

NEW LAND AND FRESH-WATER MOLLUSKS FROM CENTRAL AND SOUTH AMERICA

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Eight of the eleven new species here described were received from various correspondents during the last few months. The other three were brought to light in revising the Museum collections. Two of the species are from Central America, the others from South America.

ODONTOSTOMUS (CYCLODONTINA) CHASEAE, new species

Plate 1, fig. 8

Shell thin, slender, elongate; whorls eight and one-half, very slightly rounded, subrenulate along the sutures, which are impressed; sculpture consisting of many fine, flexuous, retractive lines of growth. First four (nepionic) whorls corneous, the apical whorls regularly grated like finely woven wire. Color yellowish white, with irregularly placed, retractive streaks of chestnut, and a faint, narrow white band on the periphery. Aperture about two-fifths the length of the shell, its sides parallel to the axis, its basal portion nearly semi-circular. Lip expanded throughout its course, being narrowly expanded at the upper end of the outer lip, the expansion regularly increasing from there to the upper end of the columellar lip, at which point a minute portion is suddenly reflected toward the umbilicus. Lip white, a brown band just within the aperture from the upper corner of the outer lip to and including the lower edge of the broad fold or tooth on the columella, and another brown stripe farther within; and a faint spiral band within the aperture, corresponding to the faint peripheral band on the exterior. Parietal wall with a small callus at the end of the outer lip and another at the end of the columellar lip; a small, platelike tooth near the middle of the parietal wall, a low tooth, or rather a swelling at the middle point of the outer lip, another similar but slightly larger tooth near the middle of the basal portion of the lip, and a strong, platelike, broad, twisted tooth near the upper end of the columella. Umbilicus

blackish, narrow, the base of the shell below it spirally angulated. Behind the aperture are two short constrictions. The upper one at the end of the faint white peripheral spiral line, and giving rise to the small tooth or swelling just within the outer lip at its middle point; the lower one giving rise to the small tooth just within the basal portion of the lip.

The type (Cat. No. 362151, U.S.N.M.) measures: Length, 25 mm.; diameter, 9.5 mm.; length of aperture 9 mm. It and six paratypes (Cat. No. 362152, U.S.N.M.) were presented by Mrs. Agnes Chase, who collected them "on bare cliffs of rock, north face of Paulo Affonso Falls in Rio São Francisco, State of Alagoas, Brazil, December 1, 1924."

The State of Alagoas lies between the States of Pernambuco on the north and Sergipe on the south; and Paulo Affonso Falls are about 140 miles above the mouth of the São Francisco.

The species is most nearly related to *Odontostomus (Cyclodontina) inflatus* Wagner, but is much more slender, has much stronger growth riblets, and has the teeth, especially those on the outer lip, much smaller.

ODONTOSTOMUS (CYCLODONTINA) IHERINGI, new species

Plate 1, fig. 10

Shell rather strong, fusiform-turritid; whorls seven and one-half, somewhat rounded; sculpture of many strong, flexuous retractive growth riblets, the upper ends of which subcrenulate the sutures; apical whorls finely grated. Color faded, but on the back of the body whorl enough color remains to show that there was a chestnut strigation at that point, and that the whorl just back of the lip was chestnut. Aperture about two-fifths the length of the shell, is sides parallel to the axis, lip white, expanded all round, a moderately thick callus across the parietal wall. Channel at upper end of outer lip and that at upper end of columellar lip obsolete. Aperture nearly filled with teeth of which there are eight as follows: A minute tooth at the left end of the parietal wall, a large heavy tooth to the right of the middle of the wall, two small fairly acute teeth in the upper portion of the outer lip, followed by a very heavy drooping tooth reaching more than halfway across the aperture at the middle of the outer lip, base of lip with two platelike teeth, the one to the right being the larger and a heavy drooping triangular tooth on the columella. Edges of all the teeth white, the sides of the heavy tooth on the outer lip, the sides of the two basal teeth and the lower side of the columellar tooth brown; umbilicus narrow, the base of the shell below it spirally angulated. Behind the aperture are two short, deep constrictions, the upper one giving rise to the large tooth

at the middle of the outer lip and the lower one giving rise to the larger of the two basal teeth.

The type (Cat. No. 362153, U.S.N.M.) measures: Length, 20 mm.; diameter, 7 mm.; length of aperture, 8 mm. It and a paratype (Cat. No. 194201, U.S.N.M.) come from Goyaz, Brazil, and were presented by Dr. H. von Ihering, who says they were collected by Baer in 1906.

