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NEW EOCENE SPECIES FROM ALABAMA

BY

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PREFACE.

The late Herbert H. Smith, curator of the Alabama State Museum of Natural History University, Alabama, made extensive collections in the Tertiary of Alabama, and at the time of his sudden and lamented death was engaged in classifying and arranging his material. The collections were made on joint account for the Carnegie Museum of Pittsburg and the Alabama Museum of Natural History. The condition of the material made it necessary to go over all of it, and classify it for division as well as to describe what was considered new. The writer has also added a few new species from his collecting. It is regretted that Mr. Smith was not spared to complete his labors, because his ability in specific determinations was almost unique. The types of the new species collected by him are all in the University Museum. We are indebted to Dr. W. H. Dall, Dr. Paul Bartsch, Prof. G. D. Harris and Dr. E. A. Smith for generous aid in both specific and generic determinations of doubtful forms.

New Eocene Species from Alabama

BY

T. H. Aldrich

Mitramorpha turriculata, n. sp. Pl. 1. Fig. 1.

Shell small, biconic, whorls eight, three embryonic and smooth, the fourth with strong longitudinal ribs, which continue over the other whorls, dying down some on the body whorl. Spiral striæ numerous, and impressed, a strong double band bordering the suture, aperture narrow, smooth within. Length 6 mm.

Locality.—Choctaw Corner, Ala. Woods Bluff horizon.

Type.—My cabinet.

Remarks.—This little shell seems to be nearest to *Mitramorpha;* it has a glazed appearance ; there is some evidence of a slight notch on and above the periphery of the body whorl.

Turris (Pleurotoma) nodoideus, n. sp. Pl. 1. Figs. 2, 3.

Shell small, spire pointed, whorls nine ; first four embryonic, the fifth bearing longitudinal ribs in part, and revolving lines in part with the ribs also present but without the subsutural collar below. The sixth, seventh and eighth whorls with the bordering part of the ninth carrying first, a subsutural collar which becomes doubled and thicker towards the body whorl and is marked with very numerous raised lines belonging to the fasciole; second, just below is a rather broad concave revolving space reaching to the peripheral parts of the whorls carrying very numerous close set semicircular anal markings, these continue

over the body whorl in curved raised lines : third, the periphery sometimes carrying a couple of coarse lines followed below by from four to six raised lines, also raised longitudinal ribs from the periphery to suture. Body whorl with raised revolving lines extending to the end of the canal, carrying a few alternating ones below the periphery ; aperture smooth within ; canal slightly rostrate.

Locality.—Cave Branch, 6 miles E. of Thomasville, Ala. Woods Bluff beds.

Type.—Ala. Museum. University, Ala.

Remarks.—This species seems to differ in some respects from any heretofore described, but it may be only a variety of some existing species like *Turris denticula* Bast. *et. al.* The fact is that the Woods Bluff beds at Cave Branch contain so many numerous varieties that it is almost impossible to locate them properly. The whole subject of species in this family needs careful study. The young are often obtuse, and differ in shape and ornamentation from the adult so that they could be called new species, and pass muster while a series would connect them all together. Am not prepared to go into details but hope this subject will be looked into by some of our younger students. Some specimens may be hybrids, and are altogether perplexing. One ought to have authentic specimens of the described species to even begin the examination. All the species of this group from this locality seem somewhat stunted.

Turris specus, n. sp., Pl. 1. Figs. 4, 5.

Shell small, whorls probably seven (the embryonic tip is defective) first three embryonic, then four spiral whorls ornamented with a strong subsutural collar, then a slightly concave revolving fasciolar space covering about one fourth of the whorl, followed by a coarse cancellated surface ; the ribs cut by about four impressed revolving lines making a series of nodes, body whorl with the same ornamentation above followed by coarse revolving lines growing finer to the base ; outer lip smooth inside, columella thickened, base somewhat rostrate.

Locality.—Cave Branch, Ala. Woods Bluff beds.

Type.—Ala. Mus. of Nat. History, University, Ala.

Microdrillia rostratula Csy.

This species described by Col. Casey in 1903 bears a certain resemblance to *Pleurotoma insignifica* Heilpr. (*Fusus nanas* Lea) and has been referred to this species, but specimens before me show differences as follows: Col. Casey says the "body whorls are about four in number." My specimens have five, also in the embryo there is sometimes but one costulate whorl, while *Pleuro. insignifica* Heilpr. has but three embryonic whorls, all smooth, and no costulate ones. The two species seem to be quite distinct. The Texas form mentioned by Prof. Harris is probably the same as Heilprin's species.

SPECIES TO BE ADDED TO THE WOODS BLUFF FAUNA—FROM CAVE BRANCH, ALA.

Exilia pergracilis Con.
Cylichna deKayi Lea.
Cancellaria alveata Con.
" *costata* Lea.
Pasithea guttula Lea (H. H. Smith).
Cancellaria panones Harris.
Ancillaria subglobosa Con.
Levifusus suteri Aldr.
Caricella dolita Con.
Drillia lonsdalii Lea.
Barnea alatoidea Aldr.
Diplodonta nana Lea.
Egerella subtrigonia Lea.
Tellina leana Dall.

Turris bimoniatus, n. sp. Pl. 1. Fig. 6.

Shell small, whorls probably ten, spire on the type partially missing. Another specimen shows four embryonic smooth whorls. The four spiral whorls and part of the fifth ornamented with curved sinuosities covering the main part of the whorls, a

strong collar below the sutures, the balance showing a double collar with a concave space between ; the whole of the surface with numerous spiral raised lines. Aperture about a third of the length of shell, lines on the base have a tendency to alternate. Length 14 mm.

Locality.—Cave Branch, Ala. Woods Bluff beds.

Type.—Ala. Museum, University, Ala.

Remarks.—This seems to combine the characteristics of two or more species, and if there were only one specimen, could be considered a variety. It seems to be related to *T. moniliata* Heilpr.

Pleurotoma (Peratotoma) Gardneri, n. sp. Pl. 1. Figs. 7, 8.

Shell medium, substance rather thin, broadly conic ; whorls nine to ten, embryonic ones four in number, the spire very small, but the whorls rapidly expanding, the permanent whorls profusely ornamented with both longitudinal and spiral raised lines, the peripheral part and below carrying nodes while the spirals are alternate in size and thickness. Body whorl large, shouldered, profusely ornamented, the spirals nodular ; just below the suture there are a couple coarser than the others and also at base ; aperture half the length of the shell, smooth within, inner lip with a thin callus ; canal recurved and slightly spatulate. Length 21 mm.

