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SOME NEW PELECYPODA FROM THE GLEN ROSE FORMATION OF TEXAS

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ABSTRACT—Descriptions are given of several new species of Pelecypoda of the Glen Rose formation of central Texas. Three of these are reef-formers which developed some spectacular reefs, chiefly in the massive limestone members of the lower Glen Rose.

THIS paper deals chiefly with fauna of the lower Glen Rose formation of the Cretaceous of central Texas, but contains some species from the upper Glen Rose. The lower Glen Rose contains a rich fauna, among which are several reef-formers previously undescribed. There are large rudistid, *Toucasia*, and *Monopleura* reefs in the massive limestone beds. Although the fossils are extremely numerous, it is difficult to obtain good specimens from the indurated milestone. In a few places erosion has done an excellent job of dissecting them into cross and longitudinal sections. A few well preserved specimens from the reefs have been collected by Dr. F. L. Whitney. Among these are four new species, three of which are described in this paper. The fourth is a *Monopleura* unlike either *M. marcida* White or *M. subtriquetra* Roemer, which occur in these reefs, but the specimens are not well enough preserved to describe adequately. Whereas the two known species of *Monopleura* from the Glen Rose are twisted, the undescribed species is straight. The writer has seen it in enormous numbers in a reef on Bee Creek, Travis County, Texas, where it occurs usually as badly eroded casts or

gives evidence of its former existence by numerous circular holes.

Toucasia texana (Roemer), originally described by Roemer (1852, p. 41) as *Caprotina texana* was generally believed to have been collected by him from the Edwards limestone, but there is a possibility that he may also have collected specimens from the Glen Rose because he mentions that they were found on the road from New Braunfels to Fredericksburg. He had to travel over much Glen Rose country as well as Edwards to make the journey from one town to the other and could well have found this species in both formations, for the Glen Rose specimens agree in all respects with those of the Edwards limestone, and the massive reef beds of the Glen Rose are so similar in appearance to the Edwards that they have frequently been mistaken for Edwards. The following are some of the localities in which Dr. F. L. Whitney found *Toucasia texana*: along the bluff on the Guadalupe River, 4 miles below Hancock, Texas; 1 mile north of Cranes Mill, Comal County, Texas; and near Wimberly, Hays County, Texas.

In addition to *Toucasia texana*, Dr. Whitney collected two new species of

Toucasia and the *Coalcomana* described here. The latter occurs in some spectacular reefs. There is a strong resemblance of the specimens at hand to the genus *Immanitas* Palmer, but the type specimen was seen by Henry J. MacGillavry, specialist in rudistids, and identified as *Coalcomana*.

This paper also contains descriptions of several other pelecypods of the lower Glen Rose, including some new species of *Trigonia*, which were first named and described by Arno Wendler in an unpublished thesis. These specimens were also collected by Dr. F. L. Whitney. The writer has retained the names given the species by Wendler but re-described the forms.

The type specimens are located in the Department of Geology, The University of Texas, Austin, Texas.

SYSTEMATIC DESCRIPTIONS

Superfamily CHAMACEA Geinitz

Family DICERATIDAE Dall

Genus TOUCASIA Munier-Chalmas

TOUCASIA HANCOCKENSIS Whitney, n. sp.

Plate 86, figures 1-3

Shell small to medium in size, very inequivalve. Beaks twisted and somewhat elevated. Left valve large, flattened and concave on the attachment side; rounded inflated and deeply grooved with two long, curved, narrow, grooves on the opposite side. The edge of the shell is sharply carinate where the original shell is preserved, but rounded in the cast. The right valve is smaller than the left valve, but similar in shape. The superior valve is not truly operculiform because it attains considerable thickness and width. It is flattened and concave on the attachment side; rounded and inflated on the opposite side. Here it is flush with inferior valve or slightly depressed, but never jutting above it as does *Toucasia texana*. The edge is carinate. On the attachment side the superior valve is plainly visible. In some specimens it is practically flush with the surface of the

inferior valve, but in others it is at an angle of 30° to 40° to the inferior valve. The surface of the shell is rough and corrugated where the outside layer is preserved, but is smooth where it is not preserved. Long, curved lines cross the shell. There seem to be at least two thin layers of shell material present, but in some places a third layer is visible. Along the keel the shell material is thicker than elsewhere. The lower layer is translucent while the upper layers seem to be opaque.

Toucasia hancockensis bears some resemblance to *T. texana* but differs in several respects. The beaks are more elevated, giving the shell a more twisted appearance. The superior valve differs in size, shape and position. It is larger, broader and is practically flush with both sides of the inferior valve. It is always visible from the attachment side even when it stands at an angle to the left valve, and its width increases the size of the shell over that of *T. texana*. Also *T. hancockensis* seems to be more inflated. It resembles *T. carinata* Matheron in the shape and placement of the superior valve and in the general shape of the shell. It differs, however, in being much narrower than *T. carinata*.

Occurrence.—Bluff on Guadalupe River 4 miles below Hancock, Texas. Upper Glen Rose.

TOUCASIA PSEUDOPATAGIATA Whitney, n. sp.