The nearest relative of this species is *Odontostomus (Cyclodontina) scabrellus* Anthony, which is longer, more slender, has heavier axial riblets, a distinct channel at the upper end of the outer lip and one at the end of the columellar lip, and has only 7 teeth, each of which is smaller than the corresponding tooth of *iheringi*.

SUCCINEA FELIPPONEI, new species

Plate 1, fig. 4

Shell rather thick, inflated, ovately globose, with very large aperture. Whorls $3\frac{1}{2}$, descending slowly, the body whorl about four-fifths the length of the shell. Suture well impressed. Sculpture consisting of a number of riblike, slightly retractive lines of growth marking former locations of the outer lip, and lesser growth lines on and between these riblets. General color pale creamy, with a dark line just back of and emphasizing each principal growth line, the interior with the same colors as the exterior. Aperture oval, two-thirds the length and three-fifths the diameter of the shell, a prominent callus on the parietal wall running down to the midpoint of the columella.

The type, U.S.N.M., Catalogue No. 362976, measures: Length 14.5 mm.; greater diameter, 9.5 mm.; lesser diameter, 6 mm.; length of aperture 10 mm.; width of aperture 6 mm. It and a paratype, Cat. No. 362977, U.S.N.M., come from the Carrasco, Department of Montevideo, Uruguay, and were presented by Dr. Florentino Felippone.

The inflated form, the riblike growth lines, and the dark longitudinal markings on the creamy background make this a well-marked species.

AMPULLARIA SUPERBA, new species

Plate 1, fig. 9

Shell imperforate, turbinate, rather thick; whorls six in number, well rounded, body whorl very large; sutures well impressed, narrowly margined. Surface apparently smooth and glossy, but a lens reveals a minute axial sculpture of numerous growth striae and a number of revolving lines made up of very fine granules. The periostracum of the two earliest whorls is eroded; on the next two whorls it is fairly well preserved and shows that it bore numerous revolv-

ing granulose striae. With sufficient magnification the granules are seen to be > shaped, with the point directed toward the right-hand side of the whorl. Most of them are of a rich chestnut color and in spots where large numbers of them are preserved they give a velvety appearance to the surface. Aperture large, about seven-tenths the length of the shell, its outer lip flaring, its columellar lip thick and rounded and so formed at its upper end as to have the appearance of covering an umbilicus; parietal wall with a thick, white callus. General color ashy and brownish, with many revolving, chestnut-colored bands, which show prominently on the inner portion of the outer lip and less distinctly for some distance within the shell.

The type, Cat. No. 362863, U.S.N.M., measures: Length, 53 mm.; diameter, 43 mm.; length of aperture, 36 mm.

It comes from Cienaga Totuma, Department of Atlantico, United States of Columbia and was collected and presented by T. A. Link. Its nearest relative is *Ampullaria pealeana* Lea, than which it is much larger, more globose, thicker, of darker colors and has more numerous bands.

In addition to the fine axial sculpture of growth striae mentioned in the description there is a still finer axial sculpture, which shows in spots, especially above the suture, and which requires a compound microscope to reveal it. This sculpture consists of flattened threads, of which there are some 75 to the millimeter and seems to be in the calcareous portion of the shell and not in the periostracum. The threads are about three times as wide as the intervening spaces and are so uniform in width that apparently they were formed with mathematical precision. This sort of structure has been found in a number of species of *Ampullaria* and probably each thread represents the unit of advance in growth of the shell.

NEPHRŌNAIAS LEMPENSIS, new species

Plate 2, figs. 4, 6; plate 3, fig. 4

Shell rather compressed, nearly elliptical in outline, rounded at both ends, the posterior end very slightly narrower than the anterior. Dorsal and ventral margins about equally curved, both of them rounding into the anterior and posterior margins as in an ellipse and with no tendency to an angle of any kind. Shell rather thin at the posterior end, moderately thickened at the antero-ventral portion. No distinct anterior and posterior ridges, the disk of the valve blending gradually into the anterior and posterior dorsal areas, the descent at front being rapid, at the rear gradual. Beaks low, eroded, located at the anterior third of the shell. Periostracum somewhat clothlike, not glossy, but with a slight sheen. Color nearly uniform chestnut, with faint indications of rays of green. (In younger

shells these rays are quite evident.) Sculpture consisting of three well-marked concentric lines of growth with a number of small concentric striae between them. Beak cavities shallow, with a line of muscle scars at the front portion. Anterior adductor scars deep, with a pair of minor muscle scars back of them; posterior adductor scars shallow, but perceptible to the touch. Right valve with two pseudocardinal teeth, the inner one large, the outer one very small and platelike, with a narrow groove between the two teeth. The left valve also with two pseudocardinals set obliquely one behind the other and rather ragged. One lateral tooth in the right valve, two in the left valve, all of them obliquely striated in a generally longitudinal direction. Nacre pearly, with scarcely any iridescence, of a generally bluish cast, but with a pinkish or flesh-color tinge in the antero-ventral region. Prismatic border very narrow, less than a millimeter in width.