Locality.—Pugh's branch of Satilpa Creek, Ala., Gosport Sand.

Type.—Ala. Museum of Nat. History, University, Ala.

Remarks.—This species is on the borderland between *Fusus*, *Strepsidura* and *Pleurotoma*. It is very close to *Pl. heilprini*, *nobis* from Jackson, Miss. The largest specimen is 25 mm. in length. The slit is not pronounced. Named in honor of Miss Julia A. Gardner of the National Museum.

Odostomia (Evalea) Bartschi, n. sp. Pl. 1. Fig. 9.

Shell small, whorls six, spire almost totally immersed, shell rather rapidly expanding. Basal whorl large, suture deep, aperture oblong. One strong, straight fold on the columella placed

centrally; umbilicus open, inner lip somewhat recurved at base. Surface not smooth, carrying microscopic incised spiral lines. Length 3 mm.

Locality.—Found at both Gregg's and Bell's Landings.

Type.—From Bell's Ldg. In the Ala. Museum.

Turbonilla (Ptycheulimella) clinensis, n. sp. Pl. 1. Fig. 10.

Shell small, narrow, whorls eight, two embryonic, the next three longitudinally striated, balance smooth. Spire blunt, suture distinct, aperture small. Outer lip smooth within, inner lip with a strong fold curving up into the aperture and bordering the base. Length 3+ mm.

Locality.—Gregg's Landing, Ala.

Type.—Alabama Museum, University, Ala.

Remarks.—Seems to be a distinct species. There are three other species of *Turbonilla* in the State Collection but too imperfect to warrant description.

Turbonilla (Cingulina) tuscahomensis, n. sp. Pl. 1. Fig. 11.

Shell small, whorls nine, the first three embryonic ; apex small, the fourth and fifth whorls with raised spirals, balance carrying five strong spirals, and somewhat cancellated ; suture deeply impressed. The space above the first or lowest spiral slightly wider than between the other four. Aperture broadly ovate ; inner lip slightly reflected ; base slightly spatulate. Length 4 mm. Figured specimen from Bell's Ldg.

Locality.—Both Gregg's and Bell's Ldg., Alabama.

Type.—Alabama Museum of Nat. History.

Remarks.—Looks like a *Bittium.*

Turbonilla (Ptycheulimella) tardiusculus, n. sp. Pl. 1. Fig. 12.

Shell with nine whorls, the first two embryonic, the balance smooth and of a dull brown color, substance of shell rather solid, suture lightly impressed, banded below. Aperture small, inner lip reflected at base, imperforate ; no fold showing on the columella. Two specimens found. Length 4½ mm.

Locality.—Cave Branch, Ala. Woods bluff beds.

Type.—My collection.

Pyramidella (Iphiana) anita Ald.

The Nautilus, Vol. XXI, No. 1, p. 9, Pl. 1, Fig. 12, May, 1907.

This species was described as a *Turbonilla*, but is now put into the *Pyramidellidæ* by Dr. Bartsch.

Pyramidella (Syrnola) mitchelliana Aldr.

Bull. of American Paleontology, No. 22, P. 8, Pl. 3, Fig. 3, 1911.

Is also removed from *Turbonilla.*

The Ala. Museum has a number of new forms of small species, collected by Mr. Herbert A. Smith which are described herein. They have been submitted to Dr. Bartsch who has kindly indicated their generic position.

Pyramidella (Iphiana) obtusoides, n. sp. Pl. 1. Fig. 13.

Shell small, with four whorls capped by two embryonic ones turned abruptly to the back side of shell and partially immersed. The specimens, three in number, have a dull surface, apparently smooth, but under a glass numerous spiral lines are seen. Suture not deeply impressed ; aperture oblong-ovate ; outer lip sharp, smooth within ; inner lip reflected, somewhat twisted, carrying a single small tooth. Length 3½ mm.

Locality.—Found at both Gregg's and Bell's Landings, Ala. River, Ala.

Type.—Ala. Museum of Natural History.

Remarks.—A short, dull-looking species.

Epitonium munistriatum, n. sp. Pl. 1. Figs. 14, 15.

Shell small, aciculate whorls, probably 10 or more. Embryonic ones three in number, apex pointed ; the next two or three with longitudinals only, balance cancellated. Whorls rounded, suture deep. Spirals 5 to 7, rather coarse, ribs raised with concave spaces between, base with smaller alternate spirals between the primaries ; intersections pointed. The base of this species (15) is in the Museum from Gregg's Landing, Ala. The other specimen is from Woods Bluff, Ala. The aperture shows a a thickened inner lip where it joins the base, also a thin callus.

Locality.—As above.

Type—Ala. Museum of Nat. History.

Epitonium multiliniferum, n. sp. Pl. 1. Fig. 16.

All the specimens are fragmentary, but well marked. Embryonic whorls missing ; suture distinct. Ribs on body whorl 34 in number, extending over the base, much weaker there ; very numerous close set spiral lines between the ribs. Aperture round, inner lip thickened, no umbilicus.

Locality.—Cave Branch, Ala. Woods Bluff beds.

Type.—My cabinet.

Remarks.—This is a distinct species and it deserves differentiation from the other forms. The figure given by Prof. Harris in Bull. Am. Paleontology, No. 11, Pl. 12, Fig. 8, is probably a young example of this species. The sides are more nearly parallel than in most *Epitoniums*.

Epitonium subacutum, n. sp. Pl. 1. Figs. 17, 18.

Shell thin, narrowly acute, whorls 12. The first five are embryonic and smooth ; the balance spirally striated ; cancellated. The vertical ribs on the body whorl about twenty-six in number, curving into the umbilicus. They are thin or acute ; the primary spirals about ten in number with finer alternate lines between ; inner lip with a slight callus. Length 10 mm.

Locality.—Cave Branch, Ala. Woods Bluff beds.

Type.—In Ala. Museum. One specimen shows the base and the other the embryonic shell.

Teinostoma subangulata Mr. var. **Smithii**, n. var. Pl. 1. Figs. 19, 20.

Shell small, flattened above, rounded below ; umbilicus not large ; a callus on the base which enters the umbilicus and continues within. Bordering the suture is an appressed area raised above the whorls ; surface above with numerous close set revolving lines ; periphery smooth with a few revolving lines below. Aperture circular ; outer lip somewhat thickened ; lines of growth perceptible ; interior somewhat pearly. Diameter 8 mm.

Locality.—Bell's Landing, Ala.

