

PROCEEDINGS

OF THE

ACADEMY OF NATURAL SCIENCES

OF PHILADELPHIA.

PHILADELPHIA.

PRINTED FOR THE ACADEMY:

By Merrihew & Thompson, Merchant street above Fourth.

1856.

Observations on the Eocene deposit of Jackson, Mississippi, with descriptions of thirty-four new species of shells and corals.

By T. A. CONRAD.

The following table will show the order of succession of Eocene groups; but is not pretended to be more than an exposition of my limited knowledge of them, though they are doubtless presented in the true order of superposition. Further research may develop intercalated groups. No. 6, is probably synchronous with the Orbitulite limestone of St. Stephens, Alabama, as its two most prominent fossils are very abundant in this stratum at Vicksburg. No. 5, is the lowest bed exposed in the bank of the Mississippi river, at Vicksburg. Col. Wailes found a large *Ostrea* on the top of the Jackson group, which is probably the shell referred to in No. 5. It would be convenient to designate these sub-divisions thus:—Claiborne group; Jackson group; Vicksburg group; St. Stephens group;

GROUPS OF CHARACTERISTIC FOSSILS.

8.	Crassatella Mississipiensis, Arca Mississipiensis, Meretrix sobrina, M. imitabilis, Turbinella Wilsoni.	} Newer Eocene, Vicksburg.
7.	Corbula alta, Natica.	
6.	Pecten Poulsoni, Orbitulites Mantelli.	
5.	Ostrea Georgiana?	
4.	Umbrella planulata, Cardium Nicolletti, Conus tortilis, Cypræa fenestralis, Galeodia Petersoni, Rostellaria extenta, &c.	} Older Eocene, Jackson.
3.	Crassatella alta, Pectunculus stamineus, Meretrix æquorea, Gratelupia Hydii, Leda cælata, Crepidula lirata, &c.	
2.	Ostrea sellæformis.	} Older Eocene, Claiborne.
1.	Cardita densata. Cyclas ———.	

Alabama river,

Nos. 1 to 3 represent the Claiborne group; 4, Jackson group; 6, the St. Stephens group; 7 and 8, the Vicksburg group. When a group of corresponding fossils is to be found elsewhere, its relative position can be stated by referring to the typical subdivision which contains many identical species.

Since my discovery of the Eocene formation of Claiborne, Alabama, in 1832, by means of fossil shells collected by Judge Tait, numerous localities have been found in the southern States, and characteristic fossils have also been obtained by Major Emory, in Western Texas, and even in California, by Mr. Blake. Localities widely separated contain some species in common, but I did not anticipate that groups would vary to the extent they do in the three localities of Claiborne, Alabama, Jackson and Vicksburg, Mississippi. Col. B. L. C. Wailes, of Mississippi, has lately discovered a new group of Eocene fossils at Jackson, in which none of the Vicksburg species occur; and of forty species, five only are identical with Claiborne fossils. One of the Jackson shells, *Cardium Nicolletti*, Conrad, was first discovered in the bank of Red river, Washita; and, therefore, this latter locality will probably prove to belong to the same division of the Eocene as that of Jackson. The Mississippi deposit described by Col. Wailes, is a group of shells chiefly, of more than ordinary beauty and preservation, imbedded in sand of a gray color, consisting of fine angular grains of quartz and minute fragments of shells. One of the species, *Cypræa fenestralis*, is closely

related to *C. elegans*, of Deshayes; two remarkable species which have no analogue or kindred shell in later Tertiary formations. The state of preservation and the forms of these fossils are closely analogous to those of the Paris basin; and I find no recent nor any Miocene species among them. I believe the group to be newer than the Claiborne deposit, and certainly older than that of Vicksburg.

I think it will be found that No. 6, of the above table, represents that extensive limestone, which, in Alabama, contains the *Basilosaurus* remains; the *Laganum Rogersi*, Morton, near Claiborne, and near Brandon, Mississippi, where it has been discovered by Col. Wailes, occupying a higher position than the Jackson group. The limestone of Jacksonboro', Georgia, described by Lyell, is probably referrible to the same division, and contains the *Laganum Rogersi*, (*Scutella Jonesi*, Forbes.)

The following species of organic remains were collected by Col. B. L. C. Wailes, and are figured in his work on the Geology of Mississippi. Those illustrations are referred to in the descriptions.