Plate 86, figures 4-6

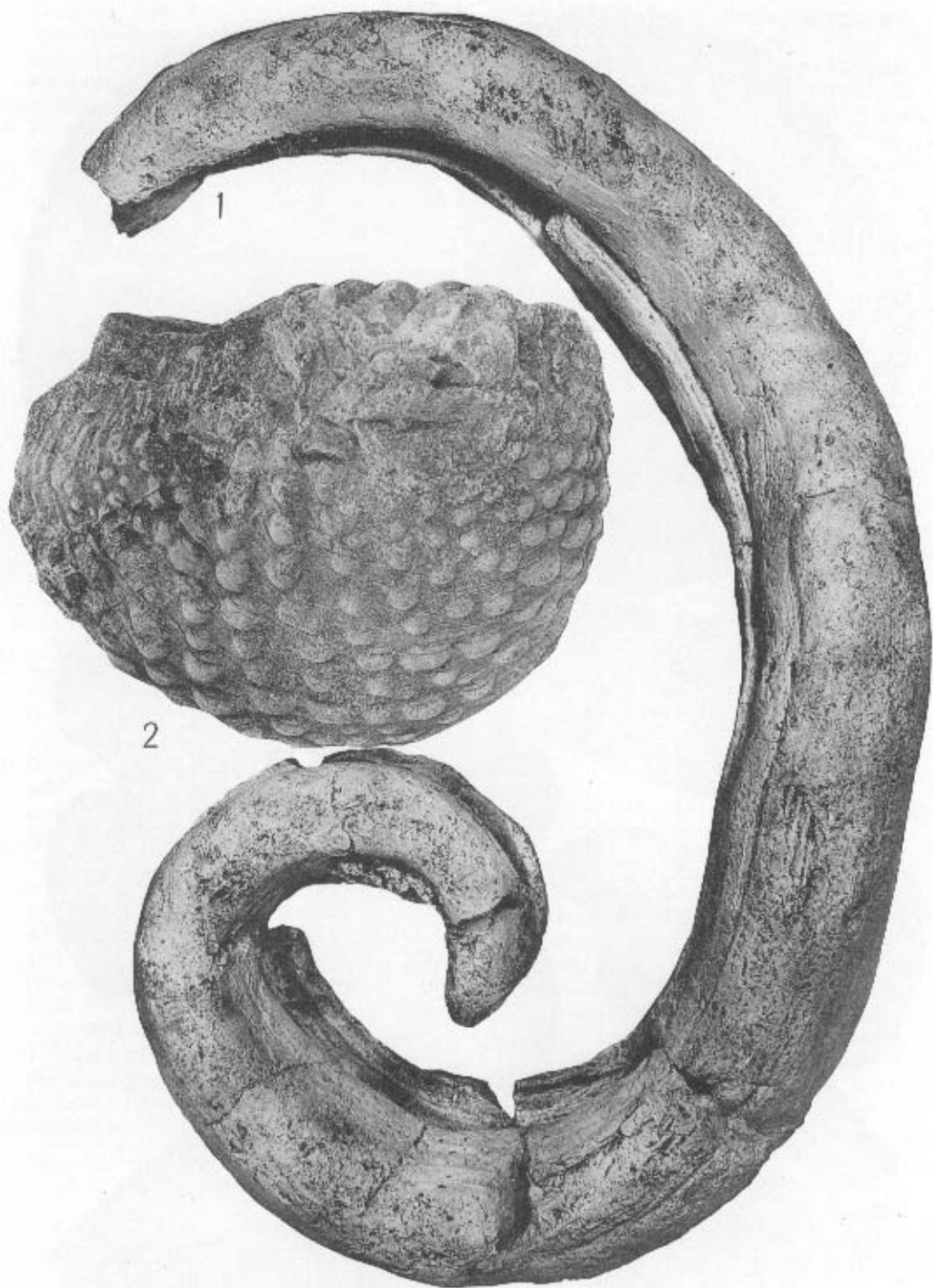
Shell moderately small, greatly elevated and twisted, narrow and inequivalve. Left valve larger, flattened, and concave on the attachment side, rounded and slightly inflated on the opposite side, carinate, contorted, beak highly twisted and elevated. Right valve smaller, somewhat operculiform but quite broad on the anterior end and narrowed at the posterior end. The beaks are twisted but compressed, and the flattened side is wide and concave. The right valve drops sharply away from the

EXPLANATION OF PLATE 86

- FIGS. 1-3—*Toucasia hancockensis* Whitney n. sp., $\times 1$. 1, view of large valve on attachment side. 2, view of opposite side of large valve. 3, view of small valve. (p. 698)
 4-6—*Toucasia pseudopatagiata* Whitney n. sp., $\times 1$. 4, view showing both valves. 5, view of small valve. 6, view of attachment side. (p. 698)
 7-8—*Trigonia whitneyi* Whitney n. sp., $\times 1$. 7, lateral view, 8, dorsal view. (p. 701)



Whitney, Texas Glen Rose Pelecypoda



Whitney, Texas Glen Rose Pelecypoda

inferior valve at an angle of 90° when the shell is viewed from the attachment side, and it can not be seen in this view. On the opposite side it rises obliquely to a considerable height above the inferior valve. The shell material appears to be thin except along the keel and consists of two layers. The outer layer is corrugated, while the inner layer is smooth. Long, oblique lines cover the surface.