Type.—Ala. Museum of Natural History.

Remarks.—Very much larger than the type of *T. subangulata* Mr. Looks very much like a land shell. It differs somewhat from Meyer's species in the shape of the aperture.

Teinostoma regularis, n. sp. Pl. 1. Figs. 21-2.

Shell small but larger than the ordinary species of this genus ; whorls five, depressed above ; periphery rounded ; surface covered with fine lines which are crossed with lines of growth. Under a glass the intersections give the surface a beaded appearance ; a depressed space just below the suture. The base has coarser lines with a smooth space around the umbilicus which is open ; aperture oval. Diameter 4 mm.

Locality.—Pugh's Branch of Satilpa Creek, Clark Co., Ala. Gosport Sand.

Type.—Ala. Museum at University, Ala.

Remarks.—This little shell may possibly belong to the subgenus *Omphalius* of *Chlorostoma* but it seems closer to *Teinostoma*.

Ancillopsis Tuomoyi, n. sp. Pl. 1. Figs. 23, 24.

Shell solid, thick, oblong, smooth and shining ; whorls 5-6 ; spire rather pointed ; the first four whorls small, the others rapidly increasing ; a swollen callus reaching above the body whorl and also covering the front of this whorl and lapping over the back of this whorl. A deep suture reaches the aperture where it is rather wide ; a few irregular lines of growth are visible ; aperture about three-fourths the length of the shell, oblong-ovate; columella smooth, concave. The basal groove shows strongly at base, but only showing a short distance up where it is covered by the enamel. Length 28 mm ; breadth 21 mm.

Locality.—Bell's Landing, lower bed, also one example from Gregg's Landing, Ala. The lower bed at Bell's Landing is the same bed as at Gregg's Ldg. Type from Bell's Landing, lower bed.

Type.—Ala. Museum of Nat. History.

Remarks.—This species resembles *Macron* in some respects but is evidently an *Ancillopsis*.

Nassa pleona, n. sp. Pl. 1. Figs. 25, 26.

Shell small, nuclear whorls broken off. Four remaining whorls carry longitudinal ribs that are crossed by two spirals,

nodular at intersections. Two close set spirals border the suture above and below same ; suture channelled ; the last whorl carries about 10 widely spaced spirals, raised and nodular with concave spaces between. Outer lip thickened with the spirals extending over same, denticulated ; inner lip enameled with the spirals showing through the same. Canal very short ending in a semicircular opening. Length 12+ mm. Two specimens obtained.

Locality.—Lisbon, Ala.

Type.—My cabinet.

Olivella semilignitica, n. sp. Pl. 1. Figs. 27, 28.

Shell small, whorls six, four smooth ; the fourth and subsequent ones bounded by a raised band just below the suture ; apex blunt, body whorl showing impressed lines of growth ; aperture as in the genus. Length 5½ mm.

Locality.—Clark County, Ala. Woods Bluff horizon.

Type. —Ala. Museum of Nat. History.

Remarks.—The sutural callosity pronounced on the last whorl only. Differs from *O. mediavia* Harris in being smaller, more blunt, with fewer folds on the columella, and by a raised sutural band.

Gilbertia estellensis, n. sp. Pl. 2. Figs. 6, 7.

Shell globular, whorls three ; the first embryonic ; the second spirally striated but very narrow ; the third very globose and spirally striated ; outer lip thickened and broadly reflected ; a single tooth projecting into the aperture from it ; inner lip thickened with a broad spatulate tooth above, and two prominent teeth near the base ; the outer lip partially covering the second whorl. Under a glass the striæ show that they are pitted as in *Actæon*. Height 2½ mm. ; breadth 2 mm.

Locality.—Sucarnoochee beds, 3 miles south of Estella, Ala.

Type.—Ala. State Museum, University, Ala.

Cancellaria Gilberti, n. sp. Pl. 1. Fig. 29.

Shell with seven whorls remaining ; the spire is damaged ; cancellated ; suture deeply impressed and constricted, especially

on the lower whorls. Below the suture is a raised cord marked with a spiral line upon the lower whorls ; above the suture is a wider space bounded by strong raised spirals with other raised spirals above. Body whorl expanded with a strong spiral at the periphery ; those above this are close together, those below alternated with a finer spiral ; lines of growth show on body whorl reversing near the base ; aperture oblong-ovate, the spiral lines rounding into same ; columella with two folds ; shell has a small umbilicus. Labrum lirate within. Length 9 mm.; breadth 4 mm.

Locality.—Gregg's Ldg., Ala. River, Ala.

Type.—Ala. Museum of Nat. History.

Remarks.—Only one specimen found. This species has many of the characters of *Admete*.

Ovula regularoidea, n. sp. Pl. 1. Fig. 30.

Shell small, elongate ; both anterior and posterior with fine revolving lines ; main body of shell smooth ; outer lip thickened and crenulated from beak to base ; inner lip also crenulated its whole length ; a heavy callus on the outer surface of the columella at the posterior end with the canal extending beyond the callus. On the smaller of the two specimens before me there are fine revolving lines half way down from the posterior ; aperture narrow, expanding back of the anterior canal ; ends somewhat flattened. Length of largest specimen 14 mm.

Locality.—Bell's Landing marl, Ala. River, Ala.

Type.—Ala. Museum of Nat. History.

Cypræa estellensis, n. sp. Pl. 2. Fig. 1.

Shell small ; rotund ; smooth ; aperture narrow ; outer lip curving into the apex which is open. Length 12 mm. Breadth 10 mm.

Locality.—Sucarnoochee beds, Pursley Creek, Wilcox Co., Ala.

Type.—Ala. State Museum.

Remarks.—This specimen has only preserved the shell in part but the interior is hard rock and gives the form quite accurately. The aperture is all filled with matrix, hiding the denti-

tion. Prof. Harris mentions finding one species at Fort Gaines on the Chattahoochee and another (which is probably the one subsequently described ½ mile north of Ripley, Miss.) They are figured and named as they seem to be rare and peculiar to this horizon.

Cypræa sp. ? Pl. 2. Figs. 2, 3.

Shell small ; surface smooth ; basal callus extending partially over the sides ; outer lip expanded ; extremities somewhat pointed. One fragment shows the dentition, consisting of over 20 small teeth on the inner lip. Length of the larger fragment 15 mm.

Locality.—Sucarnoochee beds, one and three miles south of Estella, Ala. on Pursley Creek.

Types.—Ala. Museum of Nat. History.

Seems to be rather close to *Cypræa Smithi nobis* from Gregg's Ldg., Ala.

