On Some New Lower Eocene Mollusca from Clarke Co. Alabama, with Some Points as to the Stratigraphical Position of the Beds Containing Them

Author(s): Angelo Heilprin

Source: *Proceedings of the Academy of Natural Sciences of Philadelphia,* Vol. 32 (1880), pp. 364-375
Published by: Academy of Natural Sciences
Stable URL: http://www.jstor.org/stable/4060696
Accessed: 06-09-2017 06:45 UTC

ON SOME NEW LOWER EOCENE MOLLUSCA FROM CLARKE CO. ALABAMA, WITH SOME POINTS AS TO THE STRATIGRAPHICAL POSITION OF THE BEDS CONTAINING THEM.

BY ANGELO HEILPRIN.

The following species of fossil mollusca, for which I am indebted to Dr. Eugene A. Smith, State Geologist of Alabama, were obtained from sections exposed in that State on Knight's Branch and Cave Branch, tributaries of Bashia Creek (Clarke Co.), and from Wood's Bluff on the Tombigbee River, near the mouth of Bashia Creek, and some twenty-eight miles north of St. Stephen's. They occur in probably the oldest marine tertiary deposits of the State, and occupy a horizon nearly parallel with that which is characterized by the fossils of Upper Marlborough and Piscataway River, Maryland, and Pamunkey River, Virginia. The following enumeration of fossils from the three localities first named, will best illustrate the palæontological relations of the beds containing them toward each other, and to the various Eocene deposits of the Atlantic and Gulf slopes:

Fossils from Knight's Branch.

Astarte tellinoides, Conr. (*Var. A. sulcata*, Lea.)
Cytherea perovata, Conr.
Cytherea Nuttalliopsis, Heilpr. sp nov.
? *Cardita alticosta* (*Blandingi*), Conr.
Corbula rugosa, Lam.
(*C. oniscus*, Conr; *var. C. gibbosa*, Lea.)
Ancillaria (*Ancillopsis*) *subglobosa*, Conr.
Natica ætites, Conr.
Turbinella (*Caricella*) *Bandoni*, Deshayes, sp.
(*Voluta Bandoni*, Desh.)
Lævibuccinum lineatum, Heilpr. sp. nov.
Rostellaria (*Calyptrophorus*) *trinodifera*, Conr.
Solarium cupola, Heilpr. sp. nov.
Fusus interstriatus, Heilpr. sp. nov.
Fusus sub-tenuis, Heilpr. sp. nov.
Fusus (*Strepsidura*) *subscalarinus*, Heilpr. sp. nov.
Tornatella (*Tornatellæa*) *bella*, Conr.
Ostrea.
Cylicosmilia.

Fossils from Cave Branch.

Dentalium micro-stria, Heilpr. sp. nov.
Natica ætites, Conr.
Natica Mississippiensis, Conr.
Pyrula multangulata, Heilpr. sp. nov.
Pyrula tricostata, Desh.
Turritella carinata, Lea.
Solarium cupola, Heilpr. sp. nov.
? *Pleurotoma acuminata*, Sowerby.
Pleurotoma moniliata, Heilpr. sp. nov.
Cassidaria (fragment). Closely allied to *C. carinata*, Lam.
Voluta (*Athleta*) *Tuomeyi*, Conr.
Fusus pagodiformis, Heilpr.
Fusus interstriatus, Heilpr. sp. nov.
Fusus subtenuis, Heilpr. sp. nov.
Fusus (*Strepsidura*) *subscalarinus*, Heilpr. sp. nov.
Leda protexta, Conr.
Cardium (*Protocardia*). Young of *C. Nicolleti*? Conr.
Ostrea (same species as from Knight's Branch).

Fossils from Wood's Bluff.