Toucasia pseudopatagiata is probably an ancestor of *T. patagiata*, for it has a similar form but is not so twisted nor so high. The beaks are not so elevated and the slopes are not so steep along the sides. The upper valve differs in shape. It is narrower, particularly on the posterior and anterior ends. The beak of the right valve in *T. patagiata* is so large that it coils up over the upper portion of the inferior valve, which gives it quite a different appearance from *T. pseudopatagiata* in this portion, but the rest of the shell is quite similar to it in general appearance.

Type locality.—About 30 feet above the *Salenia texana* horizon near the base of Shovel Mountain near Cypress Creek in Blanco County, Texas. Since the *Salenia texana* horizon has been found by Dr. F. L. Whitney to be just below the boundary between upper and lower Glen Rose, *T. pseudopatagiata* is found in the upper Glen Rose.

FAMILY CAPRINIDAE d'Orbigny

Genus COALCOMANA Harris and Hodson

COALCOMANA TEXANA Whitney, n. sp.

Plate 87, figure 1

Cast very long, slender, arcuate, or loosely coiled. The valves are not quite equal in length, but they are similar in form. In cross section they are roughly quadrangular. Extending the full length of the cast there is a ridge bounded on one side by a very deep, narrow groove and two smaller ridges and on the other side by a smaller groove. On the opposite side of the shell there is a long, sinuous groove extending from beak to beak. The shell structure is eroded, but small, striated ridges appear all over the surface and probably correspond to

tubular structure of the interior. Nothing is known of the dental apparatus. In numerous places it forms reefs. One of the finest reefs is just above Pleasant Valley crossing of the Blanco River, Hays County, Texas. Here cross sections produced by erosion reveal the many rows of canals of the interior.

Dimensions.—Length about 550 mm., width about 50 mm.

Occurrence.—About 234 feet above the base of the Glen Rose, 3 miles north of Hancock, Texas, about one-half mile west of Fischer Store-Hancock road; also found on Highway 46 about 2 miles west of Smithson's Valley, Comal County, Texas. Lower Glen Rose.

Type Locality.—Three miles north of Hancock, Texas, about one-half mile west of Fischer Store-Hancock road.

Superfamily ARCACEA Deshayes

Family ARCIDAE Lamarck

Genus ARCA Lamarck

ARCA TEXANA (Roemer)

Plate 88, figures 8, 9

Cypricardia texana ROEMER 1852, Die Kreidebildungen von Texas, p. 50, pl. 6, fig. 1.

Cypricardia texana ADKINS, Handbook of Cretaceous Fossils, Univ. Texas Bull. 2838, 1928, p. 162.

Cast elongate, trapezoid, small, equi-valve, inequilateral. Umbones anterior, small, rounded on the anterior side, angular and truncated on the posterior side. Beaks separated and only slightly incurved and acuminate. Cardinal area lanceolate, having its greatest expanse on the posterior side. It is distinctly separated from the post-umbonal slope by the ligamentary grooves which come together at the hinge line, forming V-shaped patterns. The most posterior groove is the deepest and longest, while the grooves on the anterior side of the cardinal area are shortest and faintest. The hinge is long and straight. Faint indications of the bottoms of the taxodont teeth at the ends of the ligamentary grooves can be seen on most of the specimens at hand. The narrowly rounded anterior margin joins the hinge line with a rounded obtuse angle and

EXPLANATION OF PLATE 87

FIG. 1—*Coalcomana texana* Whitney n. sp. $\times \frac{1}{4}$.

2—*Trigonia gordonii* Whitney n. sp. $\times \frac{1}{4}$.

(p. 699)

(p. 702)

fairly coarse, regular, and cross the ribs as short, rounded ridges, which give the ribs the appearance of being ropes that extend down over the sides of the shell. Between the ribs can be seen irregular lines of growth. The outer edge of the umbonal slope is rounded and crossed by numerous short, narrow, vertical ridges, usually three to four between each rib. The postumbonal slope is trough-like, concave in the middle, rising at both ends and along the sides. Crossing this are sharp, narrow, straight ridges separated by concave troughs four to five times as wide as the ridges. The troughs are about equal in width to the dorsal ends of the troughs between the radial ribs which cover the sides, but the latter widen greatly in the ventral portion. The postumbonal ridges from both sides of the shell alternate along the umbonal margin and cause the zigzag appearance of the margin. There seems to be no wide exterior umbonal slope area as in other species, but the rounded outer margin marked by fine ridges and often accompanied by a narrow parallel trough on its inner edge takes the place of the wide exterior area normally present in *Trigonia*.

Trigonia whitneyi bears a striking resemblance to *T. limbata* d'Orbigny (loc. cit., pl. 298), but differs in having fewer ribs, more marked crenulations and a different type of marking on the postumbonal slope.

Trigonia whitneyi was described and named by Arno Wendler in an unpublished paper.

Dimensions.—Height about 35 mm., length about 55 mm., and width about 29 mm. No exact dimensions can be given because of the state of preservation and the fact that most of the specimens are at least partially imbedded in sandstone.

Type locality.—Lower Glen Rose at B. M. 845, Cow Creek, Burnet County, Texas.

TRIGONIA GORDONI Whitney, n. sp.

