
Subsection Zoology

The Recent Gastropoda of Oklahoma, Part IV. Terrestrial Species, Families Polygyridae and Bulimulidae

BRANLEY A. BRANSON, Department of Biology

Kansas State College, Pittsburg

ADDENDA During the last year *Viviparus subpurpureus* (Say) (Branson, in press) was added to the known aquatic snail fauna of Oklahoma. It can be distinguished from the two exotic forms known from the state by its thinner shell and much darker periostracum, which is purplish brown rather than olivaceous.

ERRATA On page 14, Part II (Branson, 1961), fourth line from bottom, read "(J. Q. Burch, 1956)" for "Burch, 1958)".

INTRODUCTION The following is a continuation of part III (Branson, 1961). The only special terminology herein required is for the shell teeth in the Polygyridae. When the shell is held so that the aperture is on the right and the spire directed upward, the lowermost lip tooth is termed the basal tooth; the upper one is the outer. The plait on the basal columellar region is the parietal.

FAMILY POLYGYRIDAE

Shell small to capacious, brownish to brownish-white; lenticular, discoidal, globose, or globose-conoidal; dextral, hemiomphalous, cryptomphalous or phaneromphalous; whorls convexly involuted; sculpture varies from nearly smooth to heavily rib-striate, faint revolving lines common; some forms hirsute; sutures moderately to deeply incised; peristome reflected and continuous; animal varying shades of tan, brown, orangish or nearly black above; with a whitish foot; tentacles relatively slender; jaw

heavily ribbed; central and lateral radular teeth with ectocones; marginals with bifid central denticulations; protandrous oviparous, mycophagous and mainly nocturnal hermaphrodites; four primarily eastern genera and 17 species reported from Oklahoma.

KEY TO GENERA OF OKLAHOMA POLYGYRIDAE

1 a. Shell lenticular; aperture basal; parietal tooth very long ..... *STENOTREMA*
b. Shell neither lenticular nor with a basal aperture 2

2 a. Aperture with 1 or 3 teeth 3
b. Aperture toothless 6

3 a. Aperture with parietal tooth only ..... *MESODON* (in part)
b. Aperture with three teeth 4

4 a. Umbilicus large, round and deep; heavily sculptured ..... *TRIODOPSIS* (in part)
b. Umbilicus covered, or if round and deep, shell smooth 5

5 a. Shell cryptomphalous ..... *MESODON* (in part)
b. Shell with umbilicus at least partly open or shell small and hirsute ..... *POLYGYRA*

6 a. Shell umbilicate ..... *MESODON* (in part)
b. Shell cryptomphalous 7

7 a. Lip, adjacent to umbilical region, bears a long tooth-like ridge (parallel to lip) (Fig. 18) ..... *TRIODOPSIS* (in part)
b. Lip not so modified 8

8 a. Height greater than 60 per cent of width ..... *MESODON* (in part)
b. Height less than 60 per cent of width 9

9 a. Shell rib-striate ..... *TRIODOPSIS* (in part)
b. Shell smooth or nearly so ..... *MESODON* (in part)

GENUS MESODON Rafinesque, 1821

Shell moderate to large, depressed-conic, globose or globose-conic; tan to dark brown; thick and rather solid to very thin; peristome reflected, edentate or with one or three teeth; cryptomphalous, hemiomphalous or phaneromphalous; animal sculptured, tan, brown, orangish or nearly black; foot creamy or grayish-white. Nine species reported from Oklahoma, but one is synonymized with *Mesodon indianorum*.

KEY TO OKLAHOMA SPECIES OF MESODON

1 a. Three teeth in aperture (may be partially reduced) ..... *Mesodon inflectus*
b. One or no teeth in aperture 2

2 a. Parietal tooth present 3
b. Aperture edentate 6

3 a. Height of shell less than 60 per cent of diameter ..... *Mesodon roemeri*
b. Height of shell more than 60 per cent of diameter 4

4 a. Shell cryptomphalous 5
b. Shell hemiomphalous ..... *Mesodon thyroidus* (in part)

5 a. Basal lip bearing a long flat lamina which is distally truncated ..... *Mesodon elevatus*
b. Basal lip with a very short lamina near its junction with the columella ..... *Mesodon zaletus*

6. a. Height of shell 60 per cent or more of diameter 7
   b. Height of shell less than 60 per cent of diameter 8

7 a. Lip reflected and dished ..... *Mesodon thyroidus* (in part)
   b. Lip reflected but not dished ..... *Mesodon clausus*

8 a. Lip evenly reflected to its insertions ..... *Mesodon indianorum*
   b. Lip becoming straight and relatively thin-edged near upper insertion ..... *Mesodon kiowaensis*

Mesodon thyroidus (Say) Figs. 8, 11

Oklahoma Records: Muskogee County (Brown, 1861); Muskogee and Atoka counties (Simpson, 1888); Choctaw and LeFlore counties (Pilsbry, 1903); Ottawa, Craig and LeFlore counties (Pilsbry and Ferriss, 1906a); Pushmataha and Rogers counties (Lutz, 1949); Cherokee and Pontotoc counties (Wallen, 1951); Kay, Johnston and McCurtain counties (Wallen and Dunlap, 1953); Creek, Haskell, Osage and Sequoyah counties (Branson and Wallen, 1958); Adair and Choctaw counties (Dundee, 1955); Choctaw County (Dundee and Dundee, 1958); Nowata and Delaware counties (Branson, 1959a); Kay, Marshall, Payne and Latimer counties (Branson, 1959b). New Records: Johnston County.

Shell 11.3 to 18.5 mm high, diameter 16.8 to 28.6 mm; orthostrophic, depressed-globose to globose; cryptomphalous to hemiomphalous; 5⅓ to 5⅔ whorls; sutures moderate; color yellowish, greenish-brown, tan or brown (appears mottled because mantle pigmentation shows through shell); nucleus smooth, rest of shell with equally-spaced growth striae crossed by microscopic revolving lines; peristome reflected, except near upper insertion, where it becomes straight; dished and flattened at junction with columella; parietal callus very thin and transparent; parietal tooth present or lacking. Animal brownish or tan above; foot white; tentacles dark at tips.

Since specimens with the configuration of the so-called race *M. thyroidus bucculenta* Gould can be found intermingled with typical *M. thyroidus*, with all degrees of intergradation, this "subspecies" should be relegated to synonymy.

As is well-known (Jones, 1938), a groove in the edge of the mantle ("supra-marginal") secretes the periostracum of the shell. The morphology of this groove may serve as an additional character for separating *M. thyroidus* from *Triodopsis albolabris*, with which it is sometimes confused. In the former it is very narrow and deep, possessing secretory cells (Jones, 1937) which are relatively short, whereas that of *T. albolabris* is broad, shallow and has very long secretory cells.

The penis bears a rather long basal stalk (Webb, 1954), thus differing from the short-stalked one of *M. clausus*. The penis is everted and intertwined with that of another snail during copulation. The female organs are never everted as they are in some triodopsins (Webb, 1947). Since polygyrids possess polyploid chromosome numbers (Husted and Burch, 1946), 2N=58 in all *Mesodon* thus far investigated, it is suggested that some selfing or close inbreeding must occur.

All mesodons are mycophagous (Branson, 1959b; Pilsbry, 1940), primarily nocturnal and greatly restricted by moisture availability, becoming quickly desiccated in situations where the relative humidity falls below the dew point.

Mesodon thyroidus is known to act as intermediate host to

Postharmostomum helicis (Leidy), a mouse fluke (Robinson, 1949), and *Eurytrema procyonis* Denton, a raccoon fluke (Denton, 1944), and is parasitized by the facultative protozoan *Colpoda steini* Maupas, a common free-living soil form (Burch, 1961).