The type, Cat. No. 361764, U.S.N.M., measures: Length, 53 mm.; height, 30 mm.; diameter, 15 mm. It comes from the Rio Lempe, Salvador, at the railroad bridge and was collected February 9, 1924 by Hildebrand and Foster, under the auspices of the United States Bureau of Fisheries. In addition to the type there are five other specimens, Cat. No. 360388, U.S.N.M., collected at the same time and same place. They are exactly like the type except in size and, in the young specimens, the rays of green color.

This species is closely related to *Nephronais rowellii* Lea, from which it differs in being much more compressed, in being thinner, in having the beaks nearer the anterior end, and in being more nearly elliptical.

ELLIPTIO DIVARICATUS, new species

Plate 1, figs. 1, 2; plate 3, fig. 3

Shell compressed, subrhomboid, rounded and narrower in front, wider, obliquely truncate, and obscurely biangulate posteriorly. Beaks located at about the anterior third of the length. Dorsal and ventral margins slightly curved. Posterior ridge low but prominent, slightly riblike to the touch, accentuated by a radiating stripe of color darker than the body of the shell. Color ashy olive, lighter in the anterior portion. Posterior dorsal area with three radiating stripes of smoky tinge, the lowest one on the dorsal ridge. Sculpture of four concentric impressed lines marking rest periods in growth and most of the surface covered with radiating, more or less interrupted riblets. At the anterior end the riblets are absent, on the posterior ridge they bifurcate, and on the posterior dorsal area they curve gently toward the margin. Nacre with a light coppery tinge of color, and slightly iridescent in the posterior portion. Somewhat thickened in front. Beak cavities shallow. An-

terior adductor scars deep and rough; the posterior ones nearly superficial and smooth. Pallial line well marked, about 3 mm. from the ventral margin; prismatic border very narrow. Right valve with a single pseudocardinal tooth, and a single lateral somewhat remote from the beak; left valve with two pseudocardinal teeth, the inner one the larger, and the space between them shallow, broad. Lateral teeth in both valves obliquely striated and grooved.

The type, Cat. No. 362398, U.S.N.M., measures: Length, 32.5 mm.; height, 20 mm.; diameter, 11 mm. It comes from Finca de Providencia, Guatemala, and was received without name from H. Rolle, of Berlin, Germany.

The nearest relative to this species is *Quadrula guatemalensis* Simpson. The genus *Quadrula* does not seem to be the proper allocation for *guatemalensis* nor for the present species, which is here placed doubtfully in the genus *Elliptio*, to remain until the true generic positions of the Mexican and Central American granulous Maiads are finally determined.

Cat. No. 362399, U.S.N.M., includes a paratype, in which the granulation is not quite so abundant and on which there are two very broad dark radiating rays which are made up of many very fine greenish radiating lines. It measures: Length, 38 mm.; height, 22.5 mm.; diameter, 13 mm.

TETRAPLONDON LINKI, new species

Plate 1, figs. 6, 7; plate 3, fig. 2

Shell subrhomboid, rather thick, subinflated, beaks about the middle of the dorsal line, posterior end obliquely truncate, anterior end narrower and rounded. Posterior dorsal ridge moderately high, subangulate. Hinge line straight, slightly oblique, ventral margin a little arcuate. Sculpture consisting of 28 radiating ribs, which are narrow and subnodulous on the anterior and posterior areas, smooth, wide and low on the middle portion of the shell; concentric sculpture of many raised growth striae which are emphasized on the radiating ribs; three rest periods indicated. Color uniform ashy olive. Interior pearly, iridescent at posterior portion, bluish white, having an appearance of being numerous, finely, radiately striate; anterior adductor scars deep, posterior scars superficial, prismatic border a mere line. Right valve with two pseudocardinal teeth, the inner one the larger, and with three small denticles behind it on the hinge area; left valve with one pseudocardinal tooth split into about five denticles. Right valve with one lateral tooth which is short and has many vertical striae on its inner and outer faces; left valve with two lateral teeth, the inner one much the larger and strongly vertically ribbed on its upper face.

