NEW SPECIES OF EOCENE MOLLUSCA FROM THE GULF COAST

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ALEXANDRIA, LOUISIANA

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ILLUSTRATIONS

I. ABSTRACT

Two genera and eight species of gastropods and one bivalve species from the middle and upper Eocene of the Gulf Coast embayment are described as new. The new monotypic genus *Sablea* is the first Eocene assignment within the family Lepetellidae and *Eodaphne*, a new genus in the subfamily Daphnellinae of the family Turridae, is the earliest reported occurrence of a true daphnellid decussated protoconch.

II. ACKNOWLEDGMENTS

The writer gratefully acknowledges the assistance and cooperation of the following persons: David Dockery III, Jackson, Mississippi, for the contribution of specimens; Gerhard Bakker, Los Angeles City College, for excellent illustrations; Harold E. and Emily H. Vokes, Tulane University, for photography and assistance with plate preparation. Special thanks are due Katherine V. W. Palmer, Paleontological Research Institution, and Harold E. Vokes, Tulane University, for critical review of the manuscript. Their comments and suggestions have been most helpful.

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III. SYSTEMATIC DESCRIPTIONS

Phylum MOLLUSCA
Class GASTROPODA Cuvier, 1797
Subclass PROSOBRANCHIA
Milne-Edwards, 1848
Order ARCHAEOGASTROPODA Thiele, 1925
Suborder PATELLINA von Ihering, 1876
Superfamily COCCULINACEA Thiele, 1909
Family LEPETELLIDAE Dall, 1881
Genus SABLEA, n. gen.

Type species: *Sablea minuta*, n. sp., upper Eocene, Southern United States.

Diagnosis: Shell minute, patelliform, cap-shaped, bilaterally symmetrical. Muscle scar horse-shoe shaped, broadest at anterior ends, open anteriorly. Anterior opening connected by pallial line, impressed in adult specimens, obscure or wanting in immature shells. Apex blunt, posterior in position and curved posteriorly. Aperture narrowly elliptical. Margin not in a single plane, elevated at both ends. Sculpture of growth lines only.

Discussion: This curious little shell is somewhat difficult to place since it combines features of several families. It seems to fall most naturally within the Lepetellidae as it has characters of three genera in that group. It combines the saddle-shaped margins of *Tectisumen* Finley, 1927, the blunt, posteriorly placed apex of *Addisonia* Dall, 1882, and the narrow oval aperture of *Cocculinella* Thiele, 1909. It differs from those genera

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by having the impressed pallial line connecting the anterior ends of the muscle scar.

The genus is named for my patient and understanding wife, Sable S. Allen.

Sablea minuta Allen, n. sp.
Plate 2, figs. 1-9

Description: Characters as enumerated for the genus and as figured. Anterior slope convex, posterior slope concave. Nucleus not retained. Apex in posterior third of length in mature specimens, not overhanging margin. Shell thin and fragile in juvenile specimens, much thickened in the adult form.

Holotype: PRI 27639.

Dimensions: Length 2.05 mm; width 1.2 mm; height 1.5 mm.

Paratype A: PRI 27640.

Dimensions: Length 1.7 mm; width 1.0 mm; height 1.15 mm.

Paratype B: Author's collection, length 1.6 mm; width .95 mm; height (incomplete) 1.05 mm; not figured.

Type locality: Red River below Montgomery Landing, Grant Parish, Louisiana.

Paratype C: PRI 27641.

Dimensions: Length 3.5 mm; width 1.75 mm; height 2.25 mm.

Locality: Mouth of Saline Bayou, St. Maurice, Winn Parish, Louisiana.

Occurrence: Middle Eocene, Cook Mountain Formation, Saline Bayou Member, Claiborne Group. Upper Eocene, Moodys Branch Formation (type), Jackson Group.

Discussion: Material available for study in the preparation of this paper consisted of the holotype, an apparently mature individual, two juvenile specimens designated paratypes A and B from the type locality, and one adult specimen from St. Maurice, designated paratype C. In addition to being larger, paratype C differs in two minor features from the holotype. The pallial line is less deeply impressed and the apex is placed relatively more posteriorly.