Siphonalia quadrilineata, n. sp. Pl. 2. Figs. 4, 5.

Shell resembling the *Fusus subscalarinus* Heilpr. Whorls eight, two embryonic, the balance more or less cancellated ; longitudinal costæ somewhat rounded; spiral striæ very numerous, four fine ones between a coarser line ; the volutions are appressed at the suture ; the spiral striæ cross over the costæ and the coarse lines make nodes of intersections ; canal reflected and twisted : the outer lip on the type is broken away but appears to have been smooth internally ; inner lip somewhat thickened. Length 17 mm.

Locality.—Pugh's Branch of Satilpa Creek, Clark Co., Ala. Gosport Sand.

Type.—In Ala. Museum, University Ala.

Remark.—One is rather rash to attempt a new form herewith but the surface ornamentation is peculiar and seems to be new.

Cerithiopsis estellensis, n. sp. Pl. 2. Fig. 10.

Shell minute ; whorls eleven or more, the first two smooth, the next two with raised ribs ; the balance showing two strong, heavily beaded spirals on the peripheral part of each whorl with

a third spiral much finer just below the suture ; one or more whorls are missing from the basal part.

Length 3 mm.

Locality.—Sucarnoochee clays, near Estella, Ala.

Type.—In Ala. Museum at University, Ala.

Lævibuccinum (Euryochetus ?) harrisi, n. sp. Pl. 2, Figs. 7-9.

Shell small ; whorls eight, three smooth, the other five below with close-set raised lines ; outer lip smooth, slightly incurved ; inner lip with a callus, thicker and slightly raised on the canal, which is short, rather wide ; shell somewhat truncated anteriorly ; suture distinct. Length of largest specimen 4½ mm.

Locality.—Cave Branch, Ala., about 6 miles east of Thomasville, Ala. Woods Bluff beds.

Type.—Ala. Museum of Nat. Hist., University, Ala.

Remarks.—This shell is quite fragile, the body whorl breaking away from the spire. Prof. Harris figured the spire of this species under *Aesopus erectus* (Proc. Acad. Nat. Sciences, Phila., 1896, p. 476, pl. 21, fig. 3), which it resembles, but later on states it is not the same. The Ala. Museum has three specimens, and there are two broken ones in my cabinet.

Type.—Ala. Museum of Nat. History, University, Ala.

TENUIACTÆON, n. g.

Shell resembling *Actæon* but much more slender ; whorls nine ; aperture small, spire turned to the left and partially immersed ; suture deep ; columella with one fold ; surface with numerous incised revolving lines.

Tenuiactæon pertenuis, n. sp. Pl. 2, Fig. 10.

Shell small, slender ; whorls 9 ; surface with numerous revolving incised lines, stronger at base but almost disappearing at the shoulder of body whorl ; then just below the suture showing two or three stronger ones ; apex rounded and turned to the left, partially immersed ; outer lip somewhat incurved ; base rounded ; columella with one strong fold ; the inner lip reflected over the body whorl ; suture deep, giving each whorl the appearance of being inserted into the next succeeding one. Length 13 mm. ; breadth of body whorl 4 mm. ; aperture 5 mm.

Locality.—Gregg's Ldg. marl at Bell's Ldg. and Gregg's Ldg., Ala. River, Ala.

Type.—Ala. State Museum at University, Ala.

Teredo ringens, n. sp. Pl. 2. Fig. 12.

Shell substance thin, closed at the larger end like *Kuphus ;* body of shell with raised, rather acute rings parallel to each other, and virtually at right angles to the longer diameter. Other fragments are not so stongly marked. Length of type specimen 37 mm. Average breadth 5 mm.

Locality.—Sucarnochee clay bed, 3 miles south of Estelle, Ala.

Type.—Alabama Museum, University, Ala.

Tellina estellensis, n. sp. Pl. 2. Figs. 13, 14.

Shell small, exceedigly thin, exterior smooth, except fine growth lines ; these are stronger near the ventral margin ; inequilateral ; right valve with small laterals, larger in the opposite valve ; pallial sinus large, rounded ; anterior somewhat pointed ; posterior rounded. Length 13-15 mm. ; height 9-11 mm.

Locality.—Sucarnochee beds, near Estelle, Ala.

Type.—Ala. Museum of Nat. History, University, Ala.

Remarks.—This species is the same figured by Prof. Harris (Bulletins Am. Pal., Vol. 1, p. 182) as a cast. It is rather common but so very fragile it was almost impossible to procure a perfect example.

Tellina cynoglossa Dall.

This is the common species in the Woods Bluff beds. It seems to be only a variety of *Tellina subtriangularis* Aldr., which was described from half grown specimens, which is more regularly rounded posteriorly and also lacks the fold seen in older specimens. The full grown examples from Woods Bluff on the Tombigbee River measure as much as 25 mm. in length

Tellina bellsiana, n. sp. Pl. 2. Figs. 15, 16.

Shell large, flat, thin ; nearly equilateral ; surface faintly concentrically striate ; lines growing coarser on the anterior end ;

beaks very small ; the dorsal area strongly bent, pallial area gibbous ; teeth normal. Height about 24 mm.

Locality.—Both Gregg's and Bell's Landings, Ala. River, Ala.

Type.—Ala. Museum of Nat. Hist.

Remarks.—One example in the Carnegie Museum. The type is broken some, shell thin for its size.

Tellina semirotunda, n. sp. Pl. 2. Fig. 17.

Shell medium ; nearly equilateral ; anterior somewhat pointed ; surface smooth, except lines of growth irregularly spaced ; a slightly depressed area extending from beak to base behind the anterior fold. Cicatrices rather large, are well marked ; pallial area large ; cardinals bifid. Length 16 mm. ; height 9 mm.

Locality.—Both Gregg's and Bell's Ldg., Ala. River, Ala.

Type.—Ala. Museum of Natural History.

Tellina semipapyria, n. sp. Pl. 2. Fig. 18.

Shell medium, resembling *Tellina semirotunda nobis ;* surface smooth except growth lines ; pallial sinus large, partially confluent with the pallial line ; only left valve known.

Locality.—Jackson's Rockhouse branch. Woods Bluff beds. Ala. Length 23 mm. ; height 9mm.

Type.—Ala. Museum of Nat. History.

Remarks.—Bears a strong resemblance to the Claibornian species *Tellina papyria* Con. but is somewhat more rotund.

Semele langdoniana, n. sp. Pl. 2. Figs. 19, 20.

