. comb., = Coccolithus pertusus Sullivan, 1965, Univ. Calif. Publ. Sc. 53, p. 32, pl. 3, figs. 5a, b, 6a, b.


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NOTES ON CANCELLARIIDAE (MOLLUSCA: GASTROPODA) — II

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OCEAN DRIVE BEACH, SOUTH CAROLINA

This is the second of a series of papers dealing with various aspects of the gastropod family Cancellariidae (Volutacea). In this paper one new genus is described, together with two new species from the Tertiary of the southeastern United States and two new species of Recent Cancellariidae from the Galápagos Islands. In addition, new names are proposed for two previously described species, one from off the Cape of Good Hope, and the other from Kerguelen Island, southern Indian Ocean.

OLISSONELLA Petit, n. gen.

Type, here designated: Cancellaria smithii Dall, 1888, Recent, Western Atlantic.

Description: Shell scutate, with corded varices, the outer lip arched, internally lirate; columella with two phrenes; shallow anterior notch; umbilical area may be present in varying degrees, differing even in the same species between juvenile and adult specimens; nepticone whorls smooth, polished, about 2 1/2 in number, sutures very deep; aperture ovate-trigonal.

Discussion: Shells of this new genus would appear to be similar in figures to the literature of species of Swelletta Cossmann, 1889, of the Eocene of Europe, but actual compari-

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son shows many differences, the primary distinction being the scaleate form of Olssonella, its deeper sutures and the invariable presence of spiral cords.

The following species are considered to belong to Olssonella:

Olssonella vokeae Petit, n. sp. (Silverdale, North Carolina; early lower Miocene).

Cancellaria desmotis Gardner, 1937 (U. S. Geol. Surv. Prof. Paper 142-F, p. 373, pl. 45, fig. 5; Chipola Formation, Florida; late lower Miocene).

Cancellaria bifolia Alrich, 1903 (Nautilus, v. 16, p. 101, pl. 4, fig. 24; Oak Grove Sand, Florida; late lower Miocene).

Cancellaria (Trigonostoma) sphenostoma Gardner, 1937 (U. S. Geol. Surv. Prof. Paper 142-F, p. 376, pl. 45, figs. 11, 12; Shoal River Formation, Florida; middle Miocene).

undescribed species (Gatun Formation, Canal Zone; middle Miocene).

Cancellaria scalatella Guppy, 1873 (Proc. Sci. Assoc. Trinidad, v. 2, p. 78, pl. 2, fig. 4; Bowden Formation, Jamaica; upper Miocene).

Trigonostoma thsbe Olsson, 1964 (Neogene Moll. Northwestern Ecuador, p. 126, pl. 22, fig. 6; Esmeraldas Formation, Ecuador; Mio-Pliocene).
species cf. smithii Dall (Waccamaw Formation, South Carolina; Pliocene).

Cancellaria smithii Dall, 1888 (in Agassiz, Three Cruises of Blake, p. 70, fig. 292; Recent, Western Atlantic).


Trigonostoma campbelli Shasky, 1961 (Veller, v. 4, p. 20, pl. 4, fig. 5; Recent; Panamic-Pacific).

These southeastern U. S., Panamic, and Jamaican fossils, and the Recent (North Carolina to Gulf of Mexico) O. smithii (Dall), with the two Recent Panamic-Pacific species form a compact, well-defined group. Olssonella vokesae has only a faint umbilical chink, as does the type of the new genus. In the Miocene of Florida there are species that are openly umbilicate, as are the two Recent Panamic-Pacific species O. funiculata (Hinds) and O. campbelli (Shasky).

The genus is named for Mr. Axel A. Olsson, who has contributed so much to our knowledge of the Tertiary faunas of the Americas, and who is responsible for the writer's interest in Tertiary Mollusca.

**Olssonella vokesae** Petit, n. sp.

*Plate 1, figs. 1a, 1b*

**Diagnosis:** Protoconch smooth and large in proportion, of 2½ whorls. Aperture and spire equal in length. Whorls moderately convex, with impressed suture. Sculpture consisting of strong rounded axial ribs, numbering ten on the body whorl, crossed by about sixteen evenly spaced spiral cords, which rise over the axials. Spiral cords at the shoulder; intermediate, weaker cords in interspaces in some specimens. Aperture semi-lunate, the outer lip well rounded, lirate within, with about nine lirations. Columellar pillar straight, with two plaits of equal size, the lower one descending. Umbilical chink present.

Dimensions of holotype: height 8.4 mm; diameter 4.6 mm.

**Holotype:** USNM 646465.

**Type locality:** TU 562, "Silverdale Beds," Onslow County marl pit, on south side of Webb Creek, near Silverdale, Onslow County, North Carolina.