Mesodon clausus (Say) Figs. 13, 16

Oklahoma Records: Craig County (Pilsbry and Ferriss, 1906a); Muskogee County (Pilsbry, 1940); Johnston and Pontotoc counties (Wallen, 1951); Pushmataha County (Wallen and Dunlap, 1953); Adair County (Dundee, 1955); Cherokee, LeFlore, Rogers and Sequoyah counties (Branson and Wallen, 1958). New Records: Bryan County.

Shell 9.5 to 13.2 mm high, diameter 13.6 to 18.2 mm; orthostrophic and globose-conoidal; hemiomphalous, but often nearly closed by reflected lip; 5⅓ to 5½ whorls separated by moderate sutures; color glossy chamois, yellowish-brown to tan; sculpture very similar to *M. thyroidus;* peristome narrowly reflected, nearly flat, forming a half-circle, its insertion on columella very narrow; animal similar to *M. thyroidus* in coloration and genitalia, but the penis bears a short partition proximally which becomes greatly enlarged and highly sculptured.

M. clausus is primarily a snail of wooded areas where it is found beneath decaying logs and other debris. It probably occupies all counties in eastern Oklahoma. It has a very long copulatory period (Webb, 1954).

Mesodon zaletus (Binney) Figs. 2, 5

Oklahoma Records: Ottawa and LeFlore counties (Pilsbry and Ferriss, 1906a); Cherokee County (Wallen, 1951); Adair County (Branson, 1958); McCurtain County (Branson and Wallen, 1959). New Records: Haskell and Delaware counties.

Shell 12.3 to 18.0 mm high, diameter 18.0 to 24.0 mm; orthostrophic and depressed-conoidal to globose-conoidal; always cryptomphalous; 5⅓ to nearly 6 whorls; sutures moderate; color glossy chamois to cinnamon brown; sculpture of very fine and evenly dispersed growth striae crossed by microscopic spiral lines, nucleus with fine radiating lines from the suture; peristome flatly and widely (nearly 3.0 mm wide) reflected, forming a lunate aperture, becoming narrow only near its upper insertion and bearing a low tooth-like keel near its lower insertion; tightly appressed over the umbilical region; a small to moderate oblique parietal tooth, nearer to upper lip than lower, is rarely lacking; foot grayish-white; mantle vividly marked by a very black reticulum which shows through the shell; spermatheca very slender.

The very weakly differentiated "race" *M. zaletus ozarkensis* (Pilsbry and Ferriss), type locality at Sugarloaf Mountain, LeFlore County, is not worthy of retention. It is separated from typical *M. zaletus* only by being smaller in size, but small individuals may be found throughout the range of the species.

M. zaletus is found in leaf-strewn, well-shaded habitats and is an obligate calciphile. Its mating habits are like those of the next species.

Mesodon elevatus (Say) Figs. 6, 9

Oklahoma Records: Muskogee County (Simpson, 1888; Wallen and Dunlap, 1953). New Records: Ottawa, Delaware and Cherokee counties in Oklahoma; in Missouri, McDonald and Stone counties.

Shell compact, 15.7 to nearly 20.0 mm high, diameter 19.6 to nearly

27.0 mm; high orthostrophic and globose-conoidal; always cryptomphalous; 5½ to 6 closely coiled whorls separated by deep sutures; color yellowish to olive-brown; tip of nucleus smooth, rest of it finely striate, other whorls marked by closely set growth striae crossed with microscopic, engraved, spiral lines; peristome fairly widely reflected, its upper one-third narrowed; lower lip bearing an elongated groove and thickened above, giving the appearance of a long tooth; parietal tooth oblique, entering and higher than that of any other *Mesodon;* animal dark brown above with darker tentacles; mantle light tan; foot grayish-white; penis length about 57 per cent of shell diameter.

M. elevatus is a very distinct and easily recognizable species which reaches its westernmost limits in Oklahoma. It apparently has a very inefficient method of penis exsertion which may allow some selfing to occur (Webb, 1954), as is to be expected if polyploidy is to be maintained.

Mesodon indianorum (Pilsbry) Figs. 3, 7, 10

Oklahoma Records: Pushmataha County (Pilsbry, 1899); LeFlore and Pushmataha counties (Ferriss, 1900); Creek County (Pilsbry, 1902); Pushmataha and LeFlore counties (Pilsbry, 1903); LeFlore, Pushmataha and Atoka counties (Pilsbry and Ferriss, 1906a); Cherokee, Love, McCurtain and Muskogee counties (Wallen, 1951); McCurtain County (Wallen and Dunlap, 1953); Latimer, Rogers and McCurtain counties (Dundee, 1955); Tulsa County (Lutz, 1949). These records also include those for *M. binneyanus* (Pilsbry, 1899).

Shell 8.5 to nearly 16.0 mm high, diameter 16.5 to 29.0 mm; orthostrophic and low depressed-conoidal; cryptomphalous, hemiomphalous or narrowly phaneromphalous; 5 to nearly 6 whorls; sutures moderate to deep; color chamois, yellowish to cinnamon brown, nearly always with a rusty resting mark and a canary-yellow streak behind the lip; nucleus with faint striae, rest of shell set with very closely-spaced growth striae giving the shell a glossy appearance, crossed by many microscopic spiral lines; aperture lunate; peristome evenly, but narrowly, reflected throughout, not becoming thin above; edentate; animal pale; penis much longer than diameter of shell.

As far as sculpture and condition of the umbilicus are concerned this species forms a sort of cline from the western Ozarks out onto the plains, almost continuous variation being present. It is also variable within a given population, nearly perfect series being obtainable with wide-open umbilicae to those completely closed; heavily striate to very finely so. Pilsbry's (1902) *M. indianorum lioderma* (Type, A. N. S. P. 83, 281, Red Fork, Creek County), when large series are observed, is untenable and should be suppressed as a named form. In a like manner *M. binneyanus* (Pilsbry) 1899, is probably nothing more than an upland form of *M. indianorum,* becoming larger in the hills and grading into typical *indianorum* in the flatter areas. I suggest that this species should be made a synonym of *M. indianorum* simply because of its regional denotation rather than the patronym.

Mesodon roemeri (Pfeiffer) Fig. 12

Oklahoma Records: none
New Records: 5 specimens, collected by Mr. S. Scates, University of Oklahoma Biological Station, Marshall County, 12 July 1954, average diameter 22.6 mm; height, 10.5 mm; 5 whorls.

Shell 10.0 to 13.0 mm high, diameter 18.0 to 24.0 mm; orthostrophic and low depressed-conoidal; cryptomphalous to narrowly hemiomphalous;

4½ to 5 whorls; sutures moderate; periphery of body whorl slightly carinated; glossy cinnamon to chamois in color; first half of nucleus smooth, rest weakly striate from suture; other whorls closely set with fine growth striae crossed with microscopic lines; peristome narrowly reflected except at upper insertion where it becomes straight, slightly dished; aperture lunate ;a small, white and slightly entering parietal tooth present (sometimes lacking); animal similar to *M. indianorum* except that penis is much shorter.

This record extends the known range of this species northward by about 75 air miles. It is a geminate species of *M. indianorum* and is most abundant in and around the Edwards Plateau region of central Texas. It is most often found under dead and decaying wood and leaves (Pilsbry, 1940) and is probably a calciphile. Since central Texas is connected to Oklahoma by a slight escarpment (in the Texan Biotic Province) small pockets of this snail may be found throughout the entire region.