Plate 87, figure 2

Cast large, subtriangular, equivalve, inequilateral, quite compressed. Beaks terminal, small, blunt, tangent. Posterior cardinal margin too poorly preserved in the specimens at hand to characterize beyond the fact that it is sloping and very long. The anterior margin is high, broadly rounded, truncated. Anterior end quite thick but somewhat thinner than the middle of the shell. The ventral margin is long, arcuate, and thin. The posterior margin is fairly wide and bluntly rounded. The posterior end is quite thin. The sides of the shell are quite compressed and are only gently convex. They are decorated with long curving rows of large, rounded, circular or elliptical tubercles. On the wide postumbonal slope these tubercles seem to be small and scattered. In the central portion of the sides the tubercles are generally circular, but a few lengthen vertically. They are irregular in size and somewhat irregular in position. Along the margins they are greatly elongated transversely, crowded, and very irregular in size and position. Between the tubercles are fine, irregular, imbricate, contorted lines of growth.

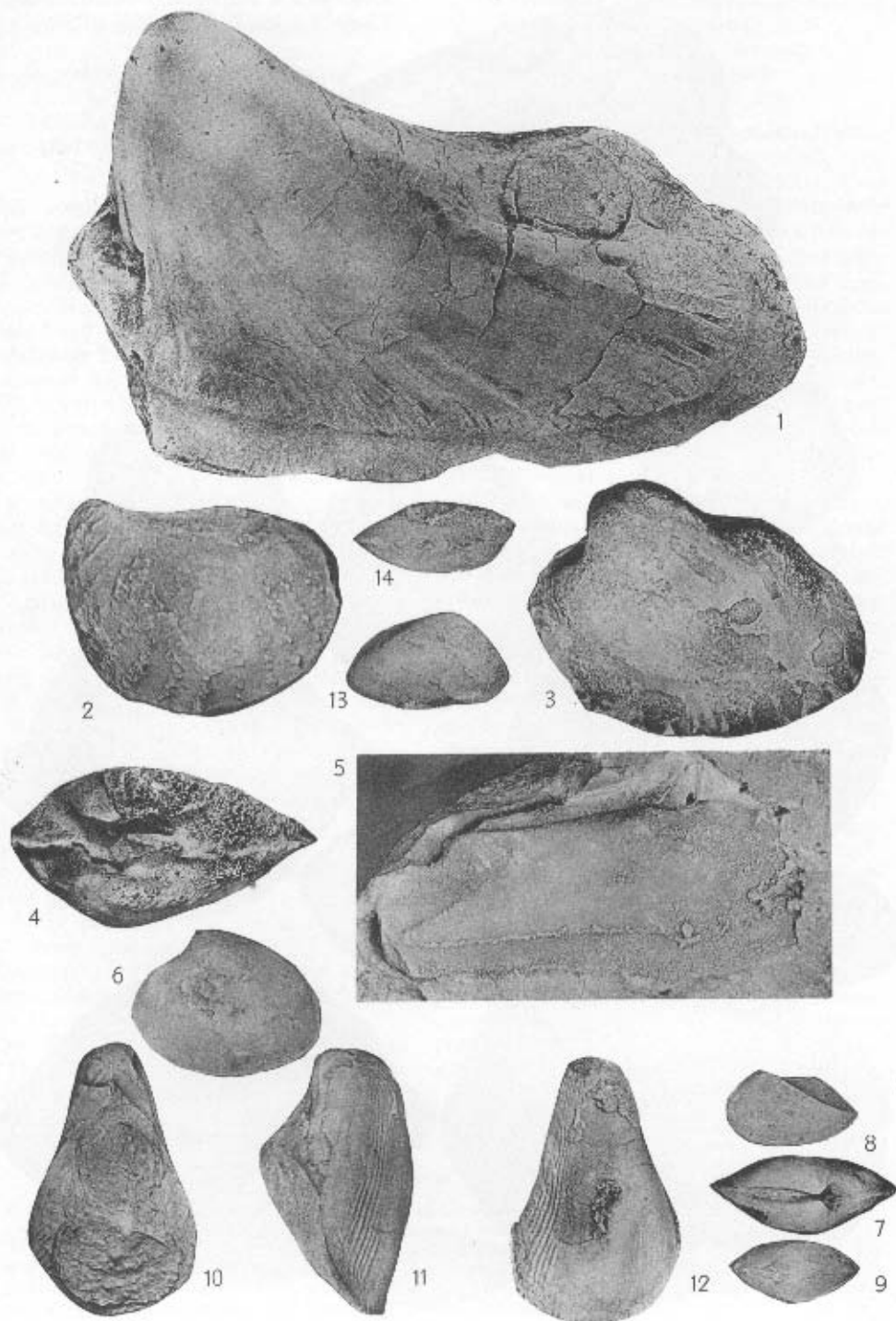
Trigonia gordonii has a great deal in common with *T. daedala* Park but differs in shape and does not appear to have the nodular tubercles on the area. It is possible that *T. gordonii* is closely related to *T. taffi* Cragin, for it seems to fit the description of *T. taffi* in many respects, but since Cragin did not figure it, the relationship can not definitely be established.

Trigonia gordonii was named and described by Arno Wendler in an unpublished paper.