Dentalium micro-stria, Heilpr. sp. nov.
Natica limula, Conr.
Pyrula multangulata, Heilpr. sp. nov.
Turritella carinata, Lea.
Solarium cupola, Heilpr. sp. nov.
Solarium delphinuloides, Heilpr. sp. nov.
Cancellaria evulsa, Brauder, sp.
(*C. tortiplica*? Conr.)
Pleurotoma (*Cochlespira*) *cristata*, Conr.
Pleurotoma, n. sp.
Ancillaria (*Ancillopsis*) *subglobosa*, Conr.
Pseudoliva vetusta, Conr.
Pseudoliva scalina, Heilpr. sp. nov.
Voluta (*Athleta*) *Tuomeyi*, Conr.
Fusus pagodiformis, Heilpr.
? *Fusus* (*Levifusus*) *trabeatus*, Conr.
Fusus interstriatus, Heilpr. sp. nov.
Fusus, n. sp.
? *Cardita alticosta* (*Blandingi*), Conr.
Leda protexta, Conr.

Pecten Poulsoni, Morton.
Ostrea (species different from that of Knight's Branch and Cave Branch.)

From an examination of the above tables it will be seen that a fair proportion of the fossils from Knight's and Cave Branches are held in common by both deposits, and therefore there can be no reasonable doubt that they represent about equivalent horizons. Of the hitherto undescribed forms *Cytherea Nuttalliopsis* and *Lævibuccinum lineatum* appear to have been obtained only at the former, and *Pleurotoma moniliata* at the latter locality, although it is highly probable that further investigation will reveal their mutual presence in both localities. The described American forms are mainly those occurring at various heights on the Claiborne exposure. A comparison of these forms with those obtained by Tuomey (First Biennial Report of the Geology of Alabama, p. 146) from the Bashia Creek sections near Choctaw Corner, shows the two groups to be of a contemporaneous age, for from bed No. 2 of that section Prof. Tuomey obtained (among others) species of "*Ostrea*, *Cytherea*, *Cardita*, *Cardium*, *Rostellaria*, *Actæon*, *Voluta*, *Infundibulum*, and *Solarium*," which appear to have been identical with the species obtained by Dr. Smith from the two localities above mentioned.[1]

[1] The species enumerated by Tuomey are *Ostrea compressirostra*, *Cardita planicosta*, *Rostellaria velata*, *Actæon pomilius*, *Voluta Sayana?* *Cardium Nicolleti*, and *Infundibulum trochiformis*. The specimens appear to have been submitted to Mr. Conrad, who considered the determinations of Tuomey as, at least in part, imperfect, and substituted the following specific names (*Am. Journ. Science*, new series, xl, p. 266): *Ostrea Carolinensis* (species from the Santee Canal, South Carolina), *Volutilithes* [*Athleta*] *Tuomeyi* (described by Conrad [Proc. Acad. Nat. Sciences, vi, p. 449] in 1853 from Bashia Creek), and *Protocardia Virginiana?* The following remark in pencil occurs in the volume of Toumey's Reports, contained in the library of the Academy: "All doubtful except *Venericardia planicosta*. T. A. Conrad." Tuomey's *Rostellaria velata* and *Actæon pomilius* were in all probability *Rostellaria trinodifera* and *Tornatella bella*, which would better agree with the descriptions of obviously the same fossils as given in Hale's report (C. S. Hale: The Geology of South Alabama, Am. Journ. Science, new series, vi, p. 355).

SECTION ON BASHIA CREEK.

1	Hard Limestone.	4 feet.
2	Marl, highly fossiliferous.	25 feet.
3	Blue Sand.	Variable.
4	Lignite and Clay.	6 feet.
5	Laminated Clay, Sand and Mud.	Thickness undetermined.
6	Lignite.	Thickness undetermined.

(Tuomey: First Biennial Report, p. 145.)

NOTE.—Beds 5 and 6 do not properly belong to the section, but "represent beds seen on another part of the stream below the preceding." (*Loc. cit.* p. 146.)