Mesodon kiowaensis (Simpson) Figs. 1, 4

Oklahoma Records: Pittsburg (Kiowa, type locality), McIntosh and Atoka counties (Simpson, 1888); Atoka and McIntosh counties (Pilsbry and Ferriss, 1906a); Choctaw-McCurtain county line (Dundee, 1955).

Shell 7.5 to 9.0 mm high, diameter 14.5 to 16.2 mm orthostrophic and very low conoidal; phaneromphalous (umbilicus 9 times in diameter); 5 to 5½ whorls sutures rather deep, the body whorl being much narrower than in *M. indanorum* or *M. roemeri;* glossy cinammon or brown in color; parietal callus whitish; nucleus faintly striate, rest of shell sculptured by diagonal growth striae crossed by microscopic lines; periphery slightly carinated; peristome narrowly reflected except at upper insertion where it becomes thin and straight, purplish-white in color; aperture nearly round, but wider than high; living specimens not observed.

This species, which is the rarest of U.S. mesodons, is apparently very secretive as there are probably no more than 15 or 20 specimens available. One is in my collection, one in that of Dee Dundee, and the remainder in those of the U. S. National Museum and Philadelphia Academy of Sciences. Nothing is known of its biology.

Mesodon inflectus (Say) Fig. 14

Oklahoma Records: Muskogee County (Brown, 1861); Muskogee, Atoka and McIntosh counties (Simpson, 1888); Pushmataha County (Pilsbry, 1903); Ottawa and Atoka counties (Pilsbry and Ferriss, 1906a); Rogers County (Lutz, 1949); Cherokee and McCurtain counties (Wallen, 1951); Muskogee County (Wallen and Dunlap, 1953); Adair, Mayes, Sequoyah, Delaware and Choctaw counties (Dundee, 1955); Haskell and Pittsburg counties (Branson and Wallen, 1958); Wagoner County (Branson, 1959); "Oklahoma" (Archer, 1933).

Shell 5.0 to 8.3 mm high, diameter 8.3 to nearly 13.0 mm; orthostrophic and lenticular; cryptomphalous or very slightly hemiomphalous; 4½ to 5¾ slowly increasing, narrow whorls; sutures deep ;the last whorl is sharply deflected downward at its upper junction with the lip, behind which it is deeply guttered; nucleus faintly striate, rest of shell covered by exceedingly fine growth striae and small granules, some of the latter bearing fine hair-like extensions; periphery slightly carinated; pale brown to yellowish-brown in color; peristome reflected and thickened, except at upper margin where it is straight; outer lip bears a blunt tooth a short distance within; lower lip, near its edge, bears a pyramidal one, a U-shaped depression being formed between the two; parietal tooth sharp-edged

and originates near umbilical region from whence it curves strongly into aperture; animal very dark above, head and tentacles black; foot long and slender and grayish-white.

M. inflectus is found under decaying logs and occasionally rocks or fairly deep cover of leaves. Reproduction in this nocturnal species begins in late February or early March and continues into mid-summer. The eggs are laid one day following copulation and the young hatch in about two days (Archer, 1933).

The so-called subspecies *M. inflectus edentata* Sampson is found throughout the range of the species and is doubtless nothing more than an immature form since the labial armature is often lacking in young shells. The name should be suppressed.

Mesodon clenchi (Rehder) and *M. perigraptus* Pilsbry, especially the latter, should be sought in northeastern Oklahoma.

GENUS Polygyra Say, 1818

Shell lenticular to discoidal; mostly some shade of brown (one species has a peripheral reddish-brown band); solid to thin; peristome reflected and variously contracted to nearly round, bearing three teeth; variously sculptured; animal tan, grayish to very dark brown; penis without a sheath; jaw distinctly ribbed. Six species reported from Oklahoma.

KEY TO OKLAHOMA SPECIES OF POLYGYRA

1 a. Parietal tooth tongue-like or deeply entering 2
b. Parietal tooth inverted V-shaped 4

2 a. Parietal tooth somewhat folded and deeply entering 3
b. Parietal tooth square tipped and tongue-like; not deeply entering ..... *Polygyra dorfeuilliana*

3 a. Greatest diameter of shell less than 8.5 mm ..... *Polygyra jacksoni*
b. Greatest diameter of shell more than 9.0 mm ..... *Polygyra deltoidea*

4 a. Umbilicus nearly covered by reflected lip; diameter less than 6.5 mm; periostracum usually hairy ..... *Polygyra leporina*
b. Umbilicus not covered by reflected lip; diameter greater than 6.5 mm; periostracum smooth or nearly so ..... *Polygyra texasiana*

Polygyra texasiana (Moricand) Figs. 25, 26

Oklahoma Records: McIntosh and Pittsburg counties (Simpson, 1888); Sequoyah County (Sampson, 1891); Cleveland and Atoka counties (Pilsbry and Ferriss, 1906a); Payne, Comanche and Pottawatomie counties (Walker, 1915); Payne County (Greger, 1915); Washington, Tulsa, Oklahoma, Grady and Beckham counties (Lutz, 1949); Blaine, Cherokee, Johnston, LeFlore, Murray, Pawnee, Pittsburg and Pontotoc counties (Wallen, 1951); Caddo, Canadian, Cotton, Grant, Greer, Kay, Kiowa, Love, McCurtain, Noble, Tillman and Woodward counties (Wallen and Dunlap, 1953); Rogers, Mayes and Hughes counties (Dundee, 1955); Bryan, Choctaw, Creek, Haskell, Osage, Pottawatomie and Roger Mills Counties (Branson and Wallen, 1958); Nowata County (Branson, 1959). New Records: Alfalfa, Garvin and Marshall counties.

Shell 5.0 to 6.6 mm high, diameter 8.7 to 13.0 mm, orthostrophic and lenticular; narrowly phaneromphalous; 5 to 5½ slowly increasing whorls; sutures rather deeply incised; periphery rounded; horn to brown, lighter below than above; a pale orangish-brown band at periphery present or not; embryonic whorls faintly striate at suture or completely smooth; other

whorls progressively more rib-striate or nearly smooth; base nearly smooth to as nearly heavily striate as above; peristome white, forming nearly two-thirds a circle, reflected and thickened; two lip teeth, one on outer lip and one on basal lip, the upper one having a slight ridge above it and separated from the lower one by a U- or V-shaped notch; the parietal tooth, although quite variable, is always an inverted "V"; animal quite light, although slightly darker above; sometimes yellowish-brown.

P. texasiana is found both in woodlands and grasslands, normally under fallen wood, rocks or other structures lying on the soil . However, it is very much more abundant in the grasslands of the Texan and Kansas Biotic provinces than elsewhere.

The form termed *Polygyra triodontoides* (Bland) (Pilsbry, 1940) is found in most of the range *P. texasiana,* of which it has been called a subspecies, and is nothing more than a variant of the latter form.

Polygyra tamaulipasensis Lea is a form recently elevated to full-species level by Hubricht (1961). His reasons for so doing were as follows: the shell is never banded and is more depressed than *P. texasiana;* the whorls are more narrow, the parietal tooth is a little longer and the animal is pale gray rather than brownish-yellow. All of these are characteristics which demonstrate considerable variation in *P. texasiana.* In Oklahoma and Texas, clones can be found matching exactly these characters but the shell is banded. Furthermore, the color of the animal changes from one kind of soil to another and with the time of the year. *Polygyra tamaulipasensis* should be, in my estimation, suppressed, along with *P. texasiana texasiana* Pilsbry, a name it supposedly supplants.