CORBULA.

1. *C. densata*, Geol. of Miss. Pl. xiv., fig. 9.—Triangular, subequilateral, very thick in substance; surface undulated and having angular concentric striæ; umbonal slope submarginal and acutely carinated, posterior extremity angular.

Related to *C. nasuta*, Con. but proportionally shorter, thicker, with a more rounded base, &c. The description applies to the larger valve, as I have not seen the opposite one.

2. *C. bicarinata*, Pl. xiv., fig. 3.—Elevated, triangular, slightly oblique, thick in substance, profoundly ventricose, with robust reflected concentric lines; umbo profoundly prominent, and the beak incurved; posterior slope biangulated; space between the angles flattened, direct.

Resembles *C. oniscus*, Con., but is thicker, more elevated, not rostrated, and its slight obliquity is the reverse of that in the former species. I have not seen the smaller valve.

LEDA, Schum.

L. multilinea, Pl. xiv., fig. 4.—Ovato-elliptical, inequilateral, ventricose, with fine sharp concentric lines, which are somewhat undulated; anterior side rostrated, with closely-arranged, radiating, minute, tuberculated striæ; posterior side with unequal fine radiating lines, a few of which are very distinct; a few radiating lines are continued near the base over the middle of the valves.

Allied to *N. calata*, Con., but very distinct.

NAVICULA, Blainville.

N. aspera, Pl. xiv., fig. 5.—Trapezoidal, disk contracted behind the middle, cancellated; concentric lines distant, imbricated; radiating lines largest towards the umbonal slope, subspinous; umbonal slope acutely angulated; posterior slope excavated; series of cardinal teeth uninterrupted; inner margin crenulated.

CARDIUM, Lin.

C. (Protocardia) Niccolletti, Pl. xiv., fig. 6. Proceed. Acad. Nat. Sc., 1841, p. 33.

This shell agrees, except in size, with the specimen originally described from the Washita, and doubtless the beds of that locality will prove to be of synchronous origin with those of Jackson. A species of *Cardium* very nearly allied to this, I formerly believed to be the same; but it accompanies a different group, and presents variations entitling it to be a specific distinction.

It is from Pamunkey river, Virg.

Compared with *C. Niccolletti*; umbo less inflated, posterior margin oblique, shell proportionally longer, and the radiating lines 22; in the other 25. The posterior cardinal tooth larger, &c. It may be named *C. levis*.

CRASSATELLA, Lam.

C. flexura, Pl. xiv., fig. 7.—Trapezoidal, inequilateral; ventricose medially; slightly contracted anteriorly, and more so posteriorly; umbonal slope angulated and prominent; whole surface with concentric prominent lines, some of which bifurcate anteriorly; inner margin crenulated.

Approaches *C. protexta*, Con., but has the striæ over the whole disk, the cardinal teeth more compressed; inner margin with larger crenulations, &c.

GLOSSUS.

G. filiosus, Pl. xiv., fig. 8.—Orbicular, ventricose, with radiating lines, unequal, medially flattened, and towards the ends angulated; concentric lines microscopic, series of cardinal teeth uninterrupted, generally large and prominent.

Allied to *G. stamineus*, Con., but very distinct.

OSTREA, Lin.

O. trigonalis, Pl. xiv., fig. 10.—Triangular, flat, surface irregular, with some indistinct radiating lines; muscular impression obliquely suboval, situated nearer the summit than the base; margin somewhat ascending, submargin carinated.

A single imperfect upper valve is all that I have seen of this shell, but it is widely different from any other Eocene species known to me.

PECTEN, Lin.

P. nuperus, Pl. xiv., fig. 11.—Suborbicular, ventricose, with about twenty-three angular, prominent ribs, crossed by fine closely-arranged wrinkled lines; ears finely striated obliquely.

A single valve with the ears broken is all of this species in the collection.

UMBRELLA.

U. planulata, Pl. xiv, fig. 1.—Suboval, flattened, surface undulated, rising a little towards the apex, which is prominent and acute, and situated much nearer to one side and nearer to one end; lines of growth conspicuous; inner side with a very large suboval cicatrix, with radiating interrupted lines.

This fine species is the only one yet known in North America. Two specimens occur, one of which is marked with some hair-like brown radiating lines, both internally and externally.