The fossils from Wood's Bluff, some 15 miles W. of Choctaw Corner, were obtained by Dr. Smith from a bed of indurated green sand rising about 10–15 feet above water line, which bed may possibly represent the lowermost portion of bed No. 2 of the Bashia section. Some support is given to this view by the circumstance that at this point—Wood's Bluff—the basal lignite (which in the above named section has a thickness of 6 feet) has disappeared, and more especially (at least, as showing it to possess a distinctive character) by the general facies of the representative molluscous fauna. Although there exists a close similarity between the general assemblage of its fossils and those of the two "Branches" of Bashia Creek, yet the number of peculiar forms is considerably greater, and consequently the aggregate possesses a much more decided individuality than obtains with either of the deposits in question. Moreover, I am informed by Dr. Smith that the fossil fauna of Knight's and Cave Branches corresponds most closely with that of bed No. 4[1] of the Wood's Bluff section, an aluminous deposit about 21–26 feet above water level, and containing species of *Dentalium*, *Tornatella*, *Solarium*, *Turritella*, and *Rostellaria* identical with forms from the two first named localities. The disappearance of the basal lignites at Wood's

[1] Section as yet unpublished, but communicated by letter to the author.

Bluff may be accounted for on the supposition that they have dipped under, which would be in harmony with what we know concerning the dip of the beds in this region. This is but locally or at best, but partially indicated in Tuomey's reports, but judging from the contour lines of the cretaceous formation on the general maps appended to the first and second Reports, and from the north and south sections on the map of 1849, as well as from the facts obtained in Mississippi, it must be in a direction west of the southern line, or in other words, S. by W. Dr. Smith has found the loss by dip in a southerly direction on the Tombigbee River to be about 10 feet to the mile, which accords well with Hilgard's observations on the Upper Eocene and Oligocene formations of Mississippi.[1]

From palæontological evidence alone the three exposures in question might readily be taken to represent rather an Upper than a Lower Eocene horizon, for in addition to the species typical of the American Middle Eocene, or Claiborne group proper (Calcareous Claiborne of Hilgard), and to the new or undescribed forms, we have the following which have not been hitherto recognized as belonging to the formation, and which, on the contrary, were originally described (at least the majority of them) from deposits of newer date.

Caricella (Voluta) Bandoni, Deshayes, sp. (*Animaux s. Vert. br., Bassin de Paris,* II, Pl. 102, figs. 13 and 14), from the "calcaire grossier," Middle Eocene of most geologists, Upper Eocene of Judd. Knight's Branch.

Natica Mississippiensis, Conrad (J. A. N. S. 2d series, i, p. 114), originally described from the Vicksburg (Oligocene) group, but also found in the Jackson (Upper Eocene) deposits. Cave Branch.

Pleurotoma acuminata, Sowerby (Mineral Conchology, Vol. ii, p. 105), from the London Clay of Highgate (Lower Eocene of most geologists, Middle Eocene of Judd), and Barton clay (Upper Eocene)? (I have had no specimens of this species with which to institute direct comparisons, but from a careful examination of Sowerby's and Edwards' figures and descriptions there appear to me to be no justifiable grounds for separating the species figured on Pl. 20, fig. 10, from its European ally. Cave Branch.

Pyrula tricostata, Deshayes (*Coquilles Fossiles,* ii, p. 584), from Rétheuil and Cuise-Lamothe, Middle Eocene (Suessonian of d'Orbigny). Cave Branch.

[1] Hilgard found the dip of the Jackson and Vicksburg strata to be from 10 to 12 feet per mile S. by W., at "points where the great regularity of succession for a considerable distance seemed to indicate a normal configuration." (A. J. Science, new series, xliii, p. 36.)

Pecten Poulsoni, Morton (Synopsis Org. Rem. Cret. Group, p. 59), a companion of *Orbitoides Mantelli,* Mort. sp., and, according to Hilgard, an *essentially* Vicksburg (Oligocene) fossil. Wood's Bluff.