The type (Cat. No. 362860, U.S.N.M.) measures: Length, 25.5 mm.; height, 19 mm.; diameter, 15 mm. It comes from Sinu River at Lorica, Province of Bolivar, United States of Colombia, South America, and was collected and presented by Theodore A. Link of the Tropical Oil Co. Lorica is in the northwestern corner of Colombia, near the mouth of the Sinu River, which empties into the Gulf of Morosquillo, an arm of the Gulf of Darien, Caribbean Sea.

The lot sent by Mr. Link included also fifteen-odd valves (Cat. No. 362861, U.S.N.M.). Some of these are older and larger than the type, the largest measuring: Length, 42 mm.; height, 28.5 mm. These larger specimens show that the radiating ribs are not developed or have a tendency to become obsolete in the portion of the shell formed after the size of the type has been attained.

The only species to which this is closely related is *Tetraplodon ecarinata* Mousson, which occurs in the Magdalena River, United States of Colombia. *Ecarinata* is less elongate, of rounder form, has the ventral margin more arcuate and the radiating ribs rounded instead of flattened.

HYRIA WHEATLEYI, new species

Plate 1, figs. 3, 5; plate 3, fig. 1

Shell small, solid, somewhat inflated, subrhomboid, wide and nearly squarely truncate posteriorly, narrow and oblique anteriorly; very slightly alate at both ends. Hinge line slightly arched; posterior and anterior margins making distinct (nearly right) angles with the dorsal margin. Ventral margin curved, sloping rather sharply into the anterior margin which is very short. Greatest diameter at the center of the shell, anterior ridge lacking, posterior ridge high, rounded, made to appear sharp by one of the radiating ribs of the beak sculpture running along its summit. Concentric sculpture of fine striae with two rest periods accentuated by a dark line. Beak sculpture radial, very bold and regular, consisting of 16 continuous principal ribs, one on the posterior ridge and the others anterior to it, and several interrupted minor riblets on the posterior dorsal area. The six middle ribs are arranged into three "nested" pairs, the two ribs in each pair converging and pointing ventrally. If continued other ribs would converge in pairs thus "nested." Interior iridescent pearly, appearing to be finely, radially striated, the striae more marked along the ventral margin. Pseudocardinal teeth of right valve two, the inner one large and divided into four denticles; the outer one small, low and linear. Pseudocardinal of left valve with a large socket. Lateral tooth of right valve high, slightly curved, obscurely striated, vertically and obliquely. The two lateral teeth of left valve distinctly obliquely striated, the inner tooth the higher. Anterior adductor scars deep, especially at the

upper part; posterior adductor scars well marked but shallow. Pallial line about 5 mm. from the margin. Prismatic border a mere line.

The type, Cat. No. 85336, U.S.N.M., measures: Length, 25 mm.; height, 19 mm.; diameter, $12\frac{1}{2}$ mm. It came from Rio Negro, 1,200 miles up the Amazon. It is part of the Isaac Lea collection.

Dr. I. Lea identified this species as *Unio wheatleyanus* Lea, and Simpson arranged it in that species in the genus *Diplodon*. It is true that it bears some resemblance to that species, but careful comparison with the type of *D. wheatleyanus* shows that it does not belong there, and the angular junctions of the anterior and posterior margins with the dorsal margin, the alate character of the two ends of the hinge line, though slight, and the style of beak sculpture lead to the belief that it belongs in the genus *Hyria*. Its habitat in the Amazon further strengthens the belief that it is a *Hyria*. Lea's type of *Diplodon wheatleyanus* came from Montevideo, Uruguay. Perhaps the most striking difference between the two is in the beak sculpture, which in *Diplodon wheatleyanus* is divergent while in *Hyria wheatleyi* it is convergent. Judging by its small size and few rest periods the type of this new species is probably immature. It is old enough to show that it differs from all the species hitherto described, especially in its moderately inflated form, the regularity of the beak sculpture, and the slight alateness of the ends of the hinge area.

DIPLODON ASUNCIONIS, new species

Plate 2, figs. 2, 8; plate 3, fig. 5

Shell solid, elongately ovate, slightly nasute, somewhat inflated, rounded and narrower in front, truncate and wider behind; dorsal and ventral margins subparallel, lightly curved. Anterior ridge not distinctly differentiated; posterior ridge high and sharp near the beak, gradually flattening out and becoming nearly obsolete as it approaches the margin. Anterior area full, rapidly descending from the disk of the shell; posterior area somewhat concave. Anterior margin rounding into the dorsal and ventral margins; posterior margin making an obtuse angle with the dorsal margin, and a blunt point with the ventral margin. Beaks set well forward, somewhat eroded, high, sculptured with 12 very strong radiating ribs which continue to the middle of the shell; anterior area with three sharp, fine, short radiating riblets; posterior area with five similar but longer riblets. General sculpture consisting of indistinct concentric striae with three rest periods accentuated. There are indications of radiating interrupted riblets. Periostacum dull, closely adhering, and of a uniformly rich chestnut color throughout. Nacre whitish, slightly