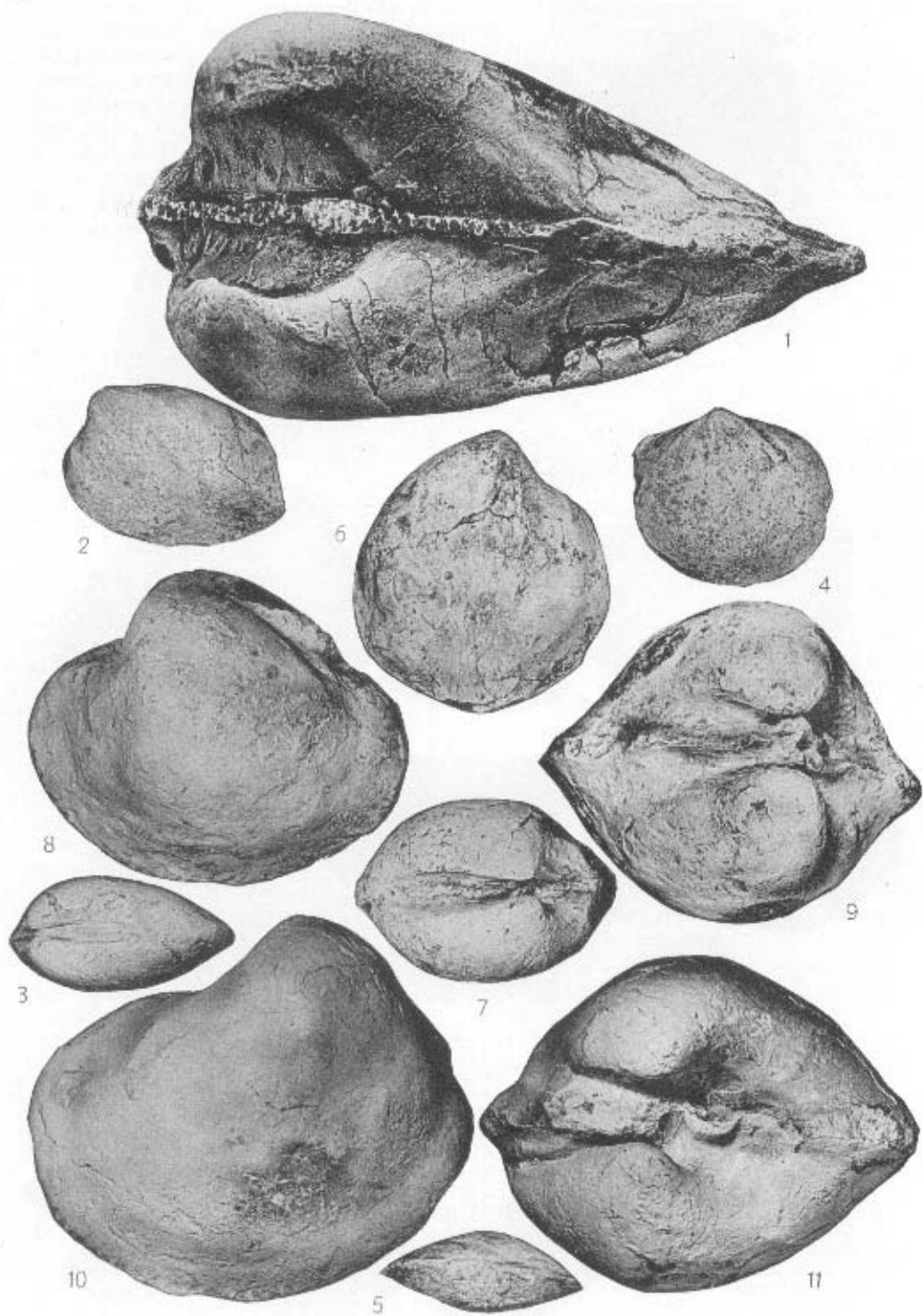
Dimensions.—Height about 75 mm., length 95 mm., width 37 mm.

EXPLANATION OF PLATE 88

- FIG. 1—*Arca simondsi* Whitney n. sp. $\times 1$, lateral view. (p. 700)
 2—*Trigonia wendleri* Whitney n. sp. $\times 1$, lateral view. (p. 701)
 3-4—*Cardita staffordi* Whitney n. sp. $\times 1$. 3, lateral view, 4, dorsal view. (p. 704)
 5—*Crassatellites eifleri* Whitney n. sp. $\times 1$, lateral view. (p. 704)
 6-7—*Tapes bakeri* Whitney n. sp. $\times 1$. 6, lateral view, 7, dorsal view. (p. 705)
 8-9—*Arca texana* (Roemer) $\times 1$. 8, lateral view, 9, dorsal view. (p. 699)
 10-12—*Spondylus olsenaе* Whitney n. sp. $\times 1$. 10, left valve, 11, side view of both valves, 12, right valve. (p. 703)
 13-14—*Cypricardia pelletae* Whitney n. sp. $\times 1$. 13, lateral view, 14, dorsal view. (p. 703)



Whitney, Texas Glen Rose Pelecypoda



Whitney, Texas Glen Rose Pelecypoda

Type locality.—Lower Glen Rose at B. M. 845, Cow Creek, Burnet County, Texas.