Examination of the immature specimens shows the apex to be subcentral. Apparently during growth the animal added shell material anteriorly at a more rapid rate than posteriorly with the result that the older specimens have the apex placed progressively more posteriorly. This theory agrees with the slight difference in the location of the apex of two apparently adult individuals of different size as noted above.

This report, so far as is known to the writer, constitutes the first record of the family Lepetellidae below the Miocene.

Order Mesogastropoda Thiele, 1925
Superfamily Cyclophoracea Gray, 1847
Family Viviparidae Gray, 1847
Genus Viviparus Montfort, 1810

Type species by original designation: *V. fluviorum* Montfort (= *Helix vivipara* Linnaeus, 1758) [= *Paludina* Lamarck, *in* Férussac, 1812]. Recent, Europe.

Viviparus erronis Allen, n. sp.
Plate 1, figs. 1-2

Description: Shell of about three and one-half whorls, protoconch and outer lip broken. First one and one-half whorls convex with decreasing convexity thereafter. Body whorl flattened below suture with obscure angulation at base. Sutures deeply impressed. Inner lip slightly reflexed over umbilical area leaving a narrow open slit. Aperture higher than wide. No ornamentation except obscure growth lines.

Holotype: PRI 27642.

Dimensions: Height (incomplete) 18 mm; width 14 mm.

Type locality: Red River below Montgomery Landing, Grant Parish, Louisiana.

Occurrence: Upper Eocene, Moodys Branch Formation, Jackson Group.

Discussion: Since specific differences in this group are largely a matter of degree it is difficult to make comparisons. *V. erronis* seems to be closest to the Paleocene species *V. leai* Meek and Hayden (White, 1883, p. 467, pl. 27, figs. 10-14), from which it differs by having a less convex body whorl, a more elongate aperture and much more deeply impressed sutures.

This species, known only from the type specimen, is noteworthy only by the fact of its occurrence in an otherwise exclusively marine fauna, and it must surely be a vagrant as the name implies. The only other specimen of the genus known from the southern or eastern Eocene is Lyell's specimen [*Viviparus ? lyelli* (Conrad) 1865, p. 32] from the Jackson Group of North Carolina, which is a cast and of somewhat questionable generic identification.

Suborder Taenioglossa Troschel, 1848
Superfamily Calyptraeacea Lamarck, 1809
Family Capulidae Férussac, 1821
Genus Capulus Montfort, 1810

Type species by original designation: *Capulus hungaricus* = *Patella ungarica* Lin-

naeus. Recent: Europe, North America; Miocene-Pleistocene, Europe.

CAPULUS CASSIS Allen, n. sp.
Plate 1, figs. 3-4

Description: Muscle scars typical of the genus. Shell dome-shaped, flared at the margins. Protoconch spiral, minute, posterior to midline and situated behind the apex. Sculpture of growth lines with a few obscure radial striations at the posterior margin. Aperture broadly oval.

Holotype: PRI 27643.

Dimensions: Length (incomplete) 15 mm; width 13 mm; height 6 mm.

Type locality: Red River below Montgomery Landing, Grant Parish, Louisiana.

Occurrence: Upper Eocene, Moodys Branch Formation, Jackson Group.

Discussion: *C. cassis* does not closely resemble any species known to the writer. The domed-shape, regularly flared margins and barely perceptible protoconch will serve to separate it from other Tertiary forms.

The species is known only from the holotype. Although possibly an unseemly comparison, to the writer this shell instantly recalls the helmet worn by a French 'poilu' during World War I.

Superfamily TONNACEA Suter, 1913
Family CYMATIIDAE Iredale, 1913
Genus COLUBRARIA Schumacher, 1817

Type species by monotypy: *Colubraria granulata* Schumacher (= *Murex maculosus* Gmelin). Recent, Philippines.