Cancellaria evulsa, Sowerby [*Buccinum evulsum,* Brander] (Miner. Conchol., iv, p. 84), from the Barton clay (Upper Eocene) of England, and Grignon ("Calcaire grossier") of France.[1] Wood's Bluff.

Pleurotoma (Cochlespira) cristata, Conr. (J. A. N. S., 2d ser. i, p. 115), originally described from the Vicksburg group, but doubtful whether differing from the *Pleurotoma bella,* Conr., from the Upper Eocene of Texas. Wood's Bluff.

In addition to the above, there is among the fossils from Wood's Bluff an immature *Cardium* (*Protocardia*), which may possibly represent the young of *C. Nicolleti* (Jackson group), with which it agrees in outline and general ornamentation, or that of *C. Virginiana*, Conr. (Pamunkey River), an undescribed species, but of which a labeled specimen is in the collections of the Academy. The absence of asperulations on the posterior slope of the specimen in question, however, rendering it uncertain whether they were ever present, or whether they are merely abraded or waterworn, allows of no absolute specific determination.

Whatever may be the palæontological facies of the deposits in question, however, there can be no reasonable doubt as to their true position, since Dr. Smith, as he informs me, has traced bed No. 6 (or the uppermost bed immediately underlying the stratified drift) of his Wood's Bluff section to the mouth of Witch Creek, about 2 miles below on the Tombigbee River, where its relation to the overlying "Buhrstone" is made manifest in an exposure just beyond the mouth of the creek. White Bluff, about 250 to 275 feet in height, beautifully exhibits the white siliceous clay stones and silicified shells so characteristic of the southern Buhrstone formation. These occupy the uppermost portion of the bluff, and make up fully 100 feet of its vertical height; the intermediate portion extending to the water's level, is mainly composed of laminated lignitic clays, with occasional intercalated beds of pure lignite. It becomes manifest from what has just been stated that the fossiliferous beds of Wood's Bluff (*et conseq.* the equivalent deposits on Knight's and Cave Branches and Bashia Creek) must be between 150 and 200 feet below the *base* of the Buhrstone

[1] A very closely allied species, the *Tritonium(!) paucivaricatum* of Gabb, occurs in the Téjon group (Upper Cretaceous—Eocene?) of California, associated with *Cardita planicosta* and other characteristic forms of Tertiary fossils.

(Siliceous Clairborne of Hilgard) formation, or what has hitherto been considered as the base of the Eocene formation in South Carolina. Allowing a uniform southerly dip of 10 feet to the mile, these same beds must be about 250 to 280 feet below the "bed of green sand" mentioned by Tuomey (1st Biennial Report, p. 148) as occurring at Baker's Bluff, a few miles above St. Stephens, (stated to be "rich in organic remains, identical with the fossils of Claiborne") and which, immediately above St. Stephens (Tuomey, *loc cit.*, p. 149), dips beneath the water-line. This approximate determination of position agrees closely with the observations made in the northeastern portion of the county, for Dr. Smith found by actual barometric measurements that the "chalk hills" (Buhrstone) near Lower Peach Tree on the Alabama River, and at a locality about 7 to 8 miles south of Choctaw Corner, were about 250 feet above Knight's and Cave Branches, and the marl bed (No. 2) of Tuomey's Bashia section.

Whether these older Eocene deposits underly the bluff at Claiborne has not yet been proved, but it is but fair to presume that they do. Likewise, it remains to be shown what relation the basal lignite on Bashia Creek bears to the "Northern Lignite" of Hilgard.

CYTHEREA, Lam.

Cytherea Nuttalliopsis, n. sp. Pl. 20, fig. 1.