iridescent posteriorly, thicker in front, an obscure sulcus showing the location of the posterior ridge. Anterior adductor scars very deep; posterior scars well marked but shallow. In the right valve there are two pseudocardinal teeth which are parallel to each other, the outer one the smaller, the inner one transversely subdivided near the beak. In the left valve there is one pseudocardinal divided into three parts, the middle part being small. All the pseudocardinals are strongly striated vertically and the summits are crenulated. Lateral teeth long and slightly curved and obliquely striated; the single one in the right valve being obsoletely vertically striated. The outer one of the two laterals in the left valve is the smaller. Pallial line well impressed, 4 to 5 mm. from the margin. Prismatic border a mere line.

The type, Cat. No. 361959, U.S.N.M., measures: Length, 40 mm.; height, 25 mm.; diameter, 18.5 mm. It comes from the Paraguay River at Asuncion, Paraguay, and was presented by Dr. Florentino Felippone. It classifies between *D. burroughiana* Lea and *D. trifidus* Lea, but is more nearly related to the latter. It differs from *trifidus* in being much less nasute, in being less elongate and more inflated, in color, which in *trifidus* is greenish while in *asuncionis* it is uniformly rich chestnut, and in having the posterior ridge much less sharply angled. In beak sculpture the two species are very similar, but in *asuncionis* it is stronger and the posterior dorsal area near the beaks has five fine, elevated, sharp lines. In *asuncionis* the lateral tooth of the right valve is single as it normally is in the Naiades; but in *trifidus* it is divided lengthwise into three parts, the middle part being large and similar to the usual lateral tooth, the inner being much lower and nearly as long as the middle part, the outer part very small and only about half the length of the middle part. This divided lateral probably suggested the name *trifidus*. The type seems to be the only specimen of *trifidus* ever found, and it may be that the divided lateral is an individual character.

DIPLODON (CYCLOMYA) SMITHI, new species

Plate 2, figs. 1, 7; plate 3, fig. 6

Shell compressed, rather thin, subquadrate, narrower and rounded in front, broad and obliquely truncate in the rear. Surface nearly evenly rounded, with but little convexity and lacking a clearly defined posterior ridge. Posterior area rounding up gently and anterior area more abruptly into the middle portion of the shell. Most of the shell, excepting the anterior and posterior areas, with obscure, coarse, radiating lines similar to those in *D. felipponei* Marshall, *D. funebrale* Lea, *D. patelloides* Lea, and others of that group. Beak sculpture consisting of 12 coarse, radiating ribs, the

two middle ones joining to form a V. Rest periods about seven indicated by stronger grooves than those of the minor concentric sculpture and by a concentric darkening of color. Color chestnut brown, the posterior half darker than the anterior. Periostracum glossy, paperlike, tending to peel at the posterior margin. Prismatic layer very thin, about the same thickness as the periostracum and peeling with it. Nacre silvery white, slightly iridescent at the posterior portion, an indistinct groove from the beak to the ventro-posterior corner. Anterior adductor scars deep, posterior scars superficial. Pallial line indistinct, about 10 mm. from the ventral margin. Prismatic margin very narrow. Pseudocardinal teeth rather thin, platelike, set nearly parallel to the dorsal margin. In the right valve the outer tooth is the smaller while in the left valve it is the larger. Just under the beak in each valve is a third portion of the pseudocardinal, small and set transversely to the hinge line. The lateral teeth are somewhat bowed, the single lateral of the right valve being very high and thin. Of the two laterals in the left valve the inner is the larger and the groove between the two teeth is deep and narrow. All the lateral teeth are crenulate and much striated.

The type, Cat. No. 363027, U.S.N.M., measures: Length 76 mm.; height, 52 mm.; diameter 26 mm. It comes from Tigre River, Tigre, Buenos Aires, Argentina. Cat. No. 348794, U.S.N.M., includes two younger specimens from the same place. All three specimens were collected and presented by Dr. Hugh M. Smith, for whom the species is named.