Two other species, *Polygyra scintilla* Pilsbry and Hubricht, 1956, a southwestern Texas form, and *Polygyra polita* Pilsbry and Hinckley, 1907, a Mexican species, are also probably nothing more than variants of the very widespread *P. texasiana* and should be added to the synonymy of that species.

Some insight into such variable species can be gleaned by observation of their habits. All terrestrial snails have a tendency to form clone colonies, i. e., a single large rock may have 200 or more specimens under it derived from a single original one. This allows semi-isolated gene pools to develop, all of the individuals thus involved differing somewhat from other such groups. In a variable species like *P. texasiana* the types possible throughout its range are difficult to estimate. Whatever the case, it is not surprising that a number of these might be called "species", nor is it surprising that in beach drift material that there should be very little overlap between the various types. They could have been washed in from miles away.

When collecting in western Oklahoma one should attempt to recognize some very-well preserved late Cenozoic specimens of *Polygyra rexroadensis* Taylor (1960), which somewhat resemble the smoother forms of *P. texasiana.* The form has well-developed spiral striae on the last whorl and the upper arm of the parietal tooth is longer than the lower one; in *P. texasiana* the reverse is true.

Polygyra leporina (Gould) Fig. 24

Oklahoma Records: Muskogee, Atoka and McIntosh counties (Simpson, 1888); LeFlore and Pushmataha counties (Pilsbry, 1903); Cherokee and Johnston counties (Wallen, 1951); McCurtain County (Wallen and Dunlap, 1953); Wagoner, Mayes and Bryan counties (Dundee, 1955); Creek, Haskell, Ottawa and Sequoyah counties (Branson and Wallen, 1958). New Records: Marshall and Choctaw counties.

Shell very small, 2.7 to 3.8 mm high, diameter 5.0 to 6.5 mm; orthostrophic and orbiculolenticular; almost cryptomphalous; 4½ to 5½ narrow whorls; the last one depressed at the aperture; sutures progressively more incised; periphery rounded; horn, yellowish-brown to brown in color; first ½ whorl smooth, the next whole whorl with very faint striae, the remainder of the shell being weakly and closely growth-striate; some tiny, widely-spaced papillae; the young, and a few adults, bear weak periostracal hairs; peristome white and narrowly reflected, strongly dished; outer lip bears a small, pyramidal, slightly receding tooth; basal lip with a rather strong ridge-like tooth extending toward the umbilical region; parietal tooth V-shaped and thin, its basal portion being much longer and higher than upper; animal yellowish or grayish-brown; penis very short, about ⅛ the diameter of shell.

P. leporina is a snail of damp and marshy areas, being found under leaf mold and dead and decaying wood, into which it sometimes bores.

Polygyra jacksoni (Bland) Fig. 28

Oklahoma Records: Muskogee County (Bland, 1866) (type locality, Fort Gibson); Muskogee and Atoka counties (Simpson, 1888); LeFlore County (Ferriss, 1900); LeFlore County (Pilsbry, 1903); Ottawa, Muskogee and LeFlore counties (Pilsbry and Ferriss, 1906a); Washington Countf (Lutz, 1949); Sequoyah and LeFlore counties (Wallen, 1951), Adair County (Branson and Wallen, 1958); Cherokee County (Branson, 1959). New Records: Mayes County.

Shell 3.0 to 4.0 mm high, diameter 6.1 to 8.2 mm; orthostrophic and depressed-lenticular; 5½ to 6 narrowly increasing whorls, the last one becoming suddenly deflected downward; sutures deep; periphery slightly angulated on upper edge; glossy pale to dark horn in color; a tiny umbilicus penetrates between the tightly-coiled whorls; apex nearly smooth, rest of shell weakly-marked by growth striae which barely cross over onto the base, the latter being nearly smooth; peristome forms about ⅔ of a circle, but is wider than high, is narrowly reflected and thickened within, varies from white to reddish-white, both insertions adnate to body whorl; parietal callus thick and opaque; upper lip tooth a small transverse ridge very deeply placed; lower lip tooth thin, ridge-like and entering aperture from near columella; parietal tooth bicrural, its two rami joining to form a very thin blade-like apex that enters deeply; tubercle lacking on internal columella; animal very light.

P. jacksoni inhabits the tops of limestone hills and is usually found under stones covering moist soil. Nothing is known of its reproductive habits or of its soft anatomy.

Polygyra deltoidea (Simpson) Figs. 29, 30

Oklahoma Records: Muskogee County (Simpson, 1888); (lectotype, Pilsbry, 1940, A. N. S. P. 11048); Ottawa and Muskogee counties (Pilsbry and Ferriss, 1906a); Pittsburg and Atoka counties (Lutz, 1949); Sequoyah County (Wallen, 1951); Delaware County (Branson and Wallen, 1958); Cherokee County (Branson, 1959). New Records: Wagoner County.

Shell 3.6 to 5.0 mm high, diameter 7.6 to 10.2 mm; orthostrophic and orbiculoid-lenticular, the periphery being somewhat more carinated than in *P. jacksoni;* 5½ to 6 whorls, the last one sharply deflected, more so than in *P. jacksoni*, near the aperture; sutures deeply incised; color varies from light to dark horn; nucleus very faintly striate from sutures, the rest of the upper surface progressively more coarsely sculptured, attaining rib-striation behind the lip; base nearly perfectly smooth; anomphalous to

very narrowly phaneromphalous; peristome strongly reflected, thickened within and flanged behind, a lunate, smooth area demarking it from the rest of the shell behind, forming about ¼ a circle, only slightly, if any, wider than high, its color very light brownish-white, the teeth being white; lower lip insertion as in *P. jacksoni* but that of upper differs in not being adnate to the body whorl but being lifted above it, forming a slight notch at that junction; parietal callus lacking; upper lip tooth very deeply and diagonally placed (scarcely seen from an apertural view), being connected within, and at right angles to, a small plate-like tubercle, a small U-shaped dent partially separating them, the whole complex being rather sigmoid in shape (does not occur in *P. jacksoni);* lower lip tooth as in *P. jacksoni,* but unlike the latter, is much thicker; parietal tooth bicrural, the two rami being equal in length and truncated, rather than blade-like, at the point where it curves into aperture; soft anatomy unknown.

Polygyra deltoidea has been considered as a subspecies of *P. jacksoni* (Pilsbry, 1940). However, there is no overlap in characters and the species ecology is different, *P. deltoidea* being a form of wooded slopes. After evaluating several hundred specimens, many of which are topotypes, this form is elevated to full species rank. The form *P. jacksoni simpsoni* Pilsbry and Ferriss is a variant and should be placed in the synonymy of *P. deltoidea.* The name *simpsoni* dates from 1907, whereas *deltoidea* was described in 1889. Consequently, the latter clearly has priority over the former.

Polygyra dorfeuilliana (Lea) Fig. 27

Oklahoma Records: Muskogee, Atoka and McIntosh counties (Simpson, 1888); Pushmataha County (Ferriss, 1900); McIntosh, Latimer and LeFlore counties (Pilsbry, 1903); Ottawa, Muskogee, Creek, McIntosh, LeFlore, Latimer, Atoka and Pittsburg counties (Pilsbry and Ferriss, 1906a); Cherokee, Creek, Johnston, Love, McCurtain and Pontotoc counties (Wallen, 1951); Choctaw County (Dundee and Dundee, 1958); Adair, Bryan, Delaware, Haskell, Hughes, Kay, Oklahoma, Osage, Payne and Sequoyah counties (Branson and Wallen, 1958); Nowata, and Pawnee counties (Branson, 1959). New Records: Carter and Marshall counties.