Shell sub-elliptical, moderately ventricose, its surface covered with fine concentric striæ, which are apt to become roughly imbricate on the basal margin; umbones not very prominent, rather anterior; lunule cordate, deeply impressed at about its middle, its outline clearly pronounced by a sharply impressed line; posterior extremity regularly rounded, the anterior somewhat produced; margin entire; pallial sinus somewhat angular, pointing toward the centre of the shell.

Length, $1\frac{1}{2}$ inch. Knight's Branch, Clarke Co., Ala.

This species most resembles among American species of *Cytherea* the *C. Nuttalli*, Conr., from which it may be distinguished by the greater production forward of the anterior extremity, and by the median depression in the lunule. In this last character it agrees with *C. Poulsoni*, Conr., from which, however, it very materially differs in form, and in the much lesser development of the umbones.

PSEUDOLIVA, Swainson.

Pseudoliva scalina, n. sp. Pl. 20, fig. 12.

Shell bucciniform, of about seven volutions; the whorls roughly plicated; the folds on the body whorl appearing as shoulder nodules; dentiferous sulcus well pronounced, followed by about five impressed revolving lines, which slightly crenulate the margin of the outer lip; revolving lines on the body-whorl above the sulcus almost obsolete; aperture slightly exceeding the spire in length; columella callous; suture deeply channeled.

Length, 1½ inch. Wood's Bluff, Clarke Co., Ala.

LÆVIBUCCINUM, Conra.

(Amer. Jour. Conchol., i, p. 21. Genus not characterized.)

Shell having the general form of *Metula*, H. & A. Adams, but destitute of all traces of a posterior canal; aperture between bucciniform and fusiform, about the length of the spire. This genus is distinct from *Buccinanops* of d'Orbigny, under which the *Buccinum* (*Lævibuccinum*) *prorsum*, Conr., is erroneously classed in the *Prodrome de Paléontologie*, ii, p. 369.

Lævibuccinum lineatum, n. sp. Pl. 20, fig. 5.

Shell fusiform, of about seven convex volutions, which are throughout their whole extent covered by fine, but distinct, revolving lines; aperture slightly exceeding the spire in length, sub-canaliculate anteriorly; columella gently arcuate; outer lip striate within.

Length, 1 inch. Knight's Branch, Clarke Co., Ala.

This species mainly differs from the *L. prorsum*, Conr., in having the revolving lines equally distinct over the entire surface of the whorls. The *Murex* (*Fusus et Buccinum auct.*) *mitræformis* of Brocchi, from the Oligocene and Miocene deposits of France, Austria, and Italy, is a closely related species.

FUSUS, Lamarck.

Fusus subtenuis, n. sp. Pl. 20, fig. 4.

Shell fusiform, of about seven sub-angular volutions; whorls ornamented with somewhat obscure longitudinal folds, about twelve on the body-whorl, which are cut by several prominent revolving ridges commencing at the shoulder angulation; shoulder of the whorls more or less smooth, with an obscure median revolving line, and a prominent sub-sutural one; aperture about the length of the

spire, or slightly exceeding it, the canal gently curved, moderately contracted, and somewhat expanding at the extremity; outer lip thin, and showing internally the external ornamentation; base with numerous revolving lines, which alternate in coarseness.

Length, $1\frac{1}{4}$ inch. Knight's Branch; Cave Branch, Clarke Co., Alabama.

Fusus interstriatus, n. sp. Pl. 20, fig. 11.

Shell fusiform, slender, composed of about ten convex volutions, the first three of which are smooth; whorls ornamented with both longitudinal plications and revolving lines, the last of which (about eight in the upper whorls) alternate with finer intermediate striæ; the longitudinal plications distinct on the earlier whorls, but becoming much less so on the body-whorl, and the one preceding; aperture about the length of spire; the canal somewhat tortuous; outer lip thin, dentate within.

Length, 2 inches. Knight's Branch; Cave Branch, Clarke Co., Alabama.

Subgenus HEMIFUSUS?

Fusus (Hemifusus?) engonatus, n. sp. Pl. 20, fig. 8.