COLUBRARIA VOKESAE Allen, n. sp.
Plate 2, figs. 10-11

Description: The holotype seems to be an immature specimen but the adult characters are well shown. Small for the genus. Shell consists of about five whorls; slender with elongate body whorl. Nucleus of three whorls; the first depressed making the apex blunt, the following two rapidly enlarging, smooth, bulbous. Fully developed adult sculpture begins abruptly, consisting of close set, narrow axial ribs crossed by flat spirals, eight on the whorls of the spire, weakly nodular at the intersections. Spaces between spirals crowded by microscopic threads that cross the axial ribs and varices. Varices are narrow but strong, rising above the sutures and occurring every ⅔ whorl after initiation of the adult sculpture. Varix at aperture set behind outer lip. Axial ribs become obsolete anteriorly on body whorl. Aperture narrow, one-half total shell height; this proportion, however, may be due to the immaturity of the specimen. Outer lip weakly and irregularly denticulate at inner edge. Parietal shield elevated to form a collar that is horizontally striated on the outer face. Canal short, recurved at termination. Columella slightly keeled at canal with one weak oblique plait above.

Holotype: PRI 27644.

Dimensions: Height 5 mm; width 2 mm.

Type locality: Red River below Montgomery Landing, Grant Parish, Louisiana.

Occurrence: Upper Eocene, Moodys Branch Formation, Jackson Group.

Discussion: This constitutes the first report of the genus from the southern Eocene. Tucker and Wilson (1932, p. 49, pl. 8, figs. 3, 4; 1933, p. 70, pl. 11, fig. 14) figured two species from Florida Neogene formations but neither are close to *C. vokesae*. In particular the small size and large bulbous nuclear whorls will serve to separate these species.

Known only from the holotype.

Named for Emily H. Vokes, Tulane University, who has been an unfailing source of help.

Order STENOGLOSSA Bouvier, 1887
Superfamily BUCCINACEA Latreille, 1825
Family FASCIOLARIDAE Chenu, 1859
Genus LATIRUS Montfort, 1810
Subgenus POLYGONA Schumacher, 1817

Type species by monotypy: *Polygona fusiformis* Schumacher (= *Murex infundibulum* Gmelin). Recent, West Indies.

LATIRUS (POLYGONA) VOKESI Allen, n. sp.
Plate 1, figs. 5-7

Description: Shell fusiform, slender, medium-sized, anomphalous. Aperture small, canal elongate, oblique, anterior end missing. Total of about eleven whorls including four and one-half in elevated nucleus. First two and one-half nuclear whorls smooth, conical; succeeding two whorls with axial ribs becoming increasingly coarse to the beginning of the adult sculpture. Adult sculpture of seven prominent swollen axial ribs crossed by three strong spirals with a fourth weaker spiral added on later whorls just above the suture. The primary spirals increase in strength as they cross the ribs. Secondary spirals consist of three strong threads in each interspace, the middle one slightly more prominent. The secondary spirals begin on the first post-nuclear whorl as a single thread, a second is added and by the end of the third post-nuclear whorl the three threads are visible, which persist through the body whorl. Sutures slightly impressed, sinuous. The axial ribs are interrupted at the sutures giving the appearance of a deep sutural area. A noticeable feature of the

sculpture is that the successive axial ribs do not reach the position of the corresponding ribs in the whorl immediately above so that each line of ribs forms a receding curve down the spire.

Edge of outer lip lamellar, the rim scalloped by the spirals, inner margin fluted. Parietal callus heavy, slightly separated at edge along canal. A small tooth or constriction at the beginning of the canal is set well inside aperture. Columella with three plaits of approximately equal strength. Parietal ridge at posterior end of aperture.

Holotype: PRI 27645.

Dimensions: Height (incomplete) 17.5 mm; width 7.5 mm.

Type locality: Mouth of Saline Bayou, St. Maurice, Winn Parish, Louisiana.

Occurrence: Middle Eocene, Cook Mountain Formation, Saline Bayou Member, Claiborne Group.