Shell 3.4 to 4.5 mm high, diameter 7.7 to 10.0 mm; orthostrophic and plano-convex (base-apex); upper periphery somewhat angulated; 5 to 5½ whorls; sutures deeply incised; glossy horn, chamois or nut-brown in color; nucleus very weakly striate at suture, the striae becoming progressively stronger on rest of shell, attaining rib-striation above on the last 1½ whorl; base varies from smooth to nearly as heavily striate as upper surface; anomphalous to narrowly phaneromphalous; peristome faintly brown, teeth white, and narrowly reflected and somewhat thickened within, forming about ¾ of a circle, but slightly wider than high; outer lip tooth less immersed than basal about the same size and shape; parietal callus lacking; parietal tooth, somewhat variable, usually tongue-like, truncate aperturally, grooved centrally and rather obliquely placed; a small tubercle located on columella approximately ¼ of a whorl inward; soft anatomy unknown.

P. dorfeuilliana is considerably variable as sculpture, size and umbilical characters are concerned. Specimens with the characters of the various "subspecies" can be found throughout the range of the species and thus are largely imaginary. *P. d. sampsoni* Wetherby and *P. d. perstriata* Pilsbry and Ferriss should both be relegated to the synonymy of *P. dorfeuilliana.*

Bland (1866) reported *P. auriformis* (Bland) from Fort Gibson.

However, the range of this species lies many miles south of Oklahoma. This record was probably based on an abnormal specimen of *P. deltoidea*. See Figure 23 for comparison.

GENUS *Stenotrema* Rafinesque, 1819

Shell of moderate size, globose-conic to lenticular and moderately heavy; whorls closely applied with only moderate sutures; aperture entirely basal; parietal tooth moderately developed to long, thin and strongly curved; inner edge of outer and basal lip buttressed and notched or not; cryptomphalous to narrowly phaneromphalous; yellowish brown to brown, the periostracum often bearing short, hair-like processes; animal generally like *Polygyra* but female genitalia eversible (Webb, 1947). Four species reported from Oklahoma, but one is placed in the synonymy of *S. leai*.

KEY TO OKLAHOMA SPECIES OF STENOTREMA

1 a. Outer and lower lip buttressed and notched 2
b. Outer and lower lip neither buttressed nor notched ..... *Stenotrema leai*

2 a. Periphery angled; shell nearly smooth ..... *Stenotrema labrosum*
b. Periphery rounded; shell granulose, often with short hair-like processes ..... *Stenotrema stenotrema*

Stenotrema labrosum (Bland) Figs. 32, 33

Oklahoma Records: LeFlore County (Pilsbry and Ferriss, 1906a); Adair and McCurtain counties (Dundee, 1955). New Records: Delaware, Cherokee and Wagoner counties, the latter being the westernmost record for the species.

Shell 6.0 to 7.1 mm high, diameter 10.5 to nearly 13.0 mm; orthostrophic and bilenticular, the periphery being sharply angulated; 5 to 5½ slowly increasing whorls which are nearly flat above; sutures weakly incised; anomphalous; rather glossy nut-brown in color; nucleus weakly punctate, the remaining whorls possessing very closely approximated and interrupted striae; base very smooth and marked only by microscopic striae and indistinct spiral lines; peristome narrowly reflected; outer lip nearly form a right angle with basal; teeth and lip pale brownish-white; aperture very narrow; a thin ridge extends from within to angle between outer and basal lips, the latter bearing a strong buttress notched near its center; parietal tooth very long, high, and blade-like, curving into aperture; little known concerning soft parts.

S. labrosum is usually found under rocks and decaying wood where moisture and fungi are plentiful.

Stenotrema stenotrema (Pfeiffer) Fig. 31

Oklahoma Records: Muskogee County (Simpson, 1888); Ottawa and Muskogee counties (Pilsbry and Ferriss, 1906a); Cherokee and McCurtain counties (Wallen, 1951); Adair and Sequoyah counties (Branson and Wallen, 1958).

Shell, 5.2 to 8.5 mm high, diameter 8.0 to nearly 13.0 mm; orthostrophic and globose-lenticular, the spire being much more elevated than in *S. labrosum;* periphery rounded or only slightly angulated; 5 to nearly 6 convex whorls; sutures moderate; anomphalous; dull brown to cinnamon-brown in color; nucleus weakly striate, rest of shell with fine growth striae and fine papillae and often periostracal hairs; base finely papillose and hairy; peristome slightly more widely reflected than in *S. labrosum* and of about the same color; labial armature similar to that of *labrosum;*

animal brownish-white above; foot grayish white; penis length ¾ or more of shell diameter; female genitalia somewhat swollen.

S. stenotrema is a snail of wooded ravines where it frequents leaf mold, decaying logs, and the under side of stones.

Stenotrema leai Ward Figs. 34, 35

Oklahoma Records: Atoka and McIntosh counties (Simpson, 1888); Pushmataha County (Pilsbry, 1903); Ottawa, Craig, LeFlore, Pittsburg and Atoka counties (Pilsbry and Ferriss, 1906a); Payne County (Walker, 1915; Greger, 1915); Cleveland, Comanche, McClain, Beckham and Murray counties (Lutz, 1949); Blaine, Cherokee, Cleveland, Johnston, Kay, Logan, Muskogee, Osage, Pawnee, Payne, Pontotoc and Woodward counties (all as *S. fraternum imperforatum* Pilsbry) (Wallen, 1951); Canadian, Garfield, Grady, Kingfisher, Lincoln, Love, McCurtain, Noble and Woodward counties (Wallen and Dundap, 1953); Harper County (Pleistocene, *S. leai leai)* (Taylor and Hibbard, 1955); Adair, Cherokee, Rogers, Delaware, Coal and Hughes counties (Dundee, 1955); Choctaw, Creek, Haskell, Mayes and Pottawatomie counties (Branson and Wallen, 1958); Washington, Pawnee and Johnston counties (Branson, 1959.) New Records: Alfalfa, Pontotoc, Marshall, Garvin and Bryan counties.

Shell 5.0 to 7.5 mm high, diameter 7.3 to 10.0 mm; orthostrophic and globose-lenticular; periphery slightly angulated; 5¾ to 6 convex, slowly increasing whorls; sutures moderate; cryptomphalous to phaneromphalous; glossy yellowish-brown to horn in color; nucleus with very fine striae, rest of shell very closely set with growth striae and tiny papillae giving rise to very short hair-like processes, adult shells usually retaining only papillae; brownish-white or white peristome narrowly reflected and slightly scooped, the basal portion often bearing a low ridge-like callosity; parietal tooth fairly high, very thin and variable in length, extending sometimes from the axis, often falling short of it by ⅓ its length; soft anatomy very little known.

Stenotrema leai is quite a variable species as witnessed by 32 specimens collected at Tishomingo, Johnston County. Three of them lack parietal teeth; 24 are cryptomphalous, 5 are hemiomphalous and 2 are phaneromphalous. The width of the whorls, a character used by Pilsbry (1900) to distinguish *S. fraternum imperforatum* from *S. leai,* varies from 8 to 10 times in the diameter of the shell. The name *S. fraternum imperforatum* should be added to the synonymy of *S. leai aliciae* (Pilsbry), which may or may not be a valid race. The *stenotrema fraternum-leai-monodon* complex should be completely evaluated to determine whether all of these forms are conspecific.

In Oklahoma *S. leai* seems to prefer moist hillsides and stream margins, as found by Leonard (1959) in Kansas. This species is also infected by the protozoan *Colpoda steini* (Burch, 1961).