Superfamily PECTINACEA Reeve
Family SPONDYLIDAE Fleming
Genus SPONDYLUS Linnaeus

SPONDYLUS OLSENÆ Whitney, n. sp.
Plate 88, figures 10–12

Shell small, narrow, conical, very inequivalve, almost equilateral. The right valve is greatly produced above the left valve. The beak is high, blunt, and rounded. The entire central portion of the right valve is very elevated and rounded. The flanks along the central ridge are flattened and steeply sloping toward the sides. The upper portion of the right valve is very narrow, but the lower portion is quite expanded. The hinge area is large, triangular, and slightly depressed. The whole shell is covered with small, fairly regular, radial ribs which are close together and covered with small spines. The left valve is compressed and almost flat. The beak is slightly rounded and convex, while the ventral margin is somewhat concave to fit into the central ridge on the opposite valve. The inequality in the size of the valves and the flatness of the left valve cause it to have the appearance of an operculum. The wings are very small. The sides are gently rounded, long, and crenulate. The shell is thin along the margins, but elsewhere it is quite thickened. Only one specimen has been found.

Spondylus olsenæ bears some resemblance to *S. coquandianus* d'Orbigny in its narrow, produced right valve, but it is not so greatly produced and the left valve is much more compressed.

Dimensions.—Height 36 mm., length 22 mm., width taken at the apex of the left valve 21 mm.

Type locality.—Found in clay beds about 275 feet above the base of the Glen Rose on the road between Fischer Store and Hancock, Texas, near the latter town.

Superfamily CYPRICARDIACEA Dall
Family PLEUROPHORIDAE Dall
Genus CYPRICARDIA Lamarck
CYPRICARDIA PELLETÆ Whitney, n. sp.
Plate 88, figures 13, 14

Cast small, equivalve, inequilateral, elongate, four-sided. Beaks anterior, small, very close together, rounded at the points. Umbonal margin sloping, straight, flattened. Anterior margin eroded, but appears to be very sloping in the upper portion and narrowly rounded at the lower end. The ventral margin is long and arcuate. The posterior margin is slightly curved, carinate and sloping. The angle between the ventral and posterior sides is acute but broadly rounded. The umbonal ridge is long, slightly arcuate, broadly rounded and low. It becomes less and less distinct as it proceeds obliquely downward toward the posteroventral angle. Very close to the beaks it is faintly carinate. The postumbonal slopes are narrow, slightly concave and together are roughly heart-shaped. The sides are flattened and only slightly convex. Down the middle of the shell from the umbones to the ventral margin there is a broad area which appears to be faintly depressed. The greatest width seems to be slightly posterior to the center on the umbonal ridges. The greatest height is at the beaks. At the angle between the posterior and umbonal margins the shell is considerably lower than at the beaks. The sides are lined by a few irregularly spaced concentric growth lines.

Cypricardia pelletæ resembles *C. compacta* in many respects but differs from it in having a more rounded umbonal ridge; a more sloping umbonal margin; a more rounded posteroventral angle; less demarcation of the juncture between the umbonal and posterior margins; flatter, narrower sides; possesses the faint depression on the flanks and has a different shaped anterior margin.

Dimensions.—Height 13 mm., length 23 mm., width about 8 mm.

EXPLANATION OF PLATE 89

- FIG. 1—*Arca simondsi* Whitney n. sp. $\times 1$. 1, dorsal view. (p. 700)
2–3—*Nucula bybeei* Whitney n. sp. $\times 1$. 2, lateral view, 3, dorsal view. (p. 704)
4–5—*Lucina (Phacoides) horni* Whitney n. sp. $\times 1$. 4, lateral view, 5, dorsal view. (p. 705)
6–7—*Meretrix wellsii* Whitney n. sp. $\times 1$. 6, lateral view, 7, dorsal view. (p. 705)
8–9—*Corbis hamiltonæ* Whitney n. sp. $\times 1$. 8, lateral view, 9, dorsal view. (p. 706)
10–11—*Corbis banderaensis* Whitney n. sp. $\times 1$. 10, lateral view, 11, dorsal view. (p. 706)

Type locality.—Basal Glen Rose on Cow Creek, Burnet County, Texas.

Superfamily NUCULACEA
 Family NUCULIDAE Adams
 Genus NUCULA Lamarck
 NUCULA BYBEEI Whitney, n. sp.
 Plate 89, figures 2, 3

Cast small, elliptical, equivalve, very inequilateral. Beaks almost terminal, small, directed anteriorly, close together, rounded on the point, continuing the even posterior cardinal margin on the posterior side. The hinge is arcuate; no teeth can be seen. Posterior cardinal margin long, arched, high and presenting no concavity behind the beaks. Anterior cardinal margin concave, short. Anterior end thickened, narrowly rounded. Ventral margin arcuate. The posterior margin seems to have been rounded, but has been eroded in the specimens at hand. It is much higher than the anterior margin. The height of the shell is more than half its length. The highest portion is about in the center of the shell. The sides are moderately inflated and the shell seems to be fairly thick throughout except for the thin posteroventral portion. The greatest thickness is a little above the center of the shell. The pallial line is entire and arcuate. The posterior muscle scars are not apparent on the specimens at hand because of their damaged posteriors. The anterior muscle scars are long, lanceolate, oblique and raised on the posterior side. No ornamentation is shown on the sides of the cast.