Discussion: *Latirus vokesi* is closest to another Claiborne species, *L. sexcostatus* Johnson, particularly a mature specimen such as figured by Palmer (1937, pl. 54, fig. 3). *L. vokesi* may be distinguished by the three strong primary striations that are present from the first post-nuclear whorl, while a third is present only on the later whorls of *L. sexcostatus*. Additionally, as noted above, the ribs of *L. vokesi* form a descending, receding line while those of *L. sexcostatus* are in alignment on the whorls of the spire.

The nuclear whorls of *L. vokesi* are of particular interest in that there are two complete whorls with curved riblets prior to the beginning of the adult sculpture, (see Pl. 1, fig. 7). The common condition within the genus is the presence of a few such ribs for one-half whorl or less. This form, therefore, varies in this respect from any other southern Eocene species, and in fact from any species that has come to this writer's attention.

Named for Harold E. Vokes, Tulane University, to whom all paleontologists in this field owe a tremendous debt for his monumental work on bivalve nomenclature.

Family TURRIDAE Swainson, 1840 (emended)
Subfamily TURRINAE Powell, 1942
Genus SINISTRELLA Meyer, 1887

Type species by subsequent designation, Cossmann, 1896; *Triforis americanus* Aldrich, 1885. Eocene, southern United States.

SINISTRELLA MEYERI Allen, n. sp.
Plate 2, figs. 12-15

Description: Shell sinistral, small, turreted, solid. Whorls about nine, including a smooth mammillated nucleus of one and one-half to two whorls. Primary sculpture consists of two spiral cords; one subsutural, the second and strongest just below the center of the whorls. Secondary spirals are added on later whorls, generally a strong thread below the center carina and a third cord just above the suture. Body whorl has eight to ten spiral cords with occasional intermediate threads. Strong growth lines on the body whorl behind the aperture incise and dominate the spirals in that area. Sutures linear, indistinct on the early whorls. Aperture narrowly ovate, canal short and oblique. The outer lip is not entire in any specimen seen but it seems to be sharp as in the type species. Plications within outer lip set back from edge. Sinus shallow, set on the primary central carina.

Holotype: PRI 27647.

Dimensions: Height 12.5 mm; width 4.5 mm.

Paratype: PRI 27648.

Dimensions: Height 10.5 mm; width 4 mm.