Simpson (1888) reported *Helix altimata* from Fort Gibson, probably based upon an elevated specimen of *S. leai.*

GENUS *Triodopsis* Rafinesque, 1819

Shell moderate to capacious, carinate-lenticular to globose-conic; glossy or dull tan or chamois to brown; glabrous to hirsute; heavily striate above and below to nearly smooth throughout; cryptomphalous to widely phaneromphalous; aperture lunate or sublunate and with three or no teeth; animal as in *Polygyra* except penis as least partially covered by a sheath; flagella lacking. Four species reported from Oklahoma.

KEY TO OKLAHOMA SPECIES OF TRIODOPSIS

1 a. Shell phaneromphalous; aperature with three teeth 2
b. Shell cryptomphalous; aperature edentate or with a tooth-like modification in basal lip 3

2 a. Umbilicus about as wide as widest part of next to last whorl; diameter of adult shell less than 8.5 mm ..... *Triodopsis vultuosa cragini*
b. Umbilicus about as wide as combined widths of third from and next to last whorls; diameter of adult shell greater than 9.0 mm ..... *Triodopsis neglecta*

3 a. Diameter of adult shell usually greater than 25.0 mm; height 15.0 mm or more; penis sheath relatively thin ..... *Triodopsis albolabris*
b. Diameter 22.0 or fewer mm; height 13.0 or less mm; penis sheath thick ..... *Triodopsis divesta*

Triodopsis neglecta (Pilsbry) Fig. 17

Oklahoma Records: Ottawa County (Pilsbry and Ferriss, 1906a); Muskogee and Payne counties (Wallen, 1951); Creek and Osage counties (Branson and Wallen, 1958). New Records: Delaware, Cherokee and Adair counties.

Shell 4.5 to 6.8 mm high, diameter 9.8 to 13.0 mm; orthostrophic and very depressed-conoidal; periphery rounded; 5 to 5½ narrow whorls; sutures moderate; widely phaneromphalous, all whorls being visible in the umbilicus, which is contained about 4 times in greatest shell diameter; glossy tan or light yellowish-borwn in color; nucleus with short spiral lines below suture, rest of shell heavily thread-striate above and below; peristome white, thick and fairly widely reflected; parietal callus thin; outer lip tooth square-tipped and receding inwardly, clearly visible from a basal view; lower lip tooth tubercle-like and situated near edge of lip, a U-shaped notch separating it from upper; parietal tooth begins at columella and strongly curves inward toward outer lip tooth (*T. fraudulenta*, an eastern form, Figs. 19 and 20, is illustrated for comparison; *T. neglecta* may be only the western counterpart of this species); soft parts unknown.

T. neglecta is most often found under deeply-placed logs or stones during the hot summer, colder parts of the winter, and during the day. At night, especially on rainy ones, it is often collected from leaf mold or the sides of large moss- or algal-covered stones.

Triodopsis vultuosa cragini Call Fig. 21

Oklahoma Records: Pittsburg County (Simpson, 1888); Pushmataha County (Pilsbry, 1903); Craig, Creek, Pittsburg and Choctaw counties (Pilsbry and Ferriss, 1906a); Oklahoma, Muskogee and Tulsa counties (Lutz, 1949); LeFlore, Mayes, Coal, Okmulgee, Hughes and Latimer counties (Dundee, 1955). New Records: Payne and Cherokee counties.

Shell 4.5 to nearly 8.0 mm high, diameter 8.2 to 8.6 mm; orthostrophic and depressed-conoidal; periphery rounded; 5 to 5½ whorls; sutures moderate; narrowly phaneromphalous, only last two whorls being clearly visible in the umbilicus (contained 6 or more times in shell diameter); glossy reddish-tan to yellowish-brown in color; nucleus smooth, rest of shell with very fine growth striae, coarsest behind lip; and incomplete spiral lines; base nearly lacking spiral striation; aperture subquadrate to lunate; white peristome narrowly refelected, bearing a receding triangular to subtriangular tooth in the outer lip, clearly visible from a basal view; basal tooth small, tuberculated and situated near inner edge of basal lip; parietal

tooth blade-like, only very slightly curved and scarcely reaching columellar region; soft anatomy unknown.

This species is more resistant to dry conditions than any other Oklahoma polygyrid except *P. texasiana*. It seems to prefer sandy soil in wooded regions where it is most often fund under rocks. *T. cragini* has been considered as a distinct species, but in northern Louisiana, southeastern Oklahoma and northeastern Texas there is so much overlap with the characters of *T. vultuosa* that it is herein considered as indistinguishable from that species. However, it probably can be considered as a geographical race. If it is so considered, its range would include all of western Arkansas, southeastern Kansas, eastern and southeastern Oklahoma, northeastern Texas and northwestern Louisiana. *Triodopsis vultuosa henriettae* (Mazyck) and *T. v. copei* (Wetherby) are considered as synonyms of *T. vultuosa vultuosa* (Gould), which ranges from southcentral Arkansas through central and southern Louisiana into east-central Texas at least as far west as Galveston.

Triodopsis albolabris (Say) Figs. 15, 18

Oklahoma Records: Pushmataha County (Ferris, 1900); Pushmataha County (Pilsbry, 1903); Ottawa and LeFlore counties (Pilsbry and Ferriss, 1906a); Muskogee County (Lutz, 1949); Cherokee County (Wallen, 1951); McCurtain County (Wallen and Dunlap, 1953); Mayes, Delaware and McCurtain counties (Dundee, 1955); Adair County (Branson and Wallen, 1958). New Records: Wagoner County.

Shell 16.0 to 19.0 mm high, diameter 25.0 to 32.0 mm; orthostrophic and depressed-globose; periphery rounded; 5¼ to nearly 6 whorls; sutures deeply incised; body whorl rapidly enlarging; always cryptomphalous; matt cream to chamois in color; nucleus with a narrow band of spiral striae below suture, rest of shell with fine oblique growth striae and microscopic spiral lines; aperture lunate and edentate; peristome widely reflected and somewhat rounded, being notched near its basal insertion causing a very low tooth-like thickening to appear in basal lip; penis sheath thick but thinner than that of next species, its internal surface densely covered by papillae (Pilsbry, 1940); spermatheca somewhat swollen and club-like;mantle with small grayish blotches.

T. albolabris, our largest polygyrid, seems to prefer damp stony areas where there is an abundance of small fungi. According to Pilsbry and Ferriss 1906a), the abundance of the fungi determines the shell size. The western representatives of this species, including those of our Ozarkian region, supposedly comprise a distinct race, *P. albolabris alleni* (Wetherby), but I have no comparative materials to validate or invalidate the latter.

Triodopsis divesta (Gould) Fig. 22

Oklahoma Records: Muskogee, McIntosh and Atoka counties (Simpson, 1888); Pushmataha County (Ferris, 1900); Muskogee County Pilsbry and Ferriss, 1906a); Rogers County (Lutz, 1949); Delaware, McCurtain and Pushmataha counties, (Wallen, 1951); Cherokee County (Wallen and Dunlap, 1953); Adair and Latimer counties (Dundee, 1955); Sequoyah County (Branson and Wallen, 1958). New Records: Craig, Ottawa, Mayes, Wagoner and LeFlore counties.

Shell 8.5 to nearly 14.0 mm high, diameter 13.5 to nearly 21.0 mm; orthostrophic and very depressed-globose (reminiscent of *M. indianorum*); periphery rounded; 4½ to 5½ whorls; sutures deeply incised; always cryptomphalous; dull cream to chamois in color with one or two reddish-brown streaks indicating positions of previous apertures; nucleus smooth except an area of very fine striae below the suture; rest of shell with very

fine growth striae; aperture edentate and lunate; white peristome narrowly and almost evenly reflected except for a very short area at upper insertion where it becomes straight; basal lip slightly notched near columellar insertion; mantle sparsely blotched with light gray; penis length equal to about 26 per cent of shell diameter, its sheath being very thick.