Shell turreted, of about ten volutions, the first three whorls smooth and convex, the remainder strongly carinated, and traversed by numerous fine revolving lines, which on the median portion of the body-whorl alternate with intermediate finer striæ; body-whorl impressed immediately below the carination (shoulder angulation); lines of growth sinuous, and approximating the characteristic lines of the Pleurotomidæ; aperture considerably exceeding the spire in length; columella slightly arcuate, and presenting a rudimentary fold at about its central portion.

Length, $1\frac{1}{3}$ inch. Wood's Bluff, Clarke Co., Ala.

This species resembles the *Fusus bifasciatus* of Deshayes (*Animaux sans Vertèbres, Bassin de Paris*, II, pl. 84, figs. 15 and 16) from the Paris basin, but may be readily distinguished from that species by its more slender form.

Subgenus STREPSIDURA, Swainson.

Fusus (Strepsidura) subscalarinus, n. sp. Pl. 20, fig. 7.

Shell somewhat bucciniform, whorls about eight, sub-angular, the first three or four smooth, the remainder ornamented with both longitudinal costæ and revolving striæ, the latter showing a

tendency to alternate in size; the costæ are arcuate, not in a regular continuous series, those on the body-whorl extending considerably below the middle of the whorl; aperture about the length of spire, the canal somewhat reflected; columella covered with a callous deposit, considerably twisted; outer lip dentate within.

Length, 1 inch. Knight's Branch; Cave Branch, Clarke Co., Alabama.

This species greatly resembles the *Fusus scalarinus* of Deshayes (*Coquilles Fossiles*, II, p. 574, Pl. LXXIII, figs. 27 and 28), but may be distinguished by the lesser prominence of its costæ, and by the presence of well defined striæ over the entire surface of the whorls. In this last respect, as well as in the subangulated form of the whorls, it also differs from the *Fusus scalariformis*, Nyst (*Coquilles et Polypiers Fossiles*, p. 504, Pl. XL, figs. 5a, 6), from Lethen, Belgium.

TURBINELLA, Lamarck.

Subgenus CARICELLA, Conrad.

Turbinella (Caricelia) Bandoni, Deshayes, sp. Pl. 20, fig. 15.

The large species of *Caricella* from Knight's Branch agrees so closely with the figures of *Voluta Bandoni*, Desh. (*Animaux sans Vertèbres, Bassin de Paris*, II, pl. 102, figs. 13 and 14), from the Paris basin, that I do not feel justified in considering it a distinct species. The American form appears to have been somewhat more elevated, but this is probably no more than a varietal circumstance.

Length, 4 inches. Knight's Branch, Clarke Co., Ala.

PLEUROTOMA.

Pleurotoma moniliata, n. sp. Pl. 20, fig. 9.

Shell fusiform, elevated, of about eight volutions, the whorls considerably contracted above the shoulder; whorls ornamented with a double series of nodes, the lower much the most strongly developed, which gives to the upper portion of the spire a moniliform appearance; surface of entire shell traversed by fine revolving lines, which become more distant, very prominent, and alternate on the median portion of the body-whorl; aperture about the length of spire; the relative position of the upper and lower nodes corresponds to the sinuous lines of growth.

Length, 1 inch. Cave Branch, Clarke Co., Ala.

Pleurotoma acuminata? Sowerby. Pl. 20, fig. 10.

(Mineral Conchology, II, p. 105.)

Shell fusiform, acuminate, of about nine volutions; whorls flattened, longitudinally plicated and traversed by fine revolving lines, which become crowded on the concave upper portion of the whorls, and alternate on the basal portion of the body-whorl; suture bordered inferiorly by an elevated line, which is somewhat crenulated by the sinuous lines of growth; aperture less than one-half the length of shell.

Length, 1 inch. Cave Branch, Clarke Co., Ala.