Shell oblong, oval ; surface practically smooth, showing very fine lines that are coarser on the umbonal slope ; some specimens show also fine radial lines reaching to the ventral margin ; posterior shortest ; ventral margin entire ; pallial sinus profound. Shell looks like a *Tellina* externally. Length of largest specimen is about 27 mm.

Locality.—Bell's Landing, Monroe Co., Ala. River, Ala.

Type.—(Left valve) Ala. Museum, University Ala.

Remarks.—There are several fragmentary specimens in the

lot. This species is named after the late Dr. W. Langdon, an Assistant State Geologist of Alabama and the discoverer of the Floridian Miocene.

Semele monroensis, n. sp. Pl. 2. Figs. 21, 22.

Shell small, rather flat ; one right valve only in the collection ; umbonal slope strongly bent ; surface smooth above with several widely spaced lines towards the ventral margin ; hinge stout ; ligament long for the genus ; the umbonal slope marked interiorly by a few radial lines. Length 5 mm.

Locality.—Bell's Landing, Ala. River, Ala.

Type.—Ala. Museum of Nat. History.

Remarks.—The specimen described is quite young but distinct. Looks like a *Meretrix* in shape and ornamentation.

Lucina primoidea, n. sp. Pl. 2. Figs. 23, 24.

Shell with many raised lines ; beaks recurved, higher than long. This species is figured because it is from an horizon close to the Cretaceous and is doubtless an ancestral form of *Lucina cornuta* Conr. of the Claibornian. The interior is not accessible.

Locality.—Black Bluff, Tombigbee River, Ala., about 20 feet above the base.

Type.—My collection.

Martesia recurva, n. sp. Pl. 2. Figs. 25, 26.

Shell small, short, rotund ; with two accessory plates just forward of the umbones ; groove running nearly vertical from beaks to base and strongly marked ; concentric striæ strongly marked on the posterior end, bending abruptly at the groove and thence running up behind the umbones and under the accessory plates ; the anterior end rounded and smooth ; cardinal margin bordered with a thickened and raised process. Length 8 mm. ; height 4½ mm.

Locality.—Fleming's Mill, Ala., on Pea River. Nanafalia beds.

Type.—My collection.

Remarks.—This species is more obtuse than the usual forms. Three examples found. The interior is not accessible.

Rochefortia minuta, n. sp. Pl. 2. Figs. 27, 28

Shell, small, ovate ; nearly equilateral ; periostracum still adherent, surface showing a few incremental lines ; beaks pointed, with a resiliary pit underneath with short lamellæ on each side, the posterior one the longest ; muscular scar slightly impressed ; the right valve has a space for the left lateral ; pallial line simple. Resembles somewhat *Rochefortia Stimpsoni* Dall. The space in our specimen under the beak looks as though it had been excavated out of the dorsal side, but such is not really the case. Prof. W. H. Dall has examined this specimen, and verified its generic position. Am greatly indebted to him in a number of cases. Length 3 mm. ; height 2 mm.

Locality.—Bell's Ldg., Alabama River, Ala.

Type.—Ala. Museum.

Montacuta bicuspidata, n. sp. Pl. 2. Figs. 29, 30.

Shell minute, oblong-ovate ; surface with incremental lines ; beaks carrying the prodissoconch, nearly central ; viewing the shell from the outside and above, it shows two tooth-like projections, one on each side of the beak, rising from the dorsal margin and another shorter one which does not show like the two first mentioned ; ends rounded ; base arcuate ; hinge with a small subtrigonal tooth and also a space for a lateral in the other valve. Pallial line simple ; adductors distinct but not deep. Length 2¾ mm ; height 2 mm.

Locality.—Bell's Ldg., Ala.

Type.—Ala. Mus. of Nat. History, University, Ala.

Basterotia ? prima, n. sp. Pl. 3. Figs. 1, 2, 3.

Shell small ; valves rather thick ; subquadrangular ; beaks subterminal ; shell profoundly gaping at the anterior ventral part ; a depressed space running from umbo to ventral margin ; surface nearly smooth, showing growth lines which also show in the interior. Anterior adductor scar deep, with a raised border buttressed to hinge plate ; posterior scar slightly impressed, pear-shaped and both rather large for the size of shell ; one cardinal tooth in right valve, corresponding to a deep socket

in the other ; a longer tooth below. Three single valves in the collection. Length 8 mm. ; height about 7 mm.

Locality.—Gregg's and Bell's Landings, Ala. River, Ala.

Type.—In Ala. Museum.

Remarks.—This species is doubtfully placed in *Basterotia ;* the large gap suggests an attachment to some other form, but is not irregular. Prof. Dall has kindly examined it, and suggests that it might be commensal.

Saxicavella alabamensis, n. sp. Pl. 3. Figs. 4, 5.

Shell inequivalve ; thin ; posterior much broader than the anterior ; outer surface showing irregular lines of growth, stronger over the umbonal slope ; an upright cardinal tooth directly under the umbo, with a short lateral on posterior side in the right valve ; anterior muscular impression distinct ; pallial line faint. Only one valve in the collection. Length 6 mm. ; height 4½ mm.

Locality.—Bell's Landing, Monroe Co., Ala.

Type.—In Ala. Museum.

Montacuta Herberti, n. sp. Pl. 3. Figs. 6, 7.

Shell small ; inequilateral ; dorsal and ventral margins rounded ; each end rather blunt ; the posterior somewhat angulated ; surface smooth with very fine concentric striations, and a few lines of growth near the ventral margin ; shell inflated ; cardinals feeble, showing in left valve only ; beaks low, rather pointed, a small buttress under them. Length 9 mm ; height 6½ mm.

Locality.—Cave Branch, Ala.

Type.—Ala. Museum of Nat. History.

Remarks.—One valve in my collection. Named in honor of the late Herbert H. Smith.

Ervilia lignitica, n. sp. Pl. 3. Figs. 8, 9.

Shell small, inflated ; nearly inequilateral ; rather solid ; the posterior slightly longer than the anterior ; both ends rounded ; surface carrying a few irregularly spaced grooves of growth; interior polished, shining ; pallial sinus small, not reaching to

center ; umbones small, dentition as in the genus with short and strong teeth. Length 6 mm. ; height 3½ mm.

Locality.—Both Gregg's and Bell's Landing beds, Ala. River, Ala.

Type.—Ala. Museum of Nat. History, University, Ala.

Remarks.—This species has a strong resemblance to *Ervilia polita* Dall from the Floridian Pliocene. The young seem to be higher in proportion to their length than the full grown specimens.