ANODONTITES IRISANS, new species

Plate 2, figs. 3, 5; plate 3, fig. 7

Shell elongate-oblong, compressed, rather thick, rounded and narrower in front, truncately rounded, wider and somewhat nasute behind; dorsal margin lightly arcuate, making an indistinct, very obtuse angle with the posterior margin and rounding into the anterior margin. Ventral margin nearly straight, sloping gently upward toward and fading into the anterior margin without any angle. Anterior area descending rapidly from the body of the shell without a ridge; posterior area gently sloping, the posterior dorsal ridge low and rounded. Posterior dorsal area with a faint rib running from the beak to just above the posterior ventral angle. Surface nearly smooth but with many fine concentric growth lines and a few heavier lines marking rest periods of growth. Anteriorly and posteriorly the fine growth lines are more prominent, forming fine lamellae. To the unaided eye there are faint indications of radiating striae. With a fairly high power microscope the periostracum shows innumerable radiating threads. Color chestnut brown throughout. Interior brilliantly pearly, very iridescent along the anterior, posterior, and

ventral portions and especially in the adductor scars. General color of interior bluish. Anterior adductor scar moderately deep posterior scar nearly superficial; prismatic margin very narrow and of a dark olive color. Pallial line very feebly marked, about 8 mm. from the margin.

The type, Cat. No. 359920, U.S.N.M., measures: Length, 70 mm.; height, 39 mm.; diameter, 32 mm. It comes from Venezuela and was received from Mrs. T. S. Oldroyd, of Leland Stanford University, to whom a paratype was returned.

Except for the differences in the character of the hinge this shell in both internal and external features is almost an exact counterpart of specimens of the common *Elliptio complanatus* of the United States. Its nearest relative is *Anodontites leotaudi* Guppy, which comes from the island of Trinidad.

NOTE ON DIPLODONTITES COOKEI MARSHALL

A specimen, Cat. No. 362862, U.S.N.M., of this species, received from Theodore A. Link, came from the Quebrado Perro, an affluent of the Rio San Jorge, which becomes tributary of the Rio Cauca which later joins the Rio Magdalena, about 200 miles above its mouth. This locality is in the Province of Bolivar, United States of Colombia. The locality of the type lot, the only other specimens known, is in a tributary of the Rio Colorado, an affluent of the Rio Magdalena in the Province of Santauder, United States of Colombia. While the known geographic range of the species is extended by the specimen from Link it remains confined to tributaries of the Rio Magdalena.

This specimen measures: Length, 66 mm.; height, 37 mm.; diameter, 29 mm. The largest specimen heretofore known, a paratype, measures: Length, 56 mm.; height, 32 mm.; diameter, 20 mm. The specimen from Link has the appearance of being a very old shell. It has the sculpture and the exact colors of the type, but the ventral edge is somewhat arcuate and the valves widely gape anteriorly. At that point each valve has a shelly growth attached along the inner edge of the prismatic border, forming a little shelf about 17 mm. long and 6 mm. wide, reaching inward as far as the pallial line. Its free edge is dark and resembles a prismatic border and may be one. Its exposed surface has fine striae like those in the periostracum of the shell. The indications are that the edges of the mantle were turned back and continued a shell growth directed toward the beaks instead of away from them.

EXPLANATION OF THE PLATES

PLATE 1

- FIG. 1. *Elliptio divaricatus*. Right valve. Type.
2. *Elliptio divaricatus*. Left valve. Type.
3. *Hyria wheatleyi*. Right valve. Type.
4. *Succinea felipponei*. Type.
5. *Hyria wheatleyi*. Left valve. Type.
6. *Tetraplodon linki*. Right valve. Type.
7. *Tetraplodon linki*. Left valve. Type.
8. *Odontostomus (Cyclodontina) chaseae*. Type.
9. *Ampullaria superba*. Type.
10. *Odontostomus (Cyclodontina) iheringi*. Type.