Dimensions.—Height 21 mm.; length about 31 mm.; width 15 mm.

Type locality.—One mile east of Bandera, Texas, *Salenia texana* horizon, lower Glen Rose.

Superfamily ASTARTACEA Dall
 Family ASTARTIDAE d'Orbigny (emend.)
 Genus CRASSATELLITES Krüger
 CRASSATELLITES EIFLERI Whitney n. sp.
 Plate 88, figure 5

Cast elongate, elliptical, equivalve, very inequilateral, large, compressed. The ventral and posterior cardinal margins are practically parallel. Beaks high, prominent, erect, acuminate. Hinge straight and long. Teeth diverging, large, high, and long; impressions deep and narrow. In the right

valve there is a long, thickened lateral tooth, a strong anterior cardinal tooth, a weaker medial tooth, and a long, curved, thin lateral tooth. In the left valve there is no anterior lateral tooth visible. Two cardinal teeth, of which the anterior is the stronger, are present. There also appears to be a posterior lateral tooth. The posterior cardinal margin slopes down abruptly from the beak, flattens out and becomes almost horizontal. The anterior cardinal margin and the anterior and posterior margins of the specimen at hand are imbedded in rock. The ventral margin is gently arcuate. The side of the shell is flattened. The umbonal ridge is wide and rounded. The umbonal slope is quite wide and concave, triangular in outline. The pallial line is elevated, beaded, curving at the anterior end, straight on the ventral side, sharply pointed and acuminate on the posterior end and swings sharply back toward the beaks paralleling the umbonal ridge. The posterior muscle scar is large, transverse, oval, irregular along its borders, depressed posteriorly and ventrally, elevated anteriorly and dorsally, and flattened on the dorsal side where it is in contact with the cardinal margin. The area below the pallial line is flat in the anterior portion but depressed and concave beyond the middle.

Dimensions.—Height 30 mm., length about 70 mm., width 12 mm.

Type locality.—Near the base of the Glen Rose at the big spring on the Guadalupe River, near Cranes Mill, Texas.

Superfamily CARDITACEA Menke
 Family CARDITIDAE Gill
 Genus CARDITA Bruguière
 CARDITA STAFFORDI Whitney, n. sp.
 Plate 88, figures 3, 4

Cast elongate, angular, small, equivalve, inequilateral. Beaks far apart, high, prominent, bluntly pointed, subcentral, directed anteriorly. Hinge with impressions of one cardinal tooth on the right valve and two in the left valve. Posterior cardinal margin short, high, straight. Anterior umbonal margin short, curved and gently sloping. Anterior margin obliquely truncate, short, carinate and denticulate. Ventral margin long, slightly curved, carinate, denticulate. Posterior margin blunt, obliquely truncate,

nearly parallel to the anterior margin which is slightly shorter than the posterior margin. The lower part of the posterior margin is rounded and denticulate, while the upper part is straight. The sides of the shell are quite compressed. The umbonal region is slightly ventricose. The anterior muscle scars are oval, raised and close to the anterior margin. The posterior muscle scars are oval, raised, situated on the postumbonal slope at the angle between the umbonal margin and the posterior margin.

Dimensions.—Height 37 mm., length 47 mm., width 23 mm.

Type locality.—Speck's Crossing of the Guadalupe River, Comal County, Texas; basal Glen Rose.

Superfamily VENERACEA Menke

Family VENERIDAE Leach

Genus MERETRIX Lamarck

MERETRIX WELLSI Whitney, n. sp.

Plate 89, figures 6, 7

Cast rotund, subovate, small, equivalve, inequilateral. Beaks high, slightly subcentral, pointed, incurved, directed anteriorly, close together. Hinge arched, indented with the impressions of cardinal teeth. Posterior cardinal margin convex, arched, long, steep. Anterior cardinal margin short, concave. Anterior, ventral and posterior margins similar, broadly rounded, and presenting a continuous curvature in the shape of a hemisphere. The margins are slightly gaping in the specimen at hand. The pallial line is marked by short, vertical ridges and grooves. The pallial sinus is deep, fairly wide, directed upward, sides converging in a narrowly rounded point at the anterior end. Anterior muscle scar oval, slightly oblique, attenuated, and produced posteriorly for a short distance along the anterior cardinal margin. The scar is marked by coarse, arcuate, vertical lines. The posterior muscle scars are not visible on the specimens at hand. The greatest height is at the beaks and the greatest thickness is slightly above the center of the shell.

Meretrix wellsi differs considerably from *M. hanseni* Whitney and *M. texana* (Conrad) in its shape. Where the two latter species have a long arcuate ventral margin, *M. wellsi* has a short ventral margin equal in length and curvature to the anterior and posterior margins. It also has a much

steeper cardinal margin and is higher than long.

Dimensions.—Height 39 mm., length 35 mm., width 25 mm.

Type locality.—Boerne-Bandera road 12 miles from Boerne, Texas. Collected by John W. Wells.

Genus TAPES Megerle

TAPES BAKERI Whitney, n. sp.