**Occurrence:** Known only from the type locality.

**Figured specimen:** USNM 646465 (holotype).

**Discussion:** This new species, based on a unique specimen collected by Dr. Emily H. Vokes, appears to be ancestral to Cancellaria smithii Dall of the Recent Western Atlantic, as well as other related species in the Tertiary of the southeastern United States and Caribbean, and the Tertiary and Recent of the Panamic-Pacific.

**Charcolleria Olsson, 1942**

*Type, by original designation: Cancellaria (Charcolleria) perdiciana Olsson, 1942, Mio­cene, Colombia.*

**Charcolleria distinguentada Petit, n. sp.**

*Plate 1, figs. 2a, 2b*

**Diagnosis:** Shell fusiform, high-spired, aperture slightly longer than apex. Protoconch smooth, glassy, with about 3½ whorls. Whorls convex, suture impressed, with smooth concave depressions at the shoulder. Below the shoulder, on the body whorl, about fourteen strong, evenly spaced spiral cords, a few having intermediate weaker cords. Axial sculpture of rounded ribs, numbering about 20 on the body whorl, in general evenly spaced, but obliterated in places by evident stages of rapid growth. The spiral cords cross the axial ribs forming small nodes at the intersections. Aperture elongate-oval, produced into a short anterior canal, strongly lirate within, with about fourteen lirations. Columella with two folds, the posterior one being larger, and the anterior one descending. Umbilical chink-like.

**Dimensions of holotype:** height 20.5 mm; diameter 10.8 mm.

**Holotype:** USNM 646466.

**Type locality:** TU 546, Chipola Formation, Ten Mile Creek, about 1½ miles west of Chipola River (NE 3/4 Sec. 12, TIN, R10W), Calhoun County, Florida.

**Occurrence:** Known only from the type locality.

**Figured specimen:** USNM 646466 (holotype).

**Discussion:** In generic characters, this species is almost intermediate between Charcol­leria and Massyla H. and A. Adams, 1854 (Type: Cancellaria corrugata Hinds, Recent, Panamic-Pacific). In Massyla the predomi­nant sculpture is spiral, with little if any axial sculpture, the suture is less impressed, and the shell is not openly umbilicate. Though *C. distinguentada* is not openly umbilicate, a strong umbilical chink is present, and the spire is much more acute than in Massyla. Charcolleria distinguentada is easily distinguished from Massyla venusta (Tuomey and Holmes, 1856), Massyla propevenusta (Mansfield, 1930), and other Massyla by its acute spire. *C. distinguentada* differs from all
Cossmann has yet to be determined. Shell morphology is quite similar, but *Admetula* is characterized by the presence of one or more pronounced varices per whorl. This species has been named for Mrs. Jacqueline DeRoy, who collected the first specimens to come to the writer's attention. These had been sent to Mr. Anthony D'Attrilio, who donated them to the American Museum of Natural History, which in turn made them available for study. Of these specimens, and ones later sent to the writer by Mrs. DeRoy, the holotype and paratype remain in the American Museum of Natural History, N. Y., a paratype has been deposited in the United States Natural Museum, (no. 679557) and paratypes remain in the writer's collection.

Four additional specimens were made available for study from the Allen Hancock Foundation collection, which is on loan to the Los Angeles County Museum of Natural History. These bear catalogue numbers AHF 195-34, AHF 201-34, AHF 170-34, and AHF 147-34. I am indebted to Dr. James H. McLean for making these specimens available for study. In addition to Mrs. DeRoy and Dr. McLean, I am also indebted to many others for lending material and for other favors. Among those are: William K. Emerson and William E. Old, Jr. of the American Museum of Natural History, Myra Keen, of Stanford University, Dr. Wilson of the U. S. Geological Survey, and Axel A. Olsson of Coral Gables, Florida. They have all contributed materially to the description of this species, and to other phases of the present study of the Cancellariidae.

**Cancellaria Lamarck, 1799**

*Type, by monotypy: Voluta reticulata* Lin&éf, 1758, Recent, North Carolina to Gulf of Mexico.

**Cancellaria Darwini** Petit, n. sp.

*Plate 1, figs. 4a, 4b, 4c*

*Diagnosis:* General shape as figured. Protoconch bulimoid and rather large, of three smooth, glossy whorls, the last large, convex, the first or apical one very small, the coil slightly inclined to the axis and set off sharply from the sculptured first nepticone whorl. Aperture and spire about equal in length. The last whorl moderately convex, the suture distinct. Sculpture faintly cancellate, consisting of numerous weak axial ribs and very narrow spiral cords,
the spirals rising into sharp nodes over the axial.

Thirteen spirals between the suture and the anterior canal. Spiral intervals quite wide and plain. Aperture semilunate, the outer lip rounded, inclined, deeply lirate within, with about eight lirations. Columellar pillar straight, with three plates, the upper strongest. Aperture white; surface color yellowish white, the spiral cords brown.