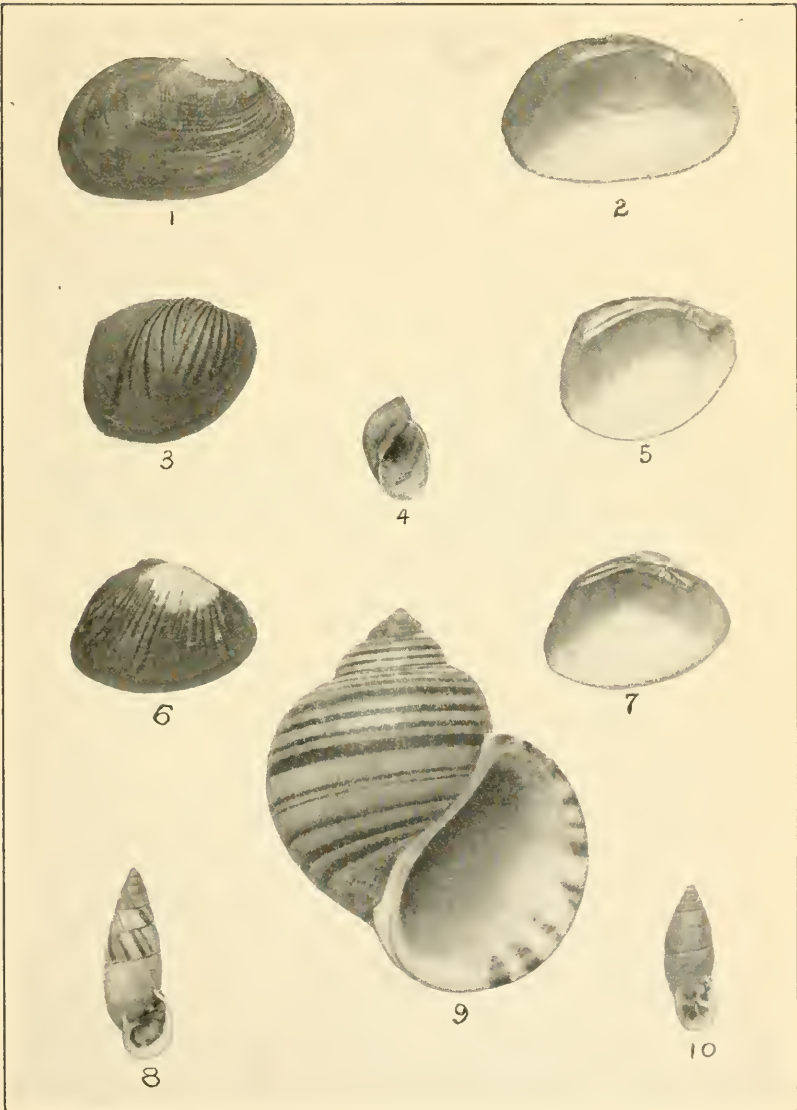
PLATE 2

All figures three-fourths natural size

- FIG. 1. *Diplodon (Cyclomya) smithi*. Left valve. Type.
2. *Diplodon asuncionis*. Left valve. Type.
3. *Anodontites irisans*. Right valve. Type.
4. *Nephronaias lempensis*. Right valve. Type.
5. *Anodontites irisans*. Left valve. Type.
6. *Nephronaias lempensis*. Left valve. Type.
7. *Diplodon (Cyclomya) smithi*. Right valve. Type.
8. *Diplodon asuncionis*. Right valve. Type.