Panopea bellsensis, n. sp. Pl. 3. Figs. 10, 11.

Shell rather large, thin, with a brown epidermis ; lines of growth irregularly spaced ; shell compressed, nearly equilateral ; beaks small, appressed to and partly covered by the reflected dorsal margin ; one large cardinal tooth ; ligamental attachment short ; interior porcellaneous with growth lines showing through; pedal scars small. Length 30 mm. ; height about 13 mm.

Locality.—Bell's Ldg., Ala. River, Ala.

Type.—Ala. Museum of Natural History.

Remarks.—One valve and some fragments in the collection. This species has its epidermis preserved. The shell is extremely thin and delicate.

Donax acutangula, n. sp. Pl. 3. Fig. 12.

Shell nearly equilateral ; pointed at both ends, the umbonal slope bent abruptly to almost a right angle in old specimens ; surface nearly smooth ; fine growth lines showing ; ventral margin entire ; beaks small, pointed, smooth ; hinge well developed ; laterals very long, striated on the inner edges. Length about 31 mm. ; height 15 mm.

Locality.—Bell's Landing, Ala. River, Ala.

Type.—Ala. Museum of Nat. History, University Ala.

Remarks.—One whole valve and several fragments of both valves received.

Arca (Cucullaria) ozarkensis, n. sp. Pl. 3. Figs. 13, 14.

Shell small, rounded at both ends, giving the shell a quad-

rangular outline ; beaks small, compressed and pointed ; surface with rather close set radial lines on the posterior slope ; balance of the surface smooth ; teeth as in the subgenus, three or four anterior and two posterior ; muscular scars shallow but plainly marked. Length 5 mm. ; height 3 mm.

Locality.—Woods Bluff beds near Ozark, Ala.

Type.—My cabinet.

Ostrea intermedoides, n. sp. Pl. 3. Figs. 15, 16.

Shell medium, valves rather thin ; surface in older specimen with numerous raised concentric ribs ; the lower valve bent downwards near the beak ; the umbo shows radial striæ ; margins crenulated internally ; a fragment of the upper valve appears to be flat. Length of lower valve 32 mm. ; breadth about 20 mm.

Locality.—Bell's Landing marl, Bell's Landing, Ala. River, Ala.

Type.—Ala. Museum of Nat. History.

Remarks.—Have hesitated to add another oyster to our Eocene, but I have been unable to find a place for this species. Four lower valves and a fragment of the upper valve are in the collection. The ornamentation recalls *O. falco* Dall from the Jacksonian.

Psammobia Smithi, n. sp. Pl. 3. Figs. 17, 18.

Shell large ; substance of shell thin ; oblong-ovate ; rather compressed ; surface shining, with fine concentric sculpture medially ; both ends coarser and elevated ; on the posterior slope the laminæ are rough and somewhat mammillated ; beaks very small ; muscular scars distinct but shallow. Length 60 mm. ; height 32 mm. ; Breadth about 12 mm.

Locality.—Gregg's Ldg. marl at Bell's Landing, Ala. River, Ala.

Type.—Alabama Museum of Nat. History, University Ala.

Remarks.—Both valves of this splendid species are in the collection. It bears a general resemblance to *P. filosa* Conrad, but the dimensions are very different. Collected by the late H. H. Smith and named in his honor.

Psammobia harrisi, n. sp. Pl. 3. Figs. 19, 20.

Shell nearly equilateral ; truncate behind, with fine concentric sculpture, coarser at each end ; ligamental area short ; cicatrices distinct ; lateral tooth long ; posterior one short. Length about 37 mm.

Locality.—Gregg's Landing, Ala. River, Ala.

Remarks.—This species resembles *P. ozarkana* Harris but is more obtuse. The type is not perfect.

DIVERSA

(Echinocyamus ?) meyeri, n. sp. Pl. 3. Figs. 21, 22.

Test small, ovate ; flattened below ; deeply pitted with ovate scars above which become nearly square on the sides and below ; substance of the test of moderate thickness ; apicial system nearly central ; ambulacral petals relatively short, straight, with numerous round pores. Peristome is medium circular, and slightly depressed ; periproct not small, closer to the peristome than the side. Length 5 mm. ; width 3½ mm. ; height 3 mm.

Locality.—Gosport Sand, Claiborne, Ala.

Type.—My cabinet.

Remarks.—This species is peculiar in the deep pits covering the surface. It is larger than *E. huxleyanus* Meyer and more obese though egg-shaped. Received from Dr. Otto Meyer in whose honor I have named it.

NOTES

BLACK BLUFF OR SUCARNOCHEE HORIZON.

Prof. H. H. Smith and wife collected a number of species from these clays not far from Camden, Ala., in the vicinity of Estelle, Ala. The deposit consists of an aluminous clay, dark chocolate in color, and contains the greater part of the species mentioned by Prof. G. D. Harris from the bluff at Fort Gaines on the Chattahoochee River where they seem to be represented principally by casts. Those near Estelle are rather numerous, but very fragile. A few new species are described in this paper.

A surprising fact is that a minute *Corbula*, *Corbula* (*Aloidis*) *milium* Dall, originally described from the Wilcoxian is extremely common. The supposed differences in the specific fauna is explained. The two localities are over 100 miles apart. The list of species from near Estelle is as follows :

Leda saffordana Harris.
" *parva* Rogers.
" *quercollis* Harris.
" *milamensis* "
Corbula (*Aloidis*) *milium* Dall.
Glycymeris cf *aviculoides* Con.
Pinna sp. ?
Teredo ringens Aldr.
Yoldia eborea Con.
Venericardia wilcoxensis Dall.
Tellina estellensis Aldr.
Protocardia Harrisi Dall.
Pecten alabamensis Aldr.
Ostrea ? young.
Nucula ovula Lea.
" *mediavia* Harris.
Modiola saffordi Gabb.
Meretrix ripleyana Gabb.
Cucullæa saffordi Gabb.
" *macrodonta* Whitf.
Crassatellites sepulcollis Harris.
" *gabbi* Safford.
Arca sp. ?
Corbula subcompressa Gabb.
Strepsidura Heilprini Aldr.
Volutilithes rugatus Con.
" *limopsis* Con.
Turritella tennesseensis Gabb.
" *mortoni* Con.
" *humerosa* Con.
Turritella alabamiensis Whitf.