T. divesta is another forest snail, being found under dead trees, heavy forest litter and rocks.

FAMILY BULIMULIDAE

Shell capacious, opaque brownish-gray or gray streaked longitudinally with brownish or gray markings; oblong-conic and dextral; narrowly hemiomphalous; whorls nearly smooth with faint, closely-spaced growth striae, sutures deply incised; peristome thin and sharp-edged, slightly reflected near columella; inside aperture gray or brown; columella sometimes with a small tooth-like plait; jaw striated; central radular tooth tri-or bicuspid; animal light gray or brown; foot white or yellowish-white; penis slender and enveloped by moderate sheath. One genus.

GENUS Bulimulus Leach, 1815

With characters of family.

KEY TO OKLAHOMA SPECIES OF BULIMULUS

1 a. Inside of aperture brown; a small tooth-like plait on columella ..... *Bulimulus alternatus*

b. Inside of aperture gray; columellar portion straight ..... *Bulimulus dealbatus*

Bulimulus dealbatus (Say) Figs. 36, 37

Oklahoma Records: Muskogee and Atoka counties (Simpson, 1888); Atoka County (Pilsbry and Ferriss, 1906b); Washington, LeFlore, Pushmataha, Johnston, Marshall, Murray and Love counties (Lutz, 1949); Blaine, Muskogee, Pawnee, Payne and Pontotoc counties (Wallen, 1951); McCurtain County (Wallen and Dunlap, 1953); Cherokee, Sequoyah, Tulsa, Mayes, Choctaw and Bryan counties (Dundee, 1955); Choctaw County (Dundee and Dundee, 1958); Nowata, Latimer and Murray counties (Branson, 1959); Adair, Haskell, Hughes, and Osage counties (Branson and Wallen, 1958). New Records: Comanche and Carter counties.

Shell thin, 17.0 to 26.8 mm high, diameter 9.3 to 15.7 mm; orthostrophic, globose- or straightly-conic; 6 to 6½ whorls; sutures deeply incised; rimate, hemiomphalous; gray and profusely longitudinally streaked by gray or brownish-gray markings; inside of aperture gray; sculpture of very fine growth striae to almost rib-striate in southern Oklahoma and into Texas; aperture much higher than wide, reflected only near columella; lip sharp; columella straight, edentate; animal pale gray with yellowish foot; aestivates and hibernates beneath soil or under rocks.

In studying large series of *Bulimulus dealbatus* collected from Kansas southward into central and southcentral Texas several points become obvious. The grayish mottling gradually changes to brownish and the bands are wider, although gray forms are found throughout the range. Secondly, the sculpture becomes coarser and the shells progressively increase in size from the north southward. Shells collected from hills or low mountains also have much narrower shells than those collected from the plains or bases of the elevations. Consequently, samples taken from here and there throughout the range of the species might, as apparently

has been true, form the basis for subspecies descriptions. *B. dealbatus* is a very widespread and plastic species and in all probability is capable of varying according to edaphic, climatic, and nurture conditions under which it finds itself. Furthermore, various U. S. species of *Bulimulus* can hybridize (Hubricht, 1960; Webb, 1951), doubtlessly introducing variability and allowing for intermediate physiological adaptation. The latter would, of course, obscure the taxonomy of the group because the hybrids would often occupy habitats intermediate to those of the parental stock and appear to be new varieties or even species.

In the opinion of this worker, since those forms can be found through most of the Oklahoma—adjacent Texas region, *Bulimulus dealbatus liquabilis* (Reeve) and *B. d. ozarkensis* Pilsbry and Ferriss are not worthy of retention and should be placed in the synonymy of *B. dealbatus*. *Bulimulus dealbatus ragsdalei* (Pilsbry), although Hubricht (1960) suggests that it may be a full species, should also be thoroughly investigated to determine its status.

Bulimulus alternatus Binney (see Part I, Fig. 5)

Although the range of this species is in southcentral and southwestern Texas and adjacent Mexico, it was included in the key because someone, possibly a tourist, introduced a small colony into Love County (Branson, 1959). The fate of this colony is unknown.

CONCLUDING REMARKS

A great deal of work remains to be done with the polygyrids. Very little is known of their natural history, physiology, genetics and soft anatomy. Any one of these problems could form the basis for a doctoral or master's thesis.

The remainder of the terrestrial Mollusca will be treated in three sections. Part V will consider the Valloniidae, Achatinidae and Succineidae; Part VI, the Endodontidae and Zonitidae; and Part VII, the Philomycidae, Limacidae, Arionidae, and Veronicellidae. It is requested that anyone collecting slugs from nature or in greenhouses, especially in the western part of the state, please send these to me.

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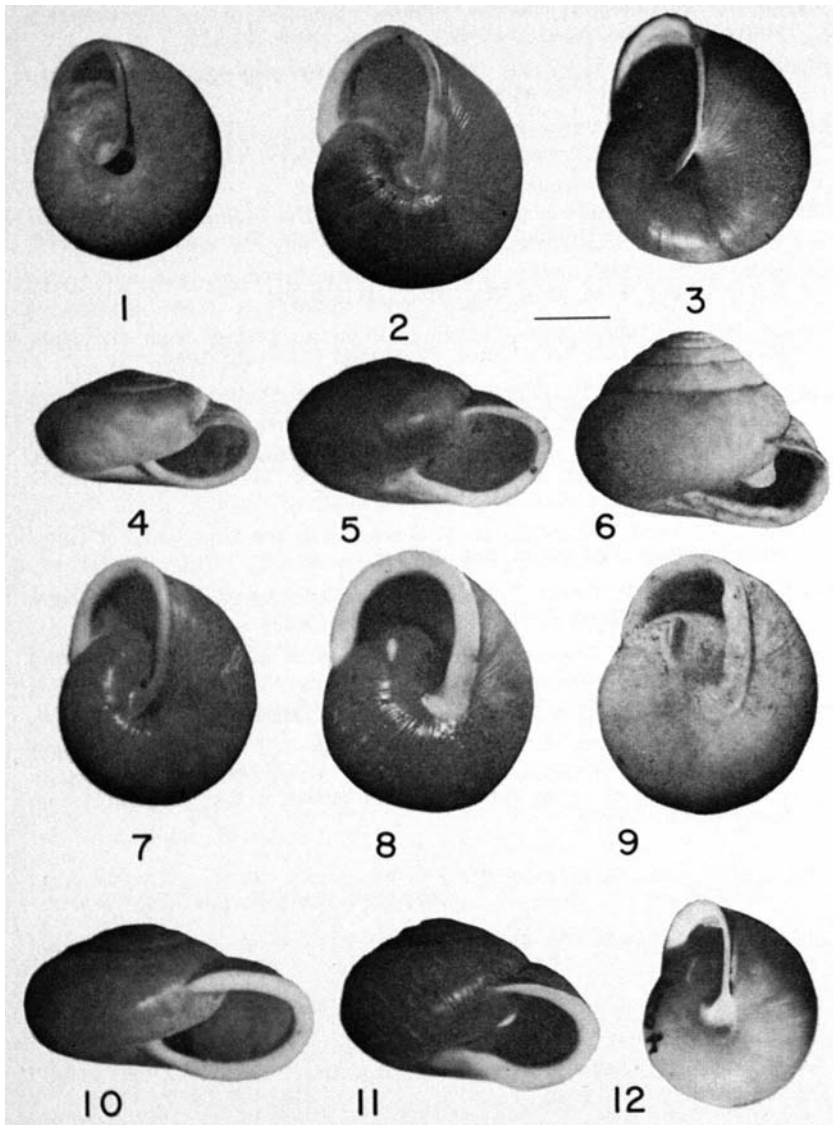