CAPULUS, Mont.

C. Americanus, Pl. xv., fig. 1.—Obliquely ovate, longitudinally contracted on one side; lines of growth profound; summit very oblique; apex profoundly prominent, acute, curving towards the base and projecting far beyond the basal margin; aperture obtusely oval or suborbicular.

TROCHITA, Schum.

T. alta, Pl. xv., fig. 3.—Conic, elevated, with three or four transverse undulations; radii prominent, rounded, very irregular, interrupted, somewhat tuberculated; vertex central, spiral, somewhat prominent.

CLAVELLA, Swains. CLAVILITHES, Swains.

1. *C. humerosa*, Pl. xv., fig. 2.—Fusiform, volutions eight? rounded; body whorl and penultimate entire, the others with broad rounded ribs; whorls carinated below the suture and with revolving lines, most prominent towards the apex; body whorl and penultimate, channelled above and contracted near the summit; body whorl angulated inferiorly; beak long and straight.

2. *C. varicosa*, Pl. xvi., fig. 7.—Fusiform, spire and beak elongated; whorls nine, with distant, rounded, thick ribs and with revolving acute lines, which are obsolete or less prominent on the ventricose portion of the body whorl; papillated apex formed of three volutions; columella nearly straight, and with microscopic longitudinal lines.

C. Mississippiensis, Pl. xvii., fig. 8, is probably the same species.

MITRA, Humph. Lam.

Subgenus LAPPARIA, Conrad.

Short-fusiform, spinous; apex papillary; beak very short, thick, twisted; plaits as in Mitra.

M. (Lapparia) dumosa, Pl. xv., fig. 4.—Short-fusiform, volutions seven, direct, obliquely flattened above, with a series of transversely compressed, distant spines on the two largest whorls; on the contiguous whorl they become nodules; two whorls below the apex papillary, smooth; the next two longitudinally ribbed, and the others longitudinally striated or with prominent lines of growth; whole surface with revolving wrinkled lines; plaits four; beak profoundly ridged.

CONUS, Lin.

C. tortilis, Pl. xv., fig. 5.—Ovato-turbinate; spire obtusely conical with the apex exerted, acute; whorls obliquely flattened, with revolving impressed lines and transverse wrinkles, carinated near the base, direct between the carina and suture; lines of growth on body whorl profoundly curved; base with a profound thick fold.

Differs from *C. saurodens*, Con., in having a more prominent and convex spire, in the large twisted callus at base, &c.

ROSTELLARIA, Lam.

1. *R. velata*, Con., Pl. xv. fig. 7. *R. Lamarckii*, Lea, Cont. fig. 164.

2. *R. staminea*, Pl. xvi. fig. 9.—Fusiform, spire elongated, subulate above; whorls fifteen; body whorl slightly concave with fine closely-arranged revolving lines, and obsolete longitudinal undulations; three upper whorls with curved longitudinal acute ribs; the remainder covered with a polished calcareous deposit, and excavated at the suture; body whorl angular on a line with the upper margin of the aperture; labrum thin; beak slightly curved.

This species occurs at Claiborne in great abundance.

VOLUTALITHES, Swains.

1. *V. symmetrica*, Pl. xv., fig. 8.—Subfusiform; with longitudinal acute ribs terminating above in short spines on the body whorl; volutions excavated above, where they are striated but not ribbed; body whorl with raised alternated revolving distinct lines; above the angle they become almost microscopic; suture margined below by a series of small points, and somewhat carinated; plaits three, slender.

Allied to *V. Sayana*, Con.

NATICA, Lam.

N. permunda, Pl. xvi., fig. 2.—Suborbicular; body whorl somewhat excavated near the suture; spire very short; umbilicus very long, profound, with a central broad rounded ridge, and the lower margin subcarinated; columella subrectilinear.

APORRHAI.

Subgenus PLATYOPTERA, Conrad.

Shell with a profoundly expanded labrum which is entire, or without a rostrum, and with the margin very thin and acute.

A. (*P.*) *extenta*, Pl. xvi., fig. 3.—Shell independent of labrum fusiform, with prominent revolving rounded lines and intermediate fine lines, from one to three, and longitudinal microscopic lines; volutions rounded, covered towards the apex with a polished calcareous deposit; labrum within with impressed radiating lines, becoming well marked furrows towards the base.