Plate 88, figures 6, 7

Cast oval, short, small, thin, equivalve, inequilateral. Beaks high, pointed, incurved, directed anteriorly subcentral, close together. Hinge long curved, appears to have three teeth to each valve. Posterior cardinal margin long and arcuate. Anterior cardinal margin short and narrowly concave. Anterior margin carinate, thin, fairly broadly rounded. Ventral margin quite long, arcuate and curving gently to the anterior and posterior margins. Posterior margin more broadly rounded than the anterior margin. Pallial line depressed, arcuate. Pallial sinus deep, fairly wide, rounded on the anterior end, directed upward. Posterior muscle scar oval, flat. Anterior muscle scar oval, slightly raised on some specimens. Sides smooth, very slightly inflated near the beaks, compressed near the ventral margin. Greatest height at the beaks.

Tapes bakeri resembles *T. decepta* (Hill), but is not so long; is more rounded; has a more arcuate ventral margin, a shorter and more concave anterior cardinal margin, a shorter posterior cardinal margin and is proportionately thicker.

Dimensions.—Height 24 mm., length 28 mm., width 13 mm.

Occurrence.—Abundant throughout the Glen Rose. Found at Bandera, Texas and near Fischer Store, Texas and many other places.

Type locality.—Fischer Store-Crane's Mill road, in road cut one-half mile from Fischer Store.

Superfamily LUCINACEA Anton (emend.)

Family LUCINIDAE Fleming

Genus LUCINA Bruguière

LUCINA (PHACOIDES) HORNI

Whitney n. sp.

Plate 89, figures 4, 5

Cast small, compressed, subcircular, equivalve, almost equilateral. Beaks small, not

prominent, central, very slightly turned toward the anterior, very close together. Hinge unknown. The anterior and posterior cardinal margins nearly equal in length and sloping. Anterior cardinal margin slightly concave. Posterior cardinal margin straight. Anterior, ventral and posterior margins thin and arcuate; together forming about two-thirds of a circle. The curvature is quite uniform up to the cardinal margins where it flattens out. The posterior is marked by a very faint umbonal ridge which extends from the beaks to the posterior border leaving a narrow, triangular postumbonal slope. Pallial line long, arcuate, entire. Sides of shell show a few concentric, fairly coarse lines. Greatest thickness about the center of the shell. Greatest height at the beaks.

Dimensions.—Height 24 mm., length 28 mm., width 10 mm.

Occurrence.—Northwest of Bandera, Texas on the Hansen ranch; on Little Blanco River on Smithson's Valley-Twin Sister Mountain road; Cranes Mill-Fischer Store road, three miles from Fischer's Store, Texas, 290 feet above Guadalupe River; on the Devil's Backbone ridge near the top of the Glen Rose in Hays County, Texas.

Type locality.—Devil's Backbone ridge, Hays County, Texas.

Genus CORBIS Cuvier

CORBIS HAMILTONAE Whitney, n. sp.

Plate 89, figures 8, 9

Casts large, exceedingly ventricose, height, length and width nearly equal, equi-valve, only slightly inequilateral. Beaks nearly central, directed anteriorly, large, rounded, incurved. Hinge arched, warped at the anterior end, showing impressions of two teeth in each valve. Posterior cardinal margin long, steeply sloping, convex, curving evenly to the tips of the beaks. Anterior cardinal margin deeply concave; short, steep, almost vertical. Anterior and posterior margins narrowly rounded, similar in shape and size. Ventral margin broadly rounded, keel-like, crenulate. The pallial line is arcuate, paralleling the ventral margin. Beneath the margin the border of the shell is quite thin, but above it the shell expands suddenly to a great thickness. The greatest height is at the beaks. The greatest thickness is at the center of the shell. No

surface markings can be seen on the cast at hand.

Dimensions.—Height 47 mm., length 52 mm., width 43 mm.

Type locality.—Twelve miles south of Boerne, Texas on the Boerne-Bandera road, lower Glen Rose.

CORBIS BANDERAENSIS Whitney, n. sp.

Plate 89, figures 10, 11

Cast subovate, moderately large, very ventricose, equi-valve, inequilateral. Beaks blunt, rounded, far apart, quite high, prominent, anterior but twisted very slightly toward the posterior. Hinge with deep and wide impressions of teeth, one showing small grooves along the hinge. Posterior cardinal margin long, quite straight, curved at the outer end. Anterior cardinal margin shorter, arched, steeply sloping and carinate. Anterior margin very short and rounded. Anterior end greatly thickened. Ventral margin profoundly rounded, somewhat carinate, and denticulate. Posterior margin broadly rounded, closed. Posterior end only slightly thinner than the anterior end. The whole shell is greatly inflated. The thickest portion is somewhat below the beaks. The highest portion is at the beaks. Umbonal ridge slightly prominent. Post-umbonal slope wide, concave. The pallial line is entire. Anterior muscle scar large, oval, raised on the posterior side. The posterior muscle scar is situated high on the post-umbonal slope, suboval, produced for a short distance up the posterior cardinal margin, marked by curved longitudinal lines and raised on the anterior side. No surface markings are present on the cast.

Corbis banderaensis differs from *C. hamiltonae* in having its beaks very terminal and by being slightly less ventricose.

Dimensions.—Height 50 mm., length 60 mm., width 45 mm.

Type locality.—At the *Salenia texana* horizon on the Hansen ranch 9 miles northwest of Bandera, Texas; upper portion of basal Glen Rose.

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