Fig. 1. *Mesodon kiowaensis*
2. *Mesodon zaletus*
3. *Mesodon indianorum (=binneyanus)*
4. *Mesodon kiowaensis*
5. *Mesodon zaletus*
6. *Mesodon elevatus*
7. *Mesodon indianorum*
8. *Mesodon thyroidus*
9. *Mesodon elevatus*
10. *Mesodon indianorum*
11. *Mesodon thyroidus*
12. *Mesodon roemeri*

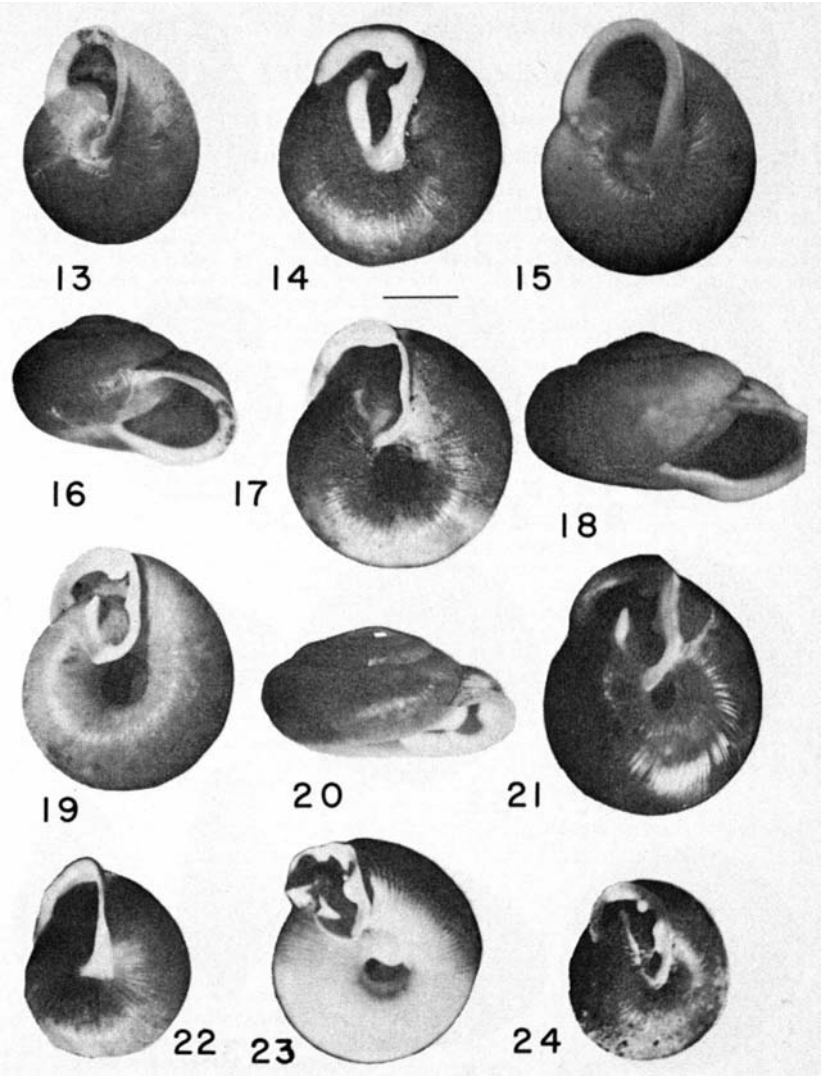

Plate II. Scale line=5.0 mm.

Fig. 13. *Mesodon clausus*
14. *Mesodon inflectus*
15. *Triodopsis albolabris*
16. *Mesodon clausus*
17. *Triodopsis neglecta (edentula)*
18. *Triodopsis albolabris*
19. *Triodopsis fraudulenta*
20. *Triodopsis fraudulenta*
21. *Triodopsis vultuosa cragini*
22. *Triodopsis divesta*
23. *Polygyra auriformis*
24. *Polygyra leporina*

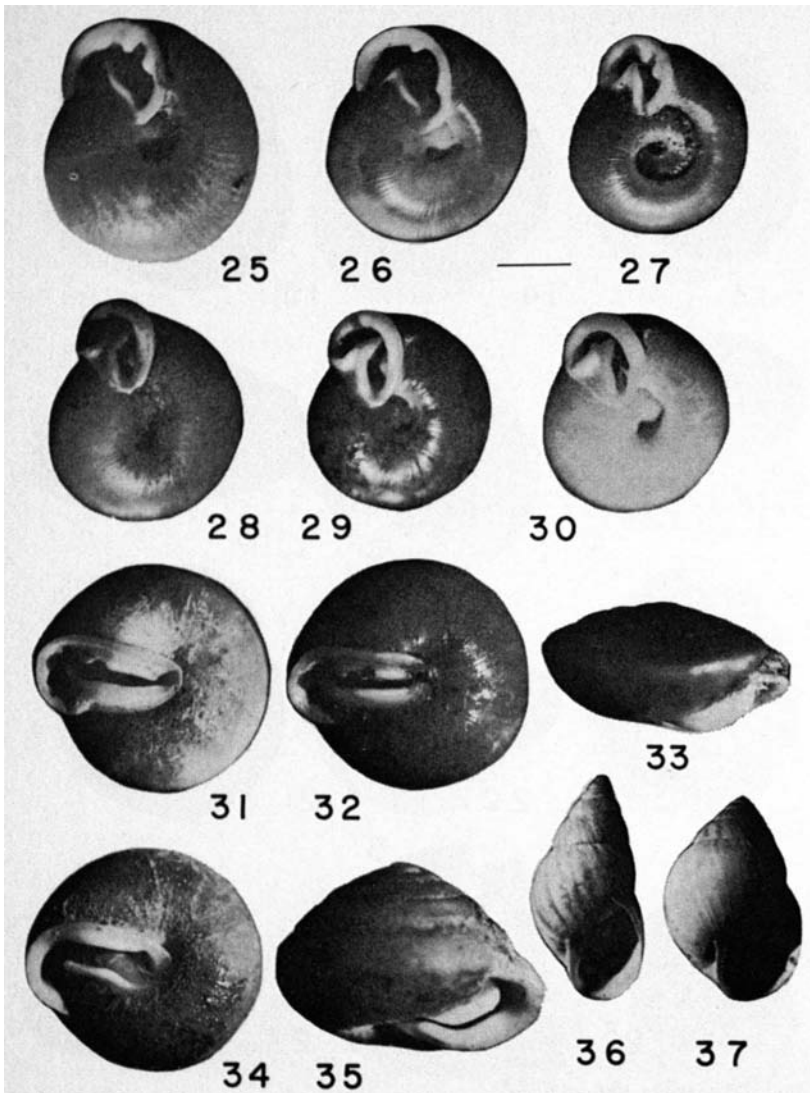

Plate III. Scale line=5.0 mm.

Fig. 25. *Polygyra texasiana*
26. *Polygyra texasiana (=triodontoides)*
27. *Polygyra dorfeuilliana*
28. *Polygyra jacksoni*
29. *Polygyra deltoidea*
30. *Polygyra deltoidea (=P. jacksoni simpsoni)*
31. *Stenotrema stenotrema*
32. *Stenotrema labrosum*
33. *Stenotrema labrosum*
34. *Stenotrema leai*
35. *Stenotrema leai*
36. *Bulimulus dealbatus (ozarkensis)*
37. *Bulimulus dealbatus*