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PLATE 1

Figures

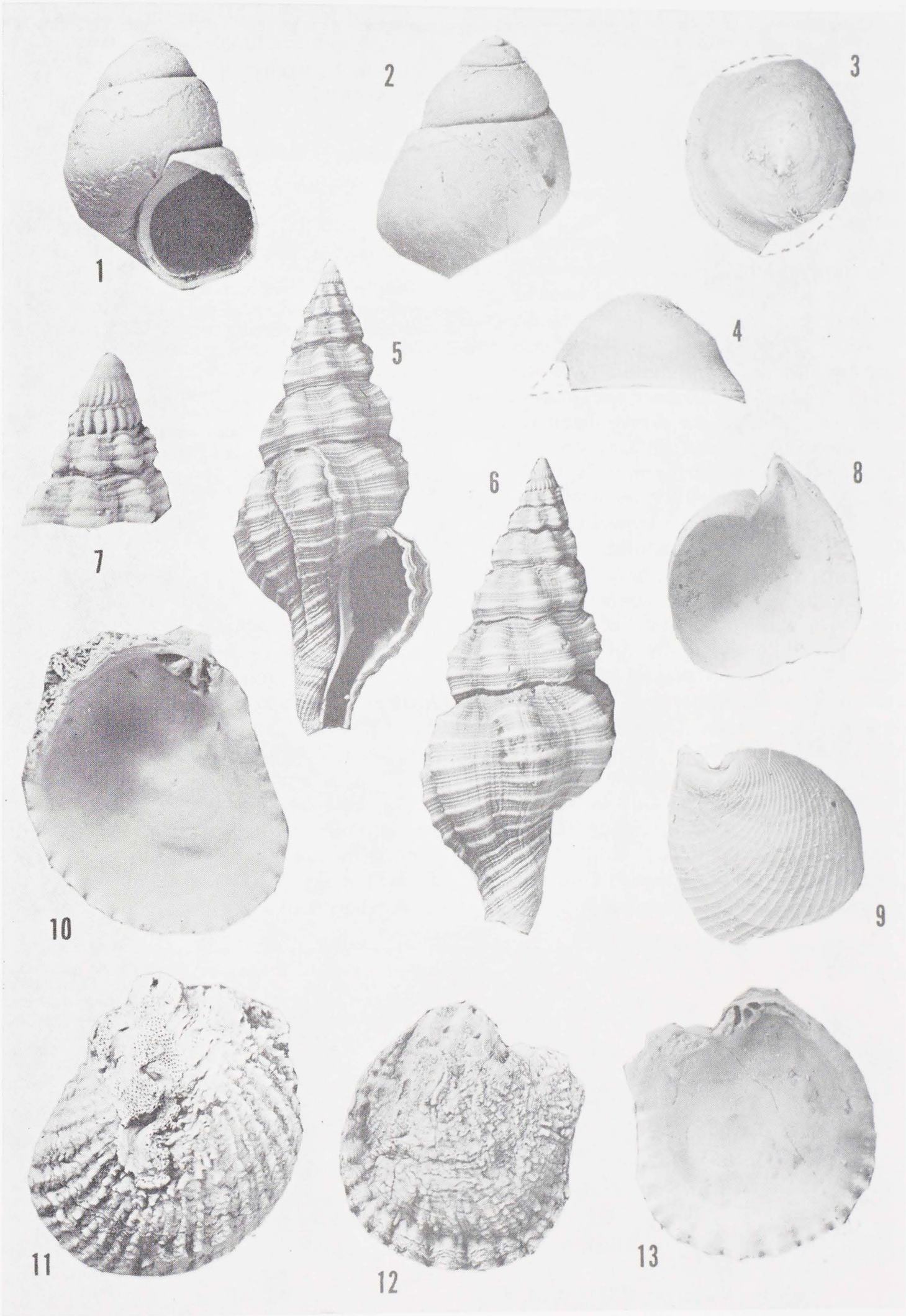

PLATE 1

Type locality: Red River below Montgomery Landing, Grant Parish, Louisiana.

Occurrence: Upper Eocene, Moodys Branch Formation, Jackson Group.

Discussion: This addition of a second species to the genus should serve to strengthen the validity of the genus described by Meyer which some authors have felt was merely a sinistral *Trypanotoma*.

S. meyeri differs from *S. americana* in the character of the spiral ornamentation. *S. americana* has a wide beaded or nodular central carination that usually becomes binodular within a few whorls. *S. meyeri* has one central smooth cord that is much more narrow. The whorls of *S. americana* are excavated at their base, making the suture distinct. This condition is not present in *S. meyeri*.

An examination of the sinus is, to the author, the most interesting point of comparison. Meyer's statement, "Obwohl ein eigentlicher Sinus nicht vorhanden ist, - - - - -", (1887, p. 18) in his description of the genus is technically correct but somewhat misleading. In a perfect specimen of *S. americana* the sinus, as indicated by the growth lines, although shallow, is readily apparent and is centered on the upper half of the central binodular carination. The subcentral cord on the whorls of *S. meyeri* is equal in position to the lower half of the binodular spiral of *S. americana*. Since the sinus of *S. meyeri* is set on that subcentral cord the relative location of the sinus differs slightly in the two species, although identified in both with the primary peripheral carination.

Named for Otto Meyer, the author of the genus, who made important contributions to Gulf Coast paleontology near the end of the last century.

Subfamily DAPHNELLINAE Hedley, 1922

Genus EODAPHNE, n. gen.

Type species: *Eodaphne powelli*, n. sp., upper Eocene, southern United States.