Dimensions of holotype: Height 18.7 mm; diameter 10.3 mm.

Holotype: American Museum of Natural History no. 154677.

Type locality: 170-200 meters depth, south of Academy Bay, Isla Santa Cruz, Galápagos Islands.

Occurrence: Known only from the Galápagos Islands.

Figured specimen: American Museum of Natural History no. 154677 (holotype).

Discussion: This species is easily distinguished from all other eastern Pacific Cancellariidae by its evenly spaced, brown spiral ridges on the cream colored surface. This is a curious species, sculptured and colored much like a *Littorina*. The narrow spiral cords contrast sharply with the background color of the shell. *Cancellaria darwini* is nearest to *C. decussata* Sowerby and *C. gemmulata* Sowerby, but cannot be confused with either due to the aforementioned unique coloration. It is doubtful that this species will remain in *Cancellaria* s.s. when the family is better understood.

All known specimens of *C. darwini* were dredged by Mrs. Jacqueline DeRoy, Isla Santa Cruz, Galápagos Islands. Paratypes have been deposited in the Stanford University collection and in the U. S. National Museum. Other paratypes remain in the Petit collection.

The following two names are preoccupied. Therefore, new names are here proposed.

**Zeadmete watsoni** Petit, nom. nov.


This Magellan species was figured by Watson (1886, pl. 18, fig. 9). The type locality is Royal Sound, 28 fathoms, Kerguelen Island. It has since been reported from the Falklands and Tierra del Fuego at depths of 95–210 meters (Carcelles, 1950, p. 64; Carcelles and Williamson, 1951, p. 304).

Type: BM(NH) 1887.2.9.943.

**Cancellaria africana** Petit, nom. nov.


Not *Cancellaria imbricata* Hornes, 1856, Die Fossilen Mollusken des Tetzthier-Beckens von Wien, v. 1, Univalves, p. 327, pl. 35, fig. 16.

This species was taken from Challenger Station 142, 150 fathoms, off the Cape of Good Hope. It was figured by Watson (1886, pl. 18, fig. 10). There is no question about this species being a cancellarid, but it cannot be placed in *Cancellaria* s.s. Until more

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**PLATE 1**

**Figures**

1. *Dissorhina yokotesae* Petit, n. sp. (× 6)
   
   USNM 646465 (holotype); height 8.4 mm, diameter 4.6 mm.
   

2. *Charcolleria distinguenda* Petit, n. sp. (× 3)
   
   USNM 646466 (holotype); height 20.5 mm, diameter 10.8 mm.
   
   Locality: TU 546. Chipola Formation, Florida; lower Miocene.

3. *Agatrix deroyae* Petit, n. sp. (× 3)
   
   AMNH 154676 (holotype); height 15.9 mm, diameter 10.7 mm.
   
   Locality: Isla Santa Cruz, Galápagos Islands, 150 meters.

4. *Cancellaria darwini* Petit, n. sp. (× 3)
   
   AMNH 154677 (holotype); height 18.7 mm, diameter 10.3 mm.
   
   Locality: Isla Santa Cruz, Galápagos Islands, 170–200 meters.

(In all figures except 4c the specimen is whitened to show details of ornamentation.)
is known about the relationships within this family, it cannot with certainty be placed in any named genus. Barnard (1958, p. 13) stated that "although Watson said the aspect of the shell suggested an Admete, the presence of a radula shows that he placed the species in the correct genus." The presence of a radula, as the family is presently understood, serves only to separate Cancellaria from Admete, and does not offer, per se, any assistance in placement within the complex of Cancellaria s.l.

Type: BM(NH) 1887.2.2.940.

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NOTES ON THE FAUNA OF THE CHIPOLA FORMATION—III
TWO NEW SPECIES OF VASUM (MOLLUSCA: GASTROPODA), WITH COMMENTS ON VASUM HAITENSE (SOWERBY)

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When the writer (Vokes, 1966) published a monograph on the genus Vasum in the western Atlantic there were two species of Vasum known from the Chipola Formation of northwestern Florida. Since then, additional collecting has revealed two new species in this formation, plus many more and better examples of one of the previously described forms, Vasum haitense (Sowerby). The second described form, V. chipolense Vokes, remains a mystery, with no new material being discovered in spite of extensive additional collecting. Since 1966, collections from 26 new Chipola localities have been added, plus much more material from previous localities. Ironically, the two new species are from one of the oldest known Chipola sites, the "One mile west of Bailey's Ferry, on Ten Mile Creek" (USGS 2212) of Dall and Gardner. One of the most fascinating aspects of the Chipola fauna is its incredible variety. Every collecting trip adds a number of new species and this particular place is one of the richest and most exciting of all of the pres-