This *Pleurotoma* corresponds very closely with the descriptions and figures of *P. acuminata* as given by Sowerby in the "Mineral Conchology," and by Edwards in his monograph of the English Eocene mollusca (Palæontographical Society Reports, 1854, p. 230, pl. xxvii, figs. 3*a*, *b*, *c*, *d*), and will probably prove, on direct comparison, to be referable to that species.

PYRULA, Lamarck.

(*Ficula,* Swainson.)

Pyrula multangulata, n. sp. Pl. 20, fig. 2.

Shell elongated, sub-claviform; apex of spire obtuse, consisting of three smooth volutions; whorls about seven, covered with revolving striæ, which are very fine on the upper portion and shoulder of the body-whorl, but less so and attenuate on the basal portion; body-whorl occupying about three-fourths of the entire shell, marked by two prominent and one lesser carinæ, and a single row of crenulations on the shoulder angulation; the fourth whorl (the first one bearing ornamentation) appears cancellated; columella curved.

Length, 1 inch. Cave Branch; Wood's Bluff, Clarke Co., Ala.

Pyrula tricostata, Deshayes. Pl. 20, fig. 6.

(Coquilles Fossiles, ii, p. 584, Atlas, Pl. 79, figs. 10 and 11.)

Although I have no specimen of *Pyrula tricostata* for direct comparison, I have, nevertheless, but very little hesitation in referring the Alabama form above figured to the same species, as it agrees in all essential respects with the figures and descriptions of that form as given by Deshayes in the *Coquilles Fossiles.* Three unnamed specimens of a *Pyrula* in the Academy collection from Dax, France, which I believe to be the *P. clava* (Oligocene?) of Basterot, somewhat resemble the Alabama species, but are

comparatively much more robust, and have the costal nodes and revolving striæ considerably more developed.

SOLARIUM, Lamarck.

Solarium cupola, n. sp. Pl. 20, fig. 14.

Shell convexly conical, mound-like, of about five volutions; whorls ornamented with alternating coarse and very fine concentric lines, and appearing double from a medial impression (the shell apparently of twice the number of volutions that it actually possesses); base similarly ornamented as the upper surface, convex, and strongly margined by the prolongation inferiorly of the outer wall; umbilical margin finely crenulated, the umbilicus broadly open, and exhibiting the concentrically striated internal volutions of the apex; aperture rhomboidal.

Length, $\frac{2}{3}$ inch; diameter, $1\frac{1}{4}$ inch. Cave Branch; Knight's Branch; Wood's Bluff, Clarke Co., Ala.

Solarium delphinuloïdes, n. sp. Pl. 20, fig. 13.

Shell convexly conical, of about seven volutions; the whorls ornamented with several beaded revolving lines, two or more of which near the upper margin, and one near the basal margin being the most prominently defined; base convex, sub-marginally channeled, and ornamented with numerous finely beaded revolving lines, which become most prominent in the umbilical region; umbilical volutions distinct to the apex, transversely striated, supermedially carinated; umbilical margin crenulated; aperture subcircular.

Length, $\frac{1}{2}$ inch; diameter, $\frac{3}{4}$ inch. Wood's Bluff, Clarke Co., Ala.