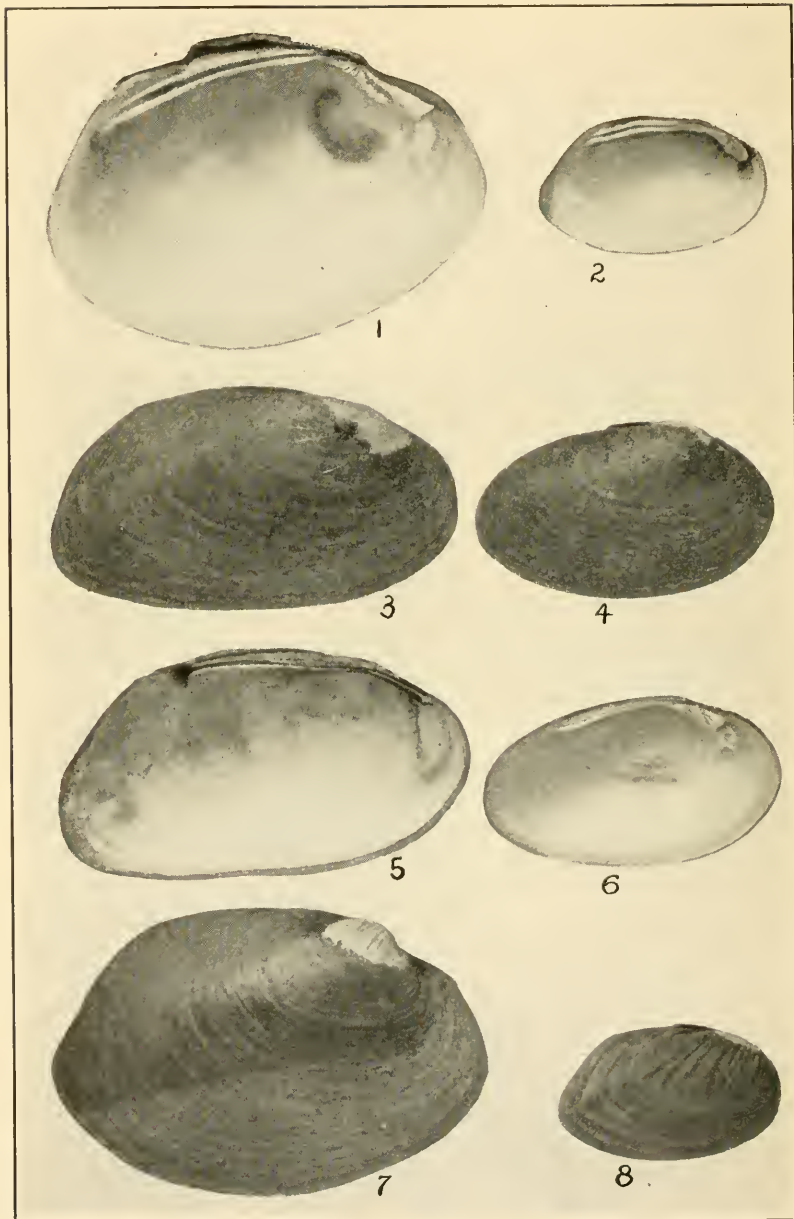
PLATE 3

- FIG. 1. *Hyria wheatleyi*. Dorsal view. Type.
2. *Tetraplodon linki*. Dorsal view. Type.
3. *Elliptio divaricatus*. Dorsal view. Type.
4. *Nephronaias lempensis*. Dorsal view. Type.
5. *Diplodon asuncionis*. Dorsal view. Type.
6. *Diplodon (Cyclomya) smithi*. Dorsal view. Type.
7. *Anodontites irisans*. Dorsal view. Type.

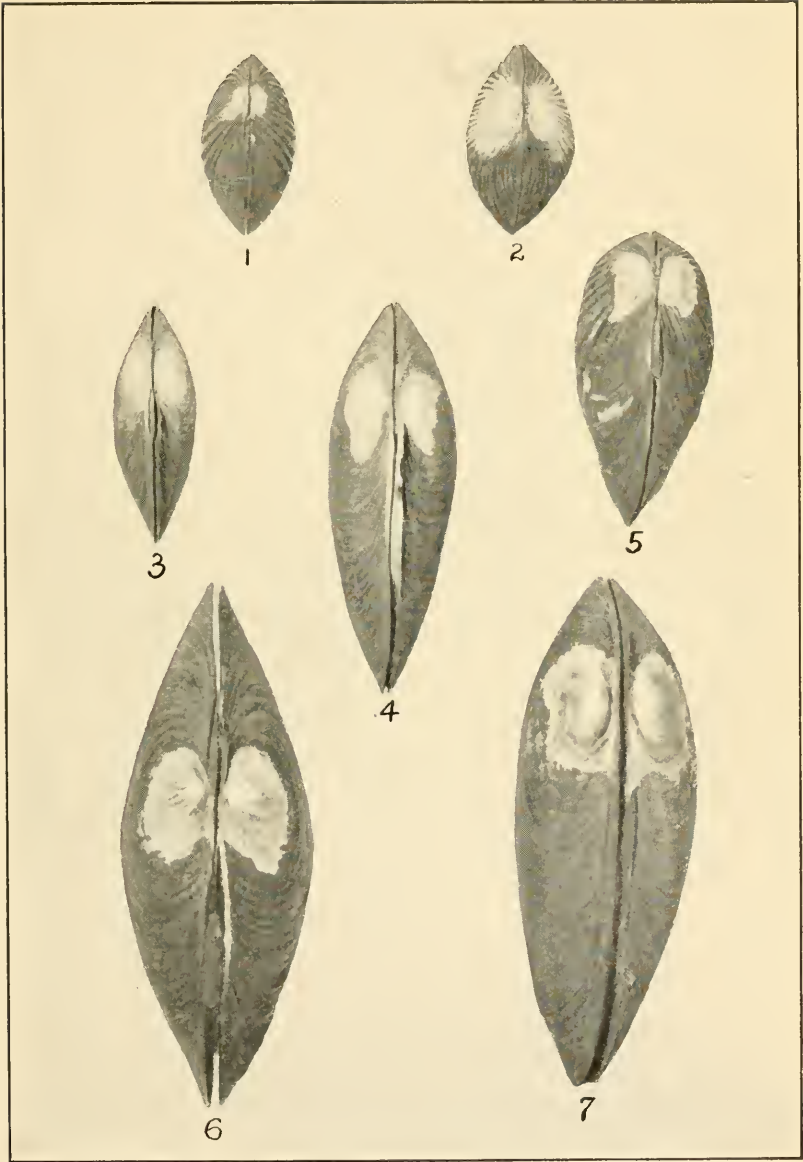


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