Diagnosis: Shell minute. Protoconch multispiral, rapidly enlarging with succeeding whorls becoming increasingly convex. First whorl bulbous, translucent. Succeeding nuclear whorls decussated with tendency to nodulation at the intersections of the oblique threads. Adult sculpture consists of spiral threads; the first strong spiral below the suture forms a weak shoulder on the whorls of the teleconch. Sinus sutural, occupying the shoulder area which is weakly concave. Body whorl convex below the sinus, anterior canal moderately long, slightly curved.

Discussion: *Eodaphne* has an unmistakable daphnellid protoconch and sinus. It appears to be intermediate between *Daphnella* Hinds, 1844, and *Cryptodaphne* Powell, 1942. It is separated from *Daphnella* by the primary adult sculpture which consists solely of spiral threads. The protoconch and spiral ornamentation are closer to *Cryptodaphne* from which it is separated by the absence of a strong keel on the teleconch, lack of constricted aperture and the sinus, although deeper, is not as wide. The shoulder of *Eodaphne* occupies much less space on the body whorl than in *Cryptodaphne*.

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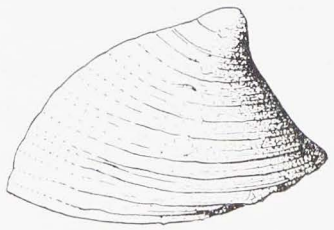
PLATE 2

Figures — Page



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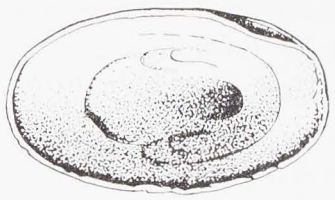

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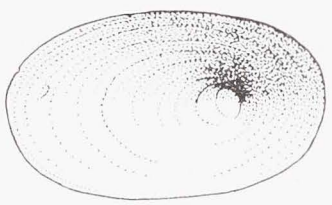

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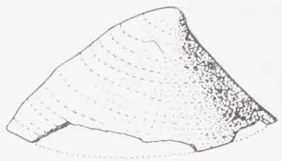

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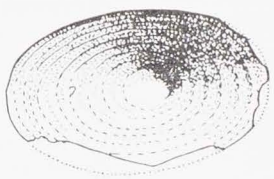

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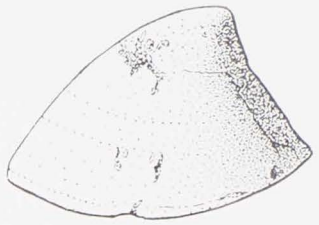

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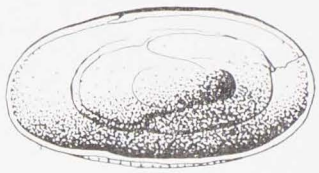

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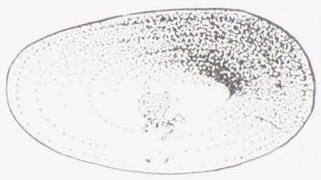

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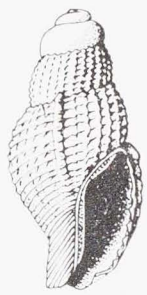

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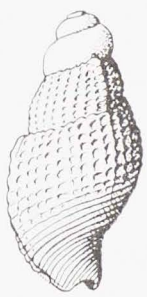

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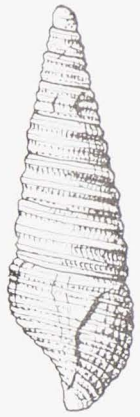

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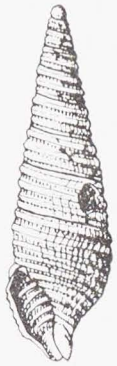

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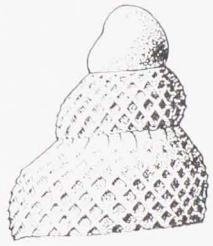

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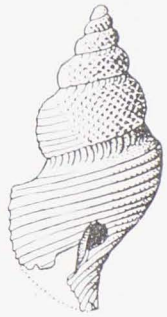

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PLATE 2

EODAPHNE POWELLI Allen n. sp.