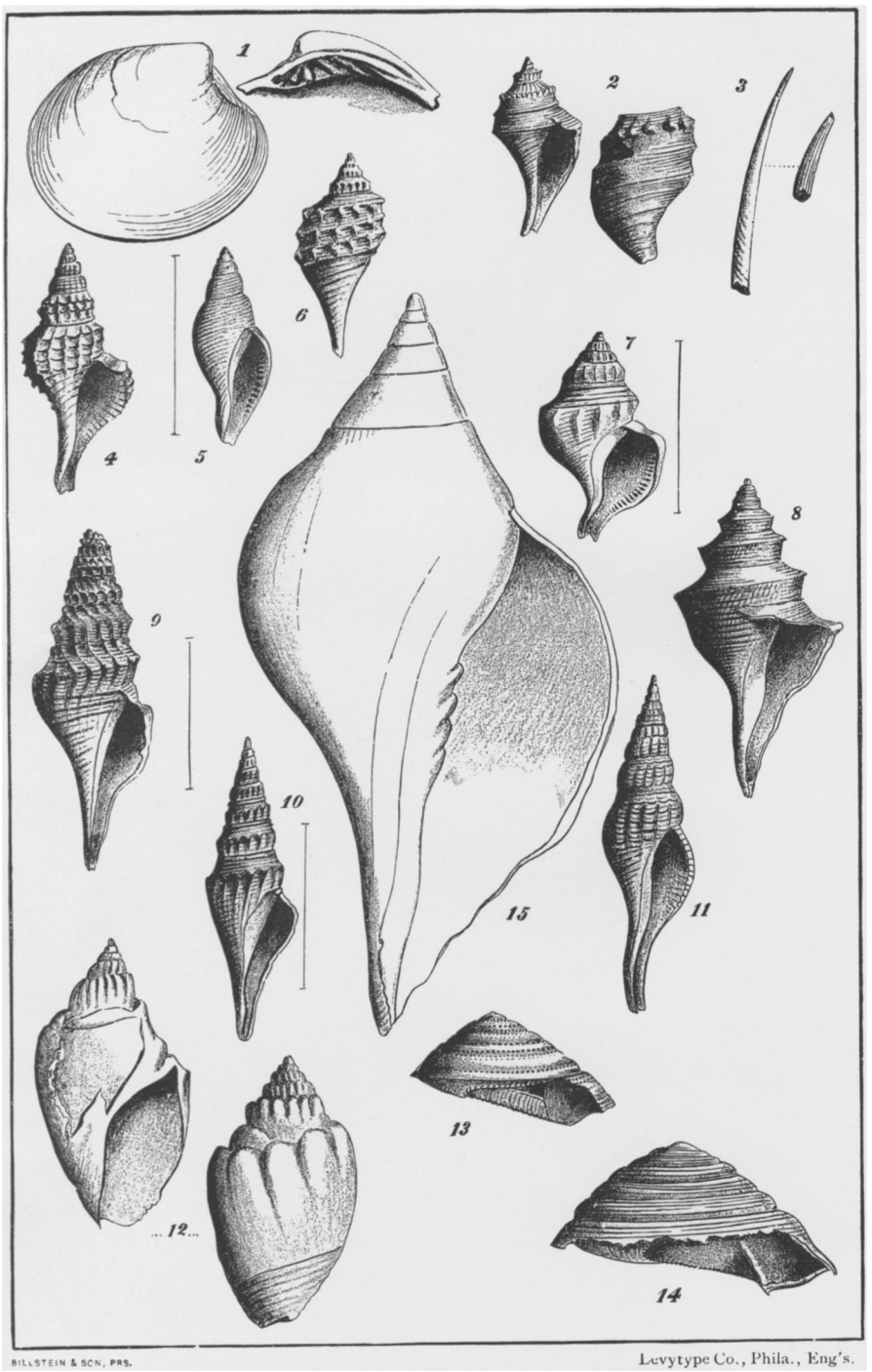
DENTALIUM, L.

Dentalium micro-stria, n. sp. Pl 20, fig. 3.

Shell slender, considerably curved and greatly attenuated, faintly striated, the striæ most conspicuous on the attenuated portion; posterior aperture entire, there being no fissure; anterior aperture circular.

Length, $1\frac{1}{2}$ to 2 inches. Cave Branch; Wood's Bluff, Clarke Co., Ala.

Fusus pagodiformis (*Pleurotoma? pagoda*, Heilpr., Proceedings of the U. S. National Museum, 1880), specific name *pagoda* pre-occupied by Adams and Reeve.



MEILPRIN ON EOCENE FOSSILS.