Triton showalteri Con.
Solarium periscelidum Dall.
Solariella alabamensis Ald.
Rissoina alabamensis Ald.
Pseudoliva unicarinata Ald.
" *scalina* Heilpr.
Pleurotoma quercollis Harris.
" *persa* Whitf.
" *mediavia* Harris.
" *adeona* Whitf.
" *longipersa* Harris (var.)
Calyptraphorus velatus, var. *compressus* Aldr.
Olivella mediavia Harris.
Natica saffordia ? "
" *reversa* Whitf.
" *onusta* "
" *eminula* Con.
" *limula* "
Amaura tombigbeensis Harris.
Mesalia watsonensis Harris.
" *pumila* Gabb (var.)
" *alabamiensis* Whitf.
Levifusus pagoda Heilpr.
' *dalei* Harris.
Fusus quercollis Harris.
" *ottonis* Aldr.
" *tortilis* Whitf.
" *mohri* Aldr.
Dentalium mediaviense Harris.
Cadulus turgidus Mr.
Atys robustoides Aldr.
Tornatella quercollis Harris.
Cylichna meyeri Aldr.
Gilbertia estellensis Aldr.
Cypræa 2 sp.

Exilia pergracilis Con.
Nautilus sp. Fragments.

Flabellum conoideum Vaughan.
Balanophylla haleana M. Ed. & H.
Stenocyathus n. sp.

Foraminifera, 12 species.

EXPLANATION OF PLATE 1

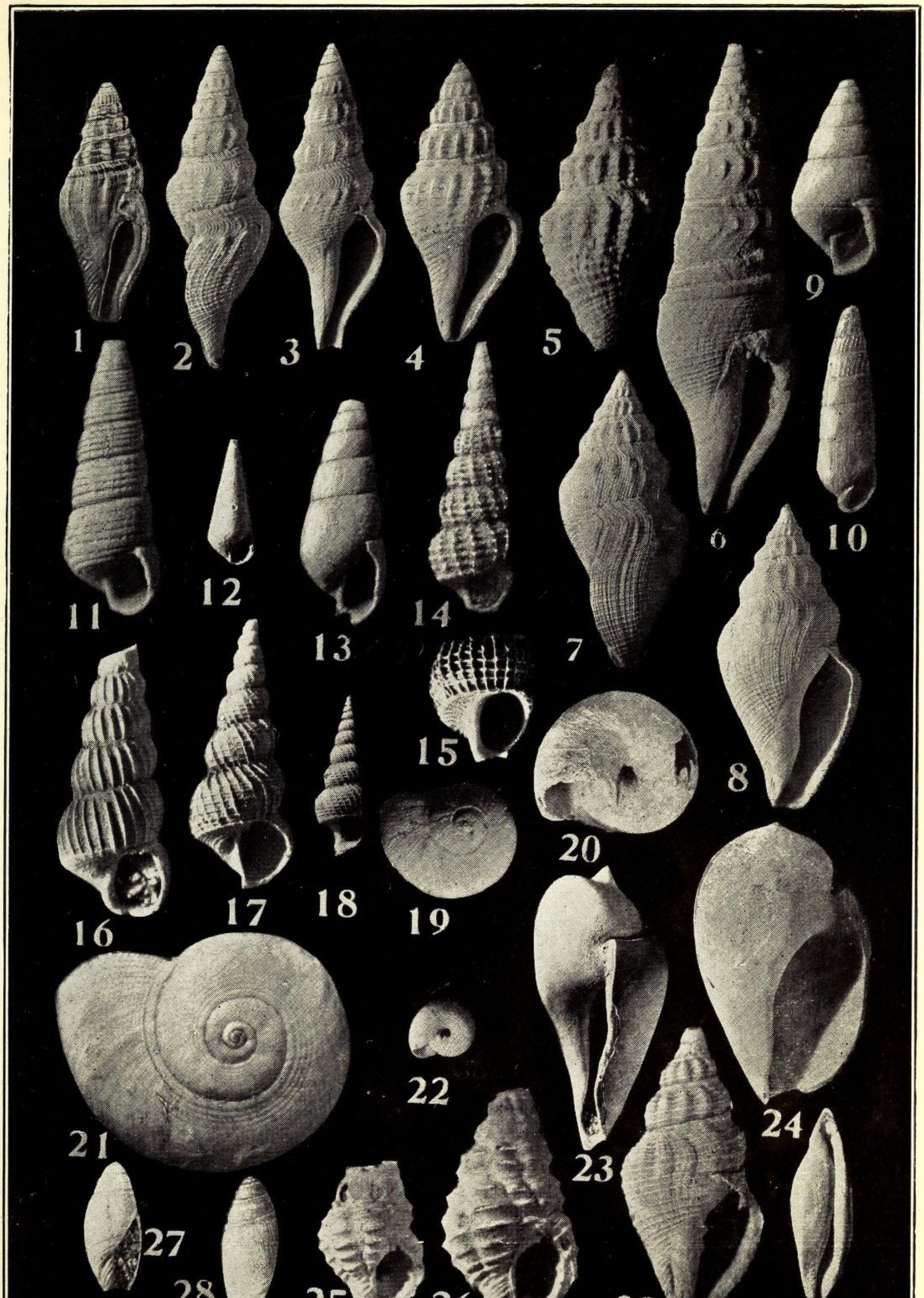
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PLATE 2