Plate 2, figs. 16-18

Description: Characters as enumerated for the genus and as figured. Shell consists of about six whorls of which five constitute the nucleus. First one and one-half whorls are bulbous, translucent and microscopically granular. Succeeding three and one-half whorls decussated by oblique threads, nodular at the intersections. The sinus is visible on the last two nuclear whorls and is marked by a slight concavity below the suture. Adult sculpture begins abruptly without any varix or other demarcation. Ornamentation consists of flat, irregularly placed spiral threads with wider interspaces that are minutely granulated. Sinus area marked with growth lines only. Sutures linear, somewhat obscured by the sinus. Outer lip and end of canal broken. Anterior canal moderately long. Aperture less than one-half total shell height. Shell thin and fragile.

Holotype: PRI 27649.

Dimensions: Height (incomplete) 2.3 mm; width 1.2 mm.

Type locality: Red River, South of Montgomery Landing, Grant Parish, Louisiana.

Occurrence: Upper Eocene, Moodys Branch Formation, Jackson Group.

Discussion: Recent species within the subfamily Daphnellinae are numerous and widely distributed with several genera represented in American waters. It is, therefore, somewhat surprising that the fossil record should be so incomplete. One possible conclusion, as noted by Powell (1942, p. 173), is that it is a lately developed family, although his comment applied only to the New Zealand fauna.

At present the Gulf Coast Eocene is represented by three species: *Daphnella gregorioi* (Cossmann), *Daphnella imperita* Harris, and *Daphnella quindecima* Harris (Harris, 1937, pp. 74-75: pl. 13, figs. 7-10; Palmer and Brann, 1966, pp. 628-629); all from the middle Eocene, Claiborne Group. All three, however, lack the diagonally cancellated protoconch of *Daphnella s.s.* and should be reinvestigated in the light of later classification of the Turrinae.

Eodaphne powelli represents, so far as is known to the writer, the first report of the occurrence of the true daphnellid protoconch below the Miocene. This new species is known only from a single, apparently immature specimen.

Named for A. W. B. Powell, Auckland Institute and Museum, New Zealand, to honor his outstanding work on the Turridae.

Subclass OPISTHOBRANCHIA

Milne-Edwards, 1848

Order TECTIBRANCHIATA Cuvier, 1817

Suborder CEPHALASPIDEA Fischer, 1883

Superfamily PHILINACEA Fischer, 1883

Family PHILINIDAE Fischer, 1883

Genus PHILINE Ascanius, 1772

Subgenus MEGISTOSTOMA Gabb, 1864

Type species by monotypy: *Megistostoma striata* Gabb (= *Bullacea gabbiana* Stoliczka). Middle Eocene, California.

PHILINE (MEGISTOSTOMA) DOCKERYI

Allen, n. sp.

Plate 1, figs. 8-9

Description: Shell broadly ovate, thin and fragile. Aperture large with widely expanded outer lip. Posterior extremity of outer lip produced with strong convexity in the umbilical area. Anterior margin broadly rounded. Spire concealed by callus pad. Callus on inner lip irregularly striated longitudinally, strongest anteriorly.

Holotype: PRI 27650.

Dimensions: Height to apex (incomplete) 14 mm; maximum width 14.5 mm. The holotype was broken during photography.

Type locality: Riverside Park behind swimming pool, Hinds County, Jackson, Mississippi.

Occurrence: Upper Eocene, Moodys Branch Formation, Jackson Group.

Discussion: The holotype does not exhibit any scars but one specimen in the author's collection shows a deep muscle attachment scar near the margin of the outer lip just below the mid-line. This character must be highly variable within the species as it seems to be within the genus.

Sculpture of concentric, elevated, twin striae similar to the type species of the subgenus, *M. gabbianum* (Vokes, 1939, Pl. 17, figs. 1-3), which it most closely resembles. *M. dockeryi* may be distinguished by its more conspicuous ribs and much wider interspaces.

Named for David Dockery III, Jackson, Mississippi, the collector.