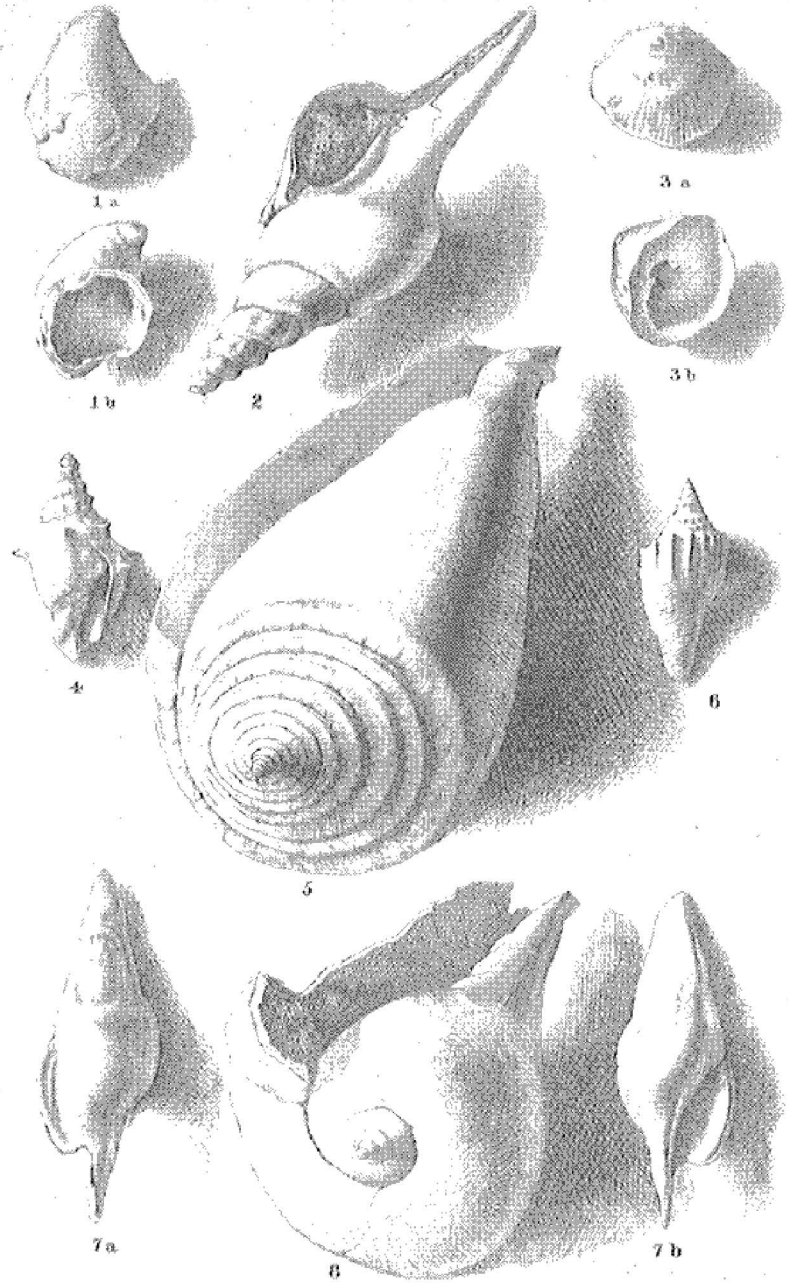
R E P O R T
ON THE
AGRICULTURE AND GEOLOGY
OF
MISSISSIPPI.

EMBRACING A SKETCH OF THE
SOCIAL AND NATURAL HISTORY OF THE STATE.

BY
B. L. C. WAILES,
GEOLOGIST OF MISSISSIPPI;
MEMBER OF THE AMERICAN ASSOCIATION FOR THE PROMOTION OF SCIENCE;
CORRESPONDING MEMBER OF THE NATIONAL INSTITUTE,
AND OF THE BOSTON SOCIETY OF NATURAL HISTORY, ETC. ETC.

PUBLISHED BY ORDER OF THE LEGISLATURE.

E. BARKSDALE, STATE PRINTER.
1854.



Engraved by J. B. Ross and H. P. Smith

JACKSON TERTIARY SHELLS