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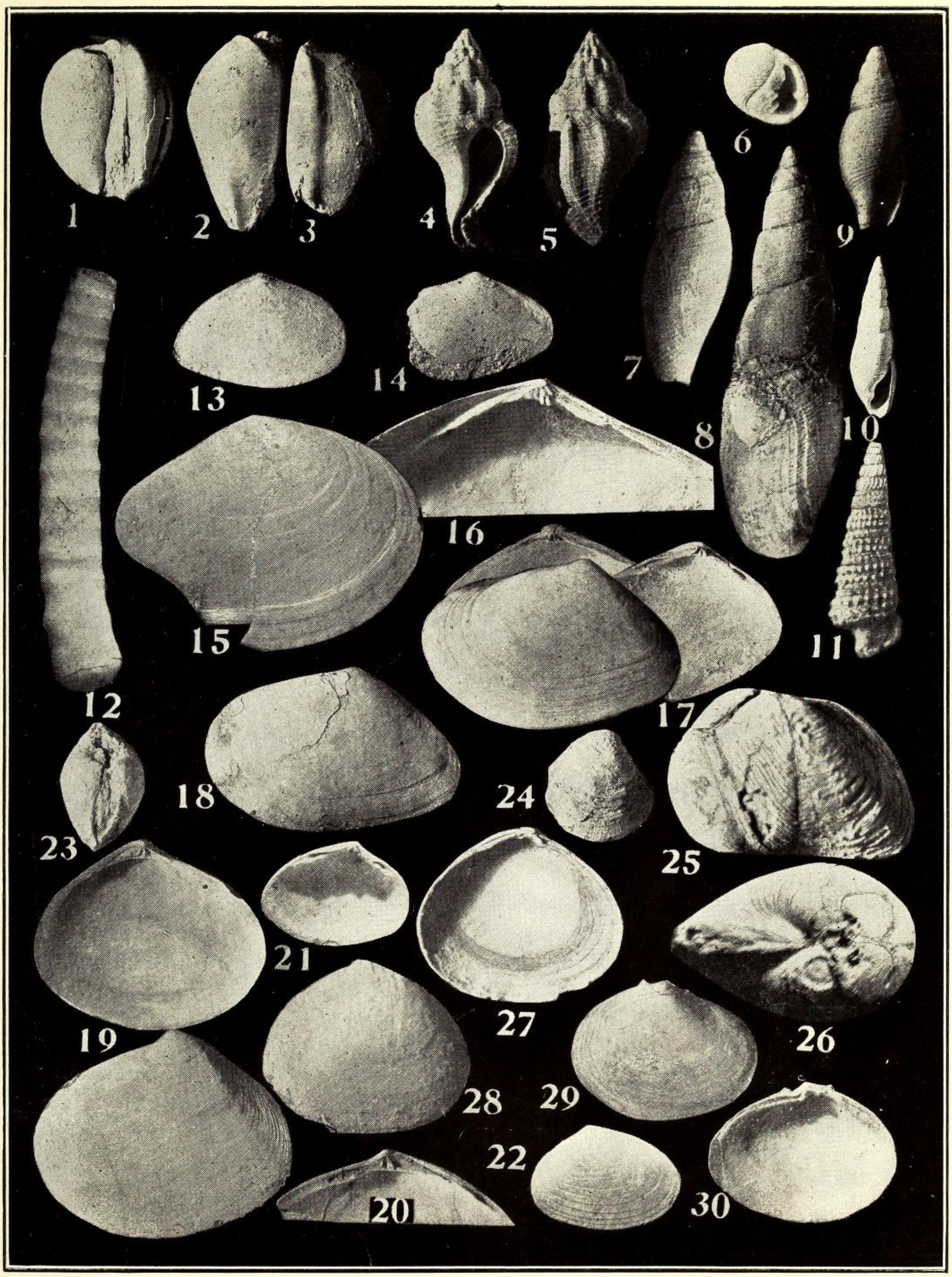
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PLATE 3

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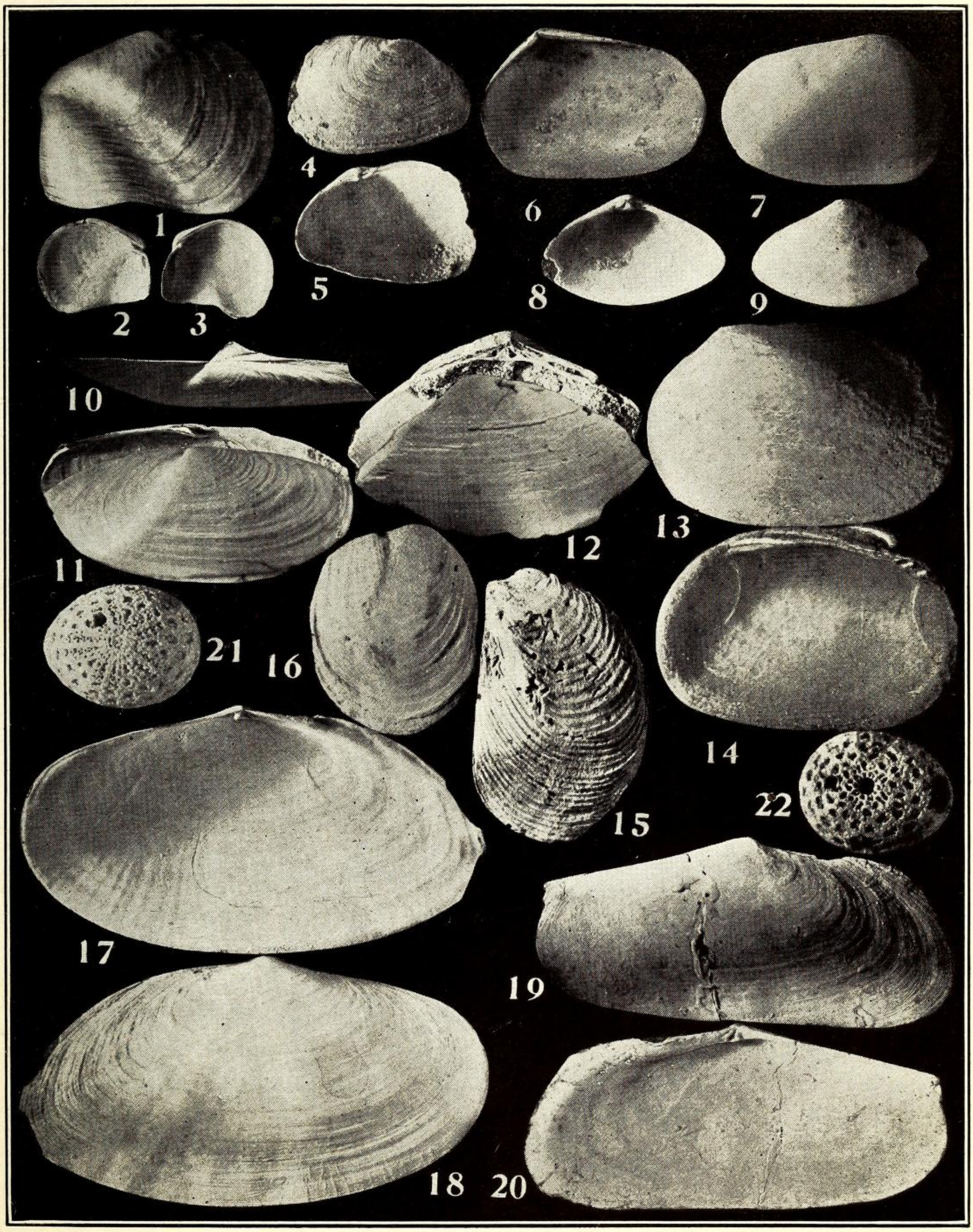
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