Class BIVALVIA* Linnaeus, 1758

Subclass PTERIMORPHIA Beurlen, 1944

Order PTERIOIDA Newell, 1965

Suborder PTERIINA Newell, 1965

Superfamily PECTINACEA Rafinesque, 1815

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* Bivalve nomenclature after Vokes, 1967.

Family PLICATULIDAE Watson, 1930

Genus PLICATULA Lamarck, 1801

Type species by subsequent designation, Gray, 1841, *Plicatula gibbosa* Lamarck (= *P. ramosa* Lamarck). Recent, West Indies.

PLICATULA CREOLA Allen, n. sp.

Plate 1, figs. 10-13

Description: Shell medium in size, ovate to nearly circular in shape, strongly inflated. Attachment area medium, covering about one-third of the lower valve in the holotype, a right valve. Hinge structure normal for the genus and quite strong. Sockets in the right valve indicate that the cardinals of the left valve are the larger and diverge at such an angle that separation of the two valves without damage would be difficult or impossible. This is borne out in that both hinge teeth are broken in the two left valves available for study. Lower valve more or less regularly inflated, shallower near the posterior and ventral margins but without a flattened marginal area. Margins weakly folded. Upper valve has a strongly inflated central disk with flattened, strongly folded margins. Posterior margin of left valve alated. Adductor muscle scars prominent, posterior to center line. Pallial line simple, not impressed. External sculpture consists of sharp, narrow, radial ribs with larger interspaces. Scales on ribs minutely spinose, strongest dorsally. Central disk of upper valve exhibits typical but weaker fine ribbing over most of surface, becoming coarser at the flattened marginal areas.

Holotype: Right valve, PRI 27651.
Dimensions: Height 22.5 mm; width 20 mm.
Paratype: Left valve, PRI 27652.
Dimensions: Height 19 mm; width 18.5 mm.

Type locality: Red River, South of Montgomery Landing, Grant Parish, Louisiana.

Occurrence: Upper Eocene, Moodys Branch Formation, Jackson Group.

Discussion: *P. creola* does not closely resemble any known American form of *Plicatula*. The fine ribbing and strong inflation separates it from other Eocene species of the genus. The sculpture somewhat resembles *P. filamentosa planata* Aldrich (Harris, 1919, pl. 12, fig. 17) but is stronger and more regular and *P. creola* has no trace of the internal radii that are the trademark of *P. filamentosa* stock.

Named after the type locality, which was once known as Creole Bluff.

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SPHENASTER, NEW GENUS, A PLIOCENE CALCAREOUS NANNOFOSSIL FROM THE TROPICAL INDO-PACIFIC

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I. Abstract

A distinctive new calcareous nannoplankton taxon from the early Pliocene interval of a tropical Indo-Pacific deep-sea core is described as a new genus and species, *Sphenaster metula*.

II. Introduction

During a study of Pliocene calcareous nannoplankton from a series of tropical Indo-Pacific deep-sea cores, collected by the Scripps Institution of Oceanography, a previously undescribed taxon has been observed to occur consistently in the early Pliocene interval. Other authors may have referred to it previously as *Sphenolithus* sp. or *Sphenolithus* cf. *S. abies* in samples of the same age. Description of this new form is based on study with the light microscope and the transmission and scanning electron microscopes. The types are temporarily deposited in the collections of Chevron Oil Field Research Company, La Habra, California. Appreciation is expressed to Dr. Helen Tappan Loeblich for critical reading of the manuscript.

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Plate 1

Figures

1-8 *Sphenaster metula* Wilcoxon, n. sp. (Figs. 1-4 from light microscope, Figs. 5-8 from transmission electron microscope), (1) plan view, × 2700, (2) crossed nicols, (3) plan view, × 5400, (4) crossed nicols, (5) tilted specimen, × 18,000, (6) distal view of specimen between rays of discoaster, × 12,000, (7) distal view of specimen with central hole plugged, × 18,000, (8) distal view of specimen with central hole open